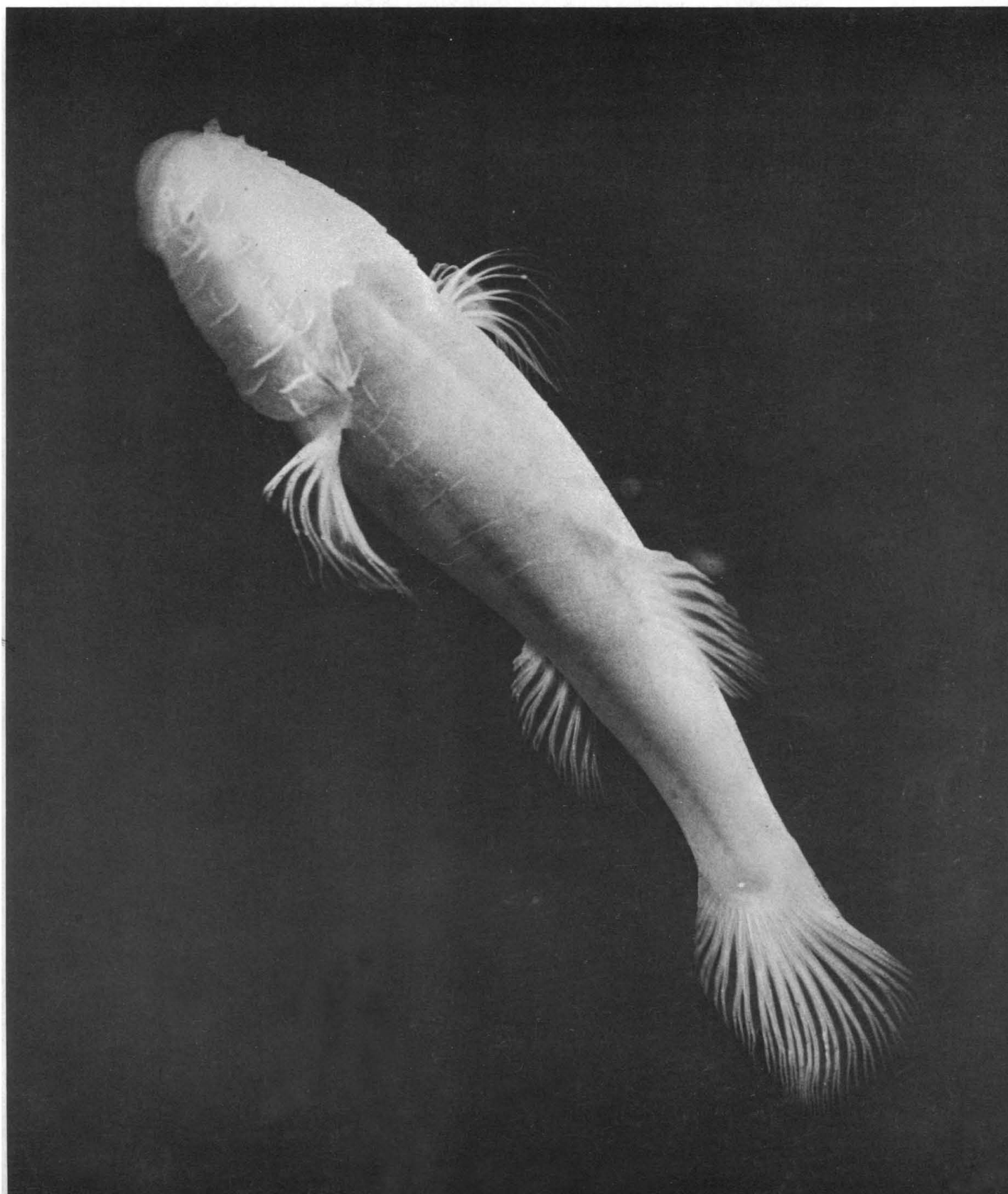


# SCIENCE

5 September 1969

Vol. 165, No. 3897

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



In our laboratory we use it both as a centrifuge and an ultracentrifuge. It handles two liters of sample at low speeds, and by changing rotors, we can separate and refine at up to 272,000 *g* — enough force to spin down viruses and sub-cellular particles. It takes the biggest Beckman rotors, including zonals. And it's so quiet, you can barely hear it running. That's a good thing, too, because at \$5,500 the L3-40 is such a good value we're liable to have lots more around here. For information, write Beckman Instruments, Inc., Spinco Division, 1117 California Ave., Palo Alto, California 94304. Ask for Bulletin SB-343.

**Talk about covering the 15,000  
to 40,000 rpm range!**

**The L3-40 does it.**

**Beckman®**  
INSTRUMENTS, INC.

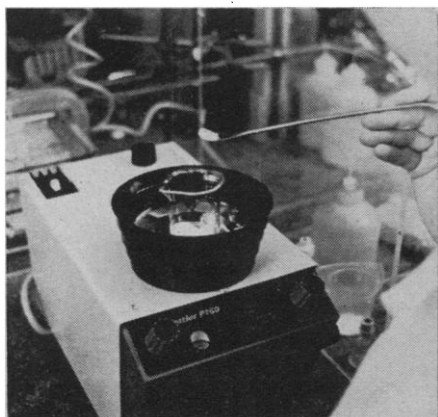
INTERNATIONAL SUBSIDIARIES: AMSTERDAM; CAPE TOWN; GENEVA; GLENROTHES, SCOTLAND; LONDON; MEXICO CITY; MUNICH; PARIS; STOCKHOLM; TOKYO; VIENNA

Circle No. 40 on Readers' Service Card



# Mettler fits economy plus performance into your balance budget.

Want weighing performance, but worried about exceeding your budget? Here are 38 solutions to the balance buyer's dilemma. Mettler's 16 top-loading and 22 analytical balances.



## **SPEED + PRECISION = PERFORMANCE**

Our top-loaders are tops when it comes to speed and weighing ease. Put the sample on the pan. Then read the weight. If you are filling a container to a target weight, Mettler's helpful filling guide shows the approximate weight on the pan throughout the filling . . . without interruptions.

Newest of the Mettler top-loaders is Model P162. It weighs up to 160 g with a precision of  $\pm 1$  mg and features 10-g taring ability. Like other Mettler top-loaders, it provides digital and analog readout. Your new personnel will get the same precise results as the old hands in the department.

## **MANY TO CHOOSE FROM**

Select the balance you need for your work from one of our top-loaders. We have one that weighs to 10 kg; another that takes arithmetic out of weight loss studies. Some automatically compensate for changes in level. All will carry out five types of weighings. Weighing unknowns. Checkweighing. Weighing-in. Batching. Weighing objects below the balance.

## **THE ECONOMICAL ANALYTICALS**

One of the major features of all Mettler analytical balances is the impressive precision-capacity ratio. Take our low-cost Model H10. It weighs to 0.1 mg over the 0 to 160-g range. That's one part in 1,600,000.

You get two balances for the price of one with our Mettler Model H20. It combines the capacity of a macro analytical with the precision of a semi-micro. Some Mettler analyticals give an instant reading of the approximate weight on the pan. We call this feature preweighing.

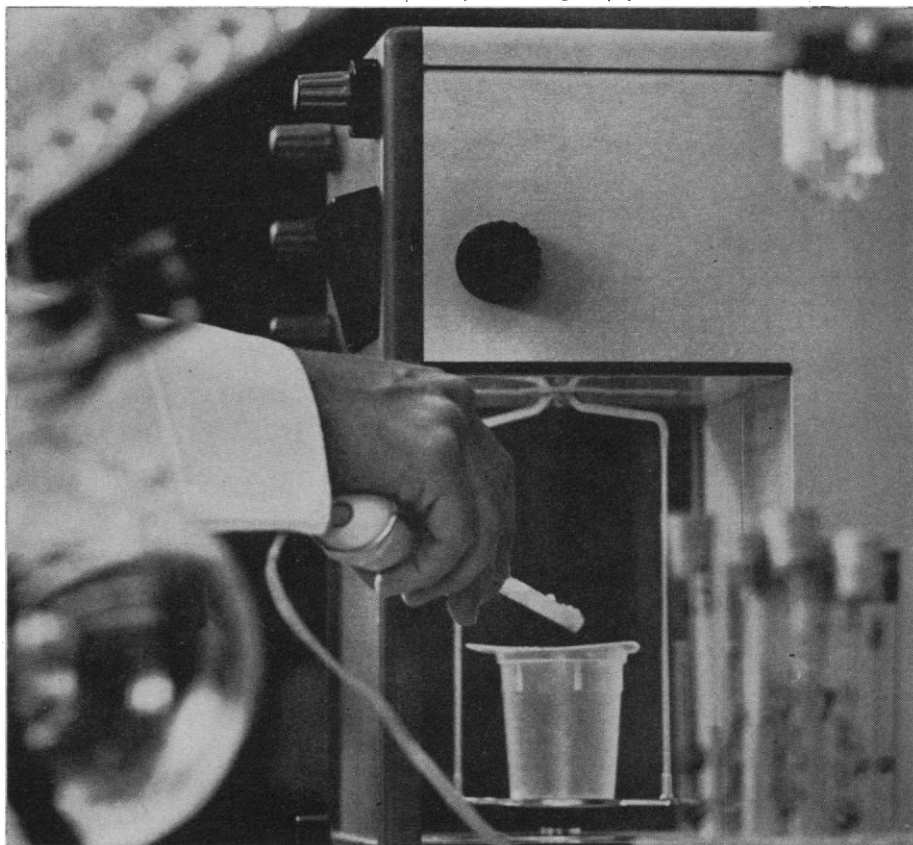
## **WEIGHT WATCHING MADE EASY**

With digital readout—standard on many Mettler analyticals—you'll weigh with unsurpassed speed, convenience and accuracy. A filling guide

cuts your weighing-in time by 50 percent. Optical taring allows you to compensate for container weights.

Need clearly printed records of your weighings? Check our Models H10P and H20P which print out results on adhesive-backed paper. Then there's our sophisticated H20E electronic. As it weighs, it generates an analog signal which can be fed to compatible instrumentation such as recorders. The H20E can also be interfaced with computer or other control equipment to continuously monitor and keep weight changes within predetermined limits.

There are more: from our \$550 basic balance that's ideal for classroom use to our \$2,550 ultra-micro with  $\pm 0.1$  microgram precision.



*Write Mettler Instrument Corporation, 20 Nassau Street, Princeton, New Jersey 08540*

**METTLER®**

5 September 1969

Vol. 165, No. 3897

# SCIENCE

<b>LETTERS</b>	A Neutral Stance Is Impossible: <i>M. R. Zavan</i> ; <i>XXX Chromosome: Legal Hazards: C. B. Goodhart</i> ; <i>Oil Spills—An Old Story: S. W. A. Gunn</i> ; <i>Undergraduates in Research: M. L. Goldstein</i> . . . . .	967
<b>EDITORIAL</b>	Potomac Valley Test Facility . . . . .	969
<b>ARTICLES</b>	The Cave Environment: <i>T. L. Poulson</i> and <i>W. B. White</i> . . . . .	971
	Vegetational Change Along Altitudinal Gradients: <i>E. W. Beals</i> . . . . .	981
	Better Written Journal Papers—Who Wants Them?: <i>J. H. Wilson, Jr.</i> . . . . .	986
<b>NEWS AND COMMENT</b>	Post-Apollo: NASA Seeks a Mars Flight Plan . . . . .	987
	Hurricane Seeding: A Quest for Data . . . . .	990
	Lead Poisoning: A Preventable Childhood Disease of the Slums . . . . .	991
	Technology Assessment: NAS Panel Asks New Federal Mechanisms . . . . .	992
<b>BOOK REVIEWS</b>	<i>Wildlife in Danger</i> , reviewed by <i>R. D. Taber</i> ; other reviews by <i>C. R. Wicke, J. M. Hunt, R. Schmid, R. M. Chute, J. S. Fruton, R. S. Juvet, Jr.</i> ; Books Received . . . . .	999
<b>REPORTS</b>	Mariner 6: Ultraviolet Spectrum of Mars Upper Atmosphere: <i>C. A. Barth et al.</i> . . . .	1004
	Jadeite: Shock-Induced Formation from Oligoclase, Ries Crater, Germany: <i>O. B. James</i> . . . . .	1005

<b>BOARD OF DIRECTORS</b>	WALTER ORR ROBERTS Retiring President, Chairman	H. BENTLEY GLASS President	ATHELSTAN SPILHAUS President-Elect	RICHARD H. BOLT BARRY COMMONER	HUDSON HOAGLAND GERALD HOLTON
<b>VICE PRESIDENTS AND SECTION SECRETARIES</b>	MATHEMATICS (A) Mark Kac F. A. Ficken	PHYSICS (B) Nathaniel H. Frank Albert M. Stone	CHEMISTRY (C) Charles G. Overberger Leo Schubert	ASTRONOMY (D) John W. Fidor Frank Bradshaw Wood	
	ANTHROPOLOGY (H) Jesse D. Jennings Anthony Leeds	PSYCHOLOGY (I) Wendell R. Garner William D. Garvey	SOCIAL AND ECONOMIC SCIENCES (K) Sheldon and Eleanor Glueck Harvey Sapolsky	HISTORY AND PHILOSOPHY OF SCIENCE (L) Loren C. Eiseley Raymond J. Seeger	
	PHARMACEUTICAL SCIENCES (Np) Joseph P. Buckley Joseph A. Oddis	AGRICULTURE (O) T. C. Byerly Michael A. Farrell	INDUSTRIAL SCIENCE (P) Gordon K. Teal Burton V. Dean	EDUCATION (Q) R. Will Burnett J. Myron Atkin	
<b>DIVISIONS</b>	<b>ALASKA DIVISION</b> Victor Fischer President Irma Duncan Executive Secretary	<b>PACIFIC DIVISION</b> William C. Snyder President Robert C. Miller Secretary	<b>SOUTHWESTERN AND ROCKY MOUNTAIN DIVISION</b> Newell A. Younggren President Marlowe G. Anderson Executive Secretary		

SCIENCE is published weekly on Friday and on the fourth Tuesday in September by the American Association for the Advancement of Science, 1515 Massachusetts Ave., NW, Washington, D.C. 20005. Now combined with *The Scientific Monthly*. Second-class postage paid at Washington, D.C. Copyright © 1969 by the American Association for the Advancement of Science. Annual subscriptions: \$12; foreign postage: Americas \$3; overseas \$5; single copies, 50¢ (back issues, \$1) except *Guide to Scientific Instruments*, which is \$2. School year subscriptions: 9 months, \$9; 10 months, \$10. Provide 4 weeks notice for change of address, giving new and old address and zip codes. Send a recent address label. SCIENCE is indexed in the *Reader's Guide to Periodical Literature*.



# AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

Algal Stromatolites: Deepwater Forms in the Devonian of Western Australia: <i>P. E. Playford and A. E. Cockbain</i> .....	1008
Autosomal Trisomy in a Chimpanzee: Resemblance to Down's Syndrome: <i>H. M. McClure et al.</i> .....	1010
Moon: Electrical Properties of the Uppermost Layers: <i>D. W. Strangway</i> .....	1012
Hormonal Stimulation of Lactose Synthetase in Mammary Carcinoma: <i>W. L. McGuire</i> .....	1013
Lymphocyte Stimulation: Transfer of Cellular Hypersensitivity to Antigen in vitro: <i>F. T. Valentine and H. S. Lawrence</i> .....	1014
Neutron Diffraction of Cell Membranes (Myelin): <i>D. F. Parsons and C. K. Akers</i> ..	1016
Cyclic Adenosine Monophosphate: Possible Mediator for Norepinephrine Effects on Cerebellar Purkinje Cells: <i>G. R. Siggins, B. J. Hoffer, F. E. Bloom</i> .....	1018
C-Fiber Responses in the Ventrolateral Column of the Cat Spinal Cord: <i>M. Manfredi and V. Castelluci</i> .....	1020
Infection as the Etiology of Spongiform Encephalopathy (Creutzfeldt-Jakob Disease): <i>C. J. Gibbs, Jr., and D. C. Gajdusek</i> .....	1023
Erythropoiesis in the Dog: The Periodic Nature of the Steady State: <i>A. Morley and F. Stohlman, Jr.</i> .....	1025
Hyperphagia and Polydipsia in Socially Isolated Rhesus Monkeys: <i>R. E. Miller et al.</i> .	1027
<i>Technical Comments: Monosodium Glutamate: F. R. Blood, B. L. Oser, P. L. White; J. W. Olney; Preventing Obsolescence of Scientific Reviews: An Updated-Review Project: P. Amacher, V. E. Hall, A. C. Norton; Thermoregulation and Norepinephrine: R. D. Myers; M. A. Simmonds and L. L. Iversen; Histochemical Fluorescence as an Index of Spread of Centrally Applied Neurochemicals: R. B. Montgomery and G. Singer; A. Routtenberg and W. Bondareff</i> .....	1028
<b>MEETINGS</b> Adirondack Conference on Electrostatics: <i>A. D. Moore and B. Vonnegut</i> .....	1033

MINA S. REES LEONARD M. RIESER	H. BURR STEINBACH KENNETH V. THIMANN	WILLIAM T. GOLDEN Treasurer	DAEL WOLFLE Executive Officer
-----------------------------------	---	--------------------------------	----------------------------------

<b>GEOLOGY AND GEOGRAPHY (E)</b> Richard H. Mahard William E. Benson	<b>ZOOLOGICAL SCIENCES (F)</b> David Bishop David E. Davis	<b>BOTANICAL SCIENCES (G)</b> William A. Jensen Arthur W. Cooper
<b>ENGINEERING (M)</b> Paul Rosenberg Newman A. Hall	<b>MEDICAL SCIENCES (N)</b> Allan D. Bass F. Douglas Lawrason	<b>DENTISTRY (Nd)</b> Robert S. Harris Richard S. Manly
<b>INFORMATION AND COMMUNICATION (T)</b> Dale B. Baker Ileen E. Stewart	<b>STATISTICS (U)</b> Ezra Glaser Rosedith Sitgreaves	<b>ATMOSPHERIC AND HYDROSPHERIC SCIENCES (W)</b> Robert M. White Louis J. Battan

## COVER

*Amblyopsis spelaea*, a specialized cave fish. The paired structures on the front of its head are olfactory sacs, not eyes. The lines visible on the head are rows of sense organs which detect water movement caused by swimming prey and by changes in water flow as the fish approaches obstacles. See page 971. [Thomas C. Barr, Jr., University of Kentucky]

The American Association for the Advancement of Science was founded in 1848 and incorporated in 1874. Its objects are to further the work of scientists, to facilitate cooperation among them, to improve the effectiveness of science in the promotion of human welfare, and to increase public understanding and appreciation of the importance and promise of the methods of science in human progress.

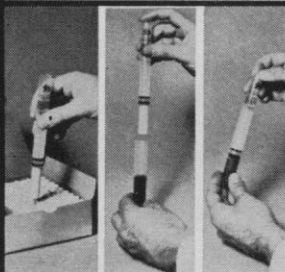
# Error Eliminators and \$ Savers from L/I



1. L/I LABQUAKE™

**1. L/I LABQUAKE™.** A silent, small, submersible tube rocker and rotator for all sizes of tubes, ¼" to 1½" diameter. Occupies only 2½ x 10 x 4 inches when fully loaded with 14 tubes. LABQUAKE has 28 tube positions altogether that accommodate clips to hold tubes of varying sizes. Adjustable bracket holds LABQUAKE fully or partially submerged in water bath.

**Price:** LABQUAKE (patent pending), for 110-120 VAC, furnished with (14) 13 mm and (14) 16 mm clips, \$59.50. Maximum capacity, 250 ml. Other clips may be substituted.



2. STAT-FILTER®

**2. STAT-FILTER®.** For instant filtration by high pressure or vacuum—in the palm of your hand. You get crystal clear filtrates within 3 seconds after precipitates form. All precipitates over 10 microns are retained with no possibility of remixing after separation. The versatile STAT-FILTER uses disposable polypropylene test tubes and plungers, making it suitable for **any** filtration. Inexpensive demonstration kits are available.

**Price:** complete STAT-FILTER SYSTEM, including 3 plungers, 100 disposable polyethylene filters and test tubes, and 25 test tube closures, \$38. Demonstration STAT-FILTER kit with 1 plunger, 10 filters, 7 test tubes and 3 closures, \$9.00.



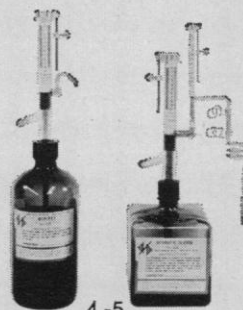
3. GRUNBAUM® PIPETS

**3. GRUNBAUM® PIPETS** (The Perfect Pipet). The versatile GRUNBAUM micro-pipet aliquots, dilutes, transfers, and stores reagents. It's self-adjusting, self-filling, non-dripping and self-cleaning (sample B washes out sample A). Guaranteed accuracy: 5 µl, ±3%, 10 and 20 µl, ±2%; 25 µl and larger, ±1%. Guaranteed reproducibility: 0.1% at 100 µl. Sizes stocked for immediate delivery: 1, 2, 3, 4, 5, 10, 15, 20, 25, 50, 75, 100, 150, 200, 250, 300, 400, and 500 µl. Other sizes on request.

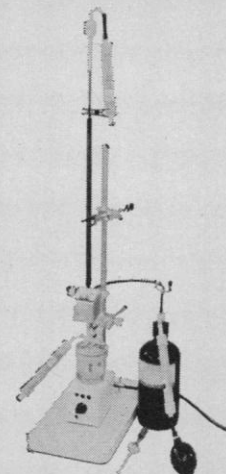
**Prices:** 1 through 5 and 75 µl, \$7. All others \$6.

**4.-5. Automatic REPIPETS® and Dilutors.** These unique instruments pipet, dilute and dispense with a *guaranteed* accuracy of 1% and a reproducibility of 0.1%. PYREX® L/I REPIPETS and Dilutors are of one-piece fused glass construction with no connections—eliminating any chance for leaks. L/I's instruments fit directly on your reagent bottles, ½ ounce and larger. Any reagent can be handled. All amber instruments are supplied for your labile reagents. Use L/I LAMBDA-DIALS® to increase precision to 1% at 10 lambdas! L/I stocks REPIPETS and Dilutors in ½, 1, 5, 10, 20, and 50 ml sizes, each adjustable from zero to full capacity. Square amber liter bottles optional at N/C.

**Prices:** REPIPETS, \$52.50; Dilutors, \$99.50. Micro and Macro Teflon® tips included.



4.-5. Automatic REPIPETS® and Dilutors



6. Aquametry Apparatus

**6. Aquametry Apparatus.** L/I's inexpensive Karl Fischer Aquametry Apparatus precisely determines water content of most materials in 4 minutes (1 ppm to 100% water). L/I's versatile apparatus uses the original stock K-F reagent bottle as a reservoir. The "reaction vessel" is an ordinary 4 oz., commonly available, disposable "cream" jar. It is interchangeable with a micro-reaction vessel requiring less than 2 cc total reaction volume for micro-aquametry applications.

No false end points are possible with L/I's color-coded meter indicator. A two-lambda excess of K-F reagent in a 100 ml reaction volume is detectable. The apparatus includes a 1 and 25 ml dual buret with .01 ml divisions in the micro range for high accuracy.

**Price:** \$340 complete. Components available separately.

**Order from Labindustries or your distributor.**

**LABINDUSTRIES**  
The Error Eliminators

1802 M Second Street • Berkeley, Calif. 94710 • Phone (415) 843-0220 • Cable: LABIND, Berkeley, Calif. (USA)

# Now, twice as inert!

Not really...but if you're looking for an inert gas-tight valve for handling fluids and gases, look at the Hamilton 2X Valve...It's twice as big as our thumb-sized inert valve. The 2X is constructed of inert parts encased in a metal body. A spring-loaded plug maintains a constant pressure on the plug, assuring leak tightness without adjustment. It was designed for panel mounting and the large handle will help you in easy selection of flow paths. The 2X has a .09" port diameter, and a wide variety of porting configurations. The valve body has female threaded terminals for which a wide variety of connectors are available. Let us send you literature on the 2X Valve. Write to Hamilton Company, Post Office Box 307, Whittier, California 90608.

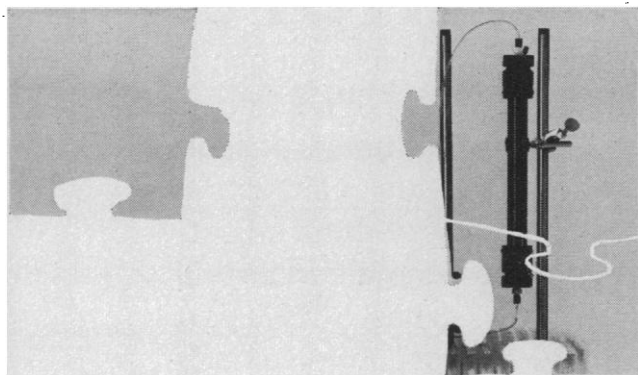
## Repeatable Precision: Hamilton's 2X Valve



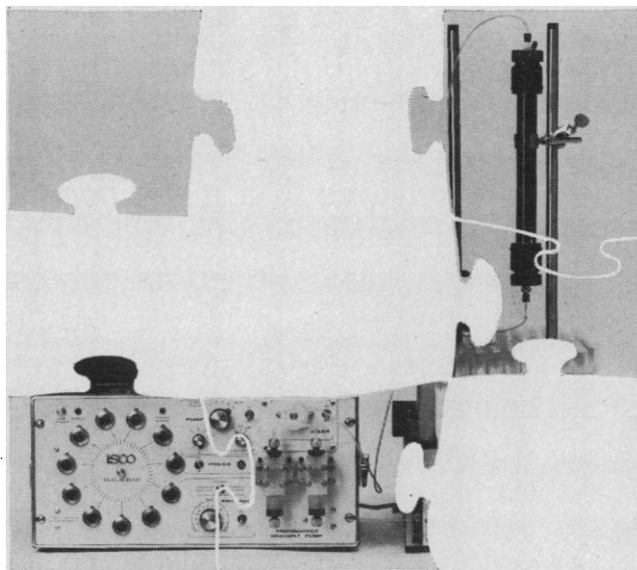
# HAMILTON



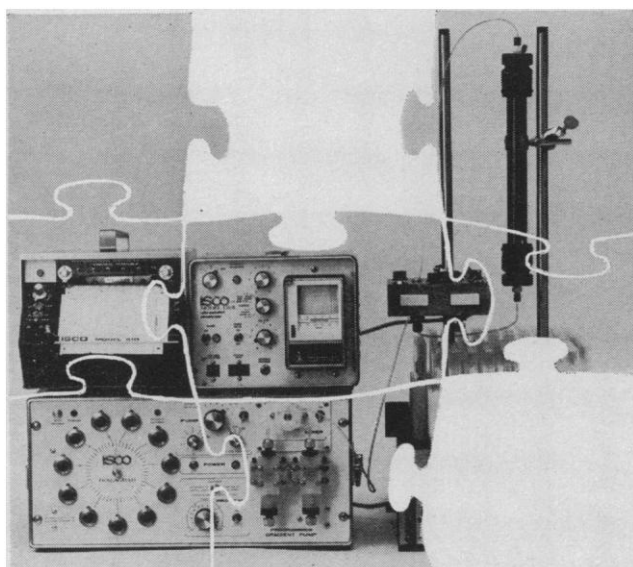
# Complete the picture



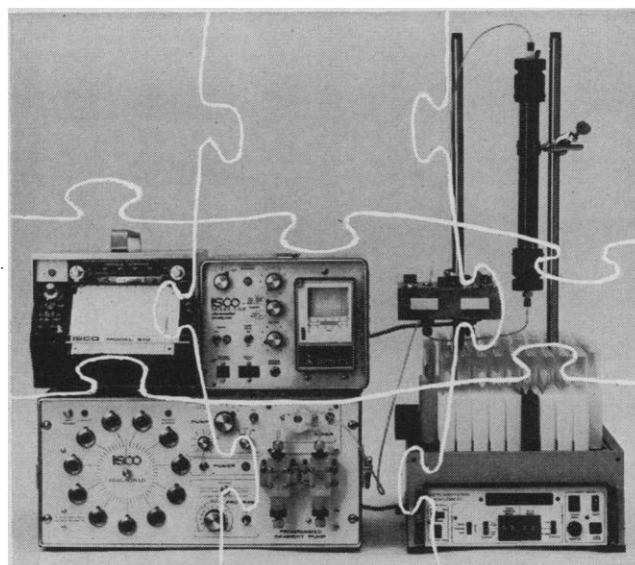
Start out with precision Glenco columns and accessories, available from ISCO in a wide range of sizes and types suited to almost any application.



Elute the column with a concentration or pH gradient generated by a Dialagrad Programmed Gradient Pump. Linear, concave, or convex, convoluted and spiked gradients can be reproduced at flow rates from 1 to 3,200 ml/hr.



An ISCO UV monitor and recorder will locate and quantitate absorbance (O. D.) peaks at two wavelengths simultaneously, and can index a fraction collector in such a way as to deposit different peaks into different tubes.



Your faithful Golden Retriever Linear Fraction Collector can retrieve up to 210 tubes in removable racks by time, volumetric, or counted drop increments.

**For the solutions to your other biochemical instrumentation puzzles, send for our catalog.**



**INSTRUMENTATION SPECIALTIES COMPANY**

4700 SUPERIOR • LINCOLN, NEBRASKA 68504 • PHONE (402) 434-0231 • CABLE ADDRESS: ISCOLAB LINCOLN

**Wouldn't it be great if  
someone designed a 160 g  
top-loader with 1 mg accuracy  
and all-digital readout?**

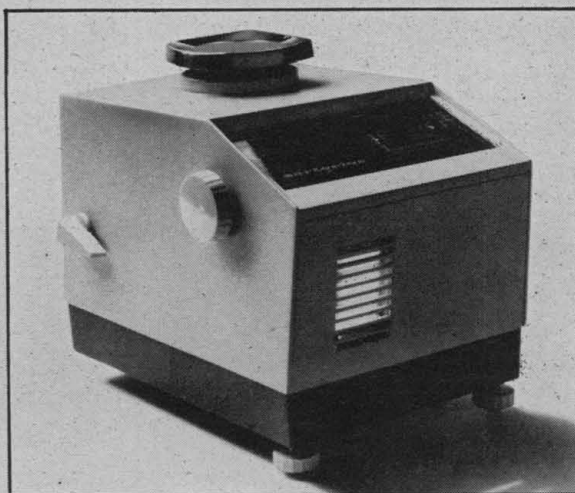
**Someone has.  
Sartorius.**

There are other top-loading balances with 160g capacity, but none is as accurate and easy to read as the new Sartorius 2255... and none is as stable.

To eliminate interpolation error with 'between the line' results, the Model 2255 provides all-digital readout to 1 mg. To further insure accuracy, there is absolutely no discernible swing—this balance stays at the indicated weight. There's no need to squint, either. Its huge new optical scale is a pleasure to read, even under the most adverse lighting conditions.

At only \$725, the above features alone would make the 2255 a great buy, but there are more. The Taramatic® single knob taring system and below-balance weighing accessories are included at no extra cost.

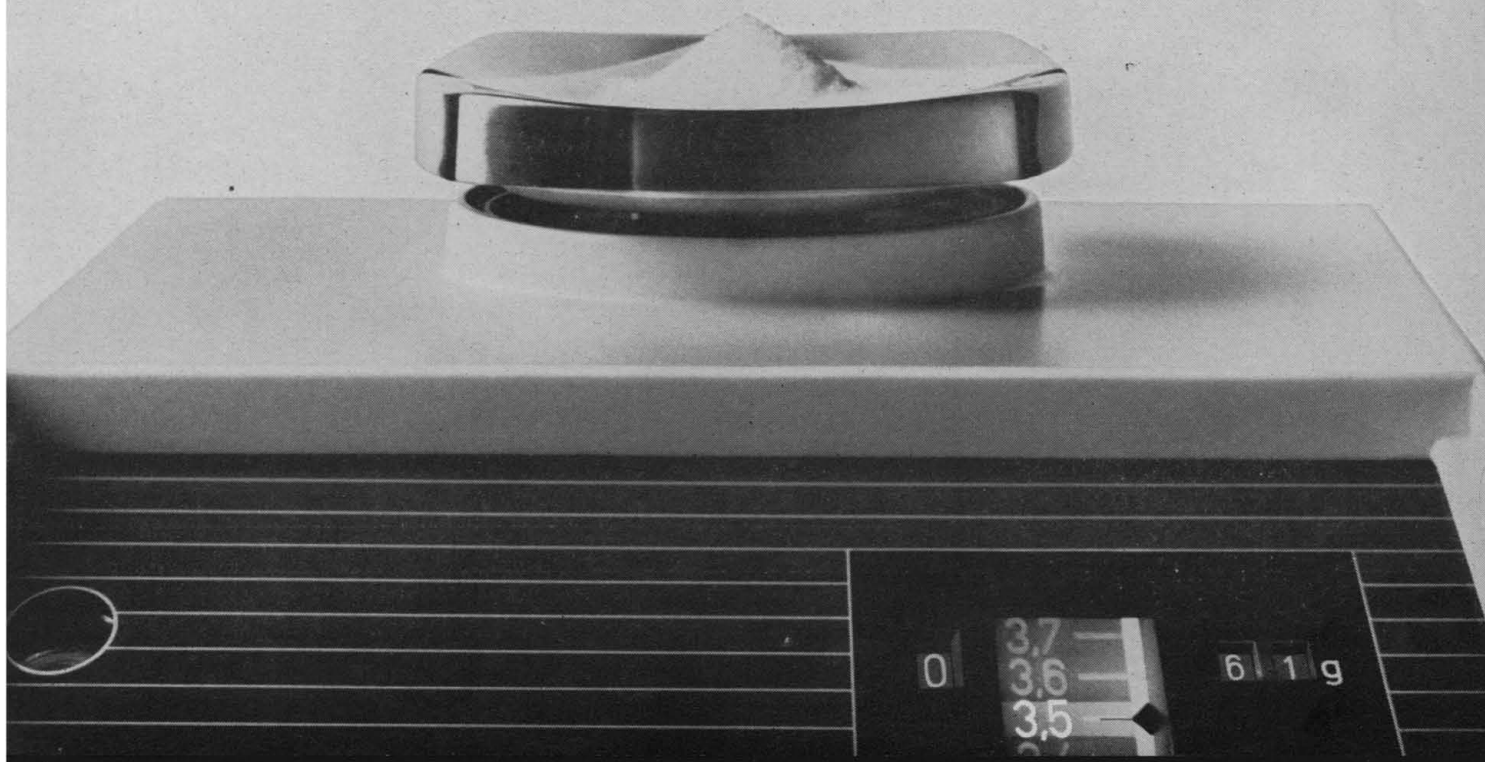
For research, quality control, student use, or any other application requiring 1 mg weighing accuracy at loads up to 160g, this is



the simplest, yet most advanced top-loading balance available.

Sartorius all-digital top-loaders also come with higher capacities. Our 40-page catalog describes them all. For your copy, just write: Sartorius Division, Brinkmann Instruments, Cantiague Road, Westbury, N.Y. 11590.

**sartorius balances**



## You can judge some brooks by their covers!

**For others you need Technicon's totally automated system for water quality analysis.** The Technicon<sup>®</sup> CSM<sup>®</sup> 6 water analysis system will determine the concentrations of six important pollution parameters (to be selected by the user) in rivers, lakes, drinking water, or water-treatment plants.

A mobile CSM 6 system set up on site will perform six analyses simultaneously on a continuous basis for a period of hours, or for as long as one week, virtually without

human attention. The CSM 6 Laboratory Model is designed to perform analyses of individual samples in the lab.

Techniques employed in the CSM 6 automated analysis system are based on "Standard Methods for Water and Wastewater," accepted internationally. The system's range of sensitivity is variable, permitting detection of pollutants in terms as low as parts per billion.

To get below the surface with your water quality analysis, let Technicon's CSM 6 system do your brook reviewing.



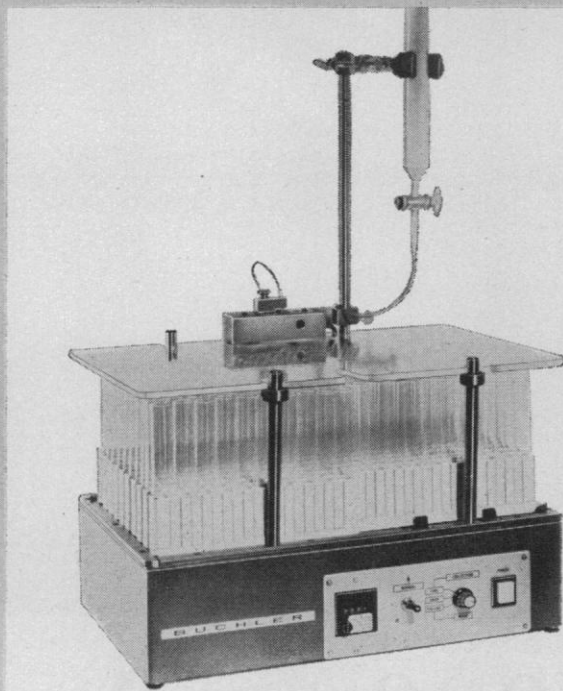
Department 64  
Technicon Corporation  
Environmental Science Division  
Tarrytown, New York 10591



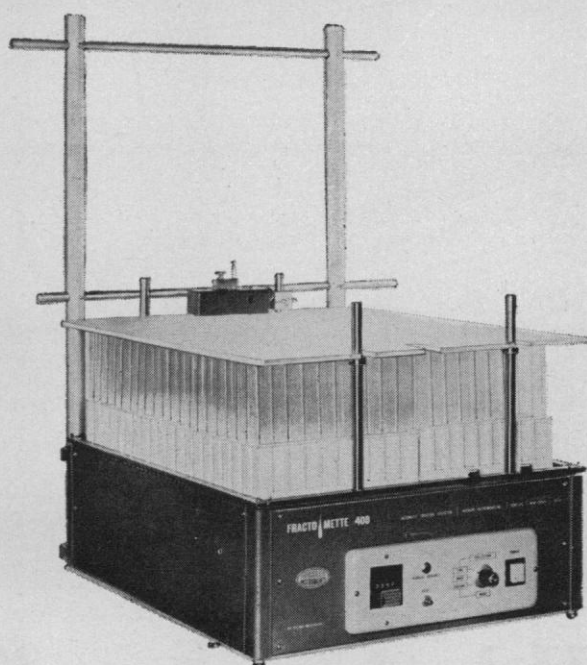


Collect the **LARGEST** Number of Samples  
in the **LEAST** Amount of Space

**BUCHLER INSTRUMENTS**  
**LINEAR FRACTION COLLECTORS**



**FRACTOMETTE 200**



**FRACTOMETTE 400**

Here are two compact, versatile fraction collectors designed to do a big job in a small space. They both operate on the same principle, however, the "Fractomettte 200" uses 200 18 MM test tubes while the "Fractomettte 400" has a capacity of 400 tubes. Both fraction collectors provide drop, time and volume methods of collection. The fractions dispense directly into the tubes preventing cross-contamination. Automatic features include drop-stop which prevents stray drops or loss of sample and a shut-off device which is activated after a predetermined number of fractions are collected.

The "Fractomettte 200" is 11½" x 17½" . . . small enough to operate in a household refrigerator. Although double the capacity, the "Fractomettte 400" measures only 17½" x 24½".

Write today for complete information



LABORATORY APPARATUS • PRECISION INSTRUMENTS  
**BUCHLER INSTRUMENTS, INC.**  
1327 16TH STREET, FORT LEE, NEW JERSEY 07024

For Further Information Request Technical Bulletin S3-4300-4400

Circle No. 9 on Readers' Service Card



# We'll bring you \$70,000 worth of Analog/Hybrid computers for 6¢. Anytime. Anywhere.

Last year we launched a demo-van program so research laboratories and engineering schools could learn first-hand what analog/hybrid computers could do for them.

For the first time, hundreds of labs saw analog/hybrid computers simulate complex dynamic systems. So the investigator literally got his hands on every parameter of the problem. Got right answers. On time.

Big benefits that only analog/hybrid computers bring.

The program was so successful that we've now expanded it. One of our vans will go anywhere in the U.S. to show you what analog/hybrid computers will do for you. Except Hawaii or Alaska. For the time being anyway.

There's no obligation on your part. Oh, sure we'll try to

sell a little. But the sell is soft. And informative. And could be very, very rewarding for you.

All you have to do is drop us a line. That's where the six cents comes in. And if you don't have a stamp handy—we'll never yet refused a collect call. Try us. Electronic Associates, Inc., W. Long Branch, N. J. 07764 (201) 229-1100. Ask for "Demo Van."

## EAI®

Circle No. 39 on Readers' Service Card

## PROBLEM:

---

## MOVE TWO MATCHES TO FORM FOUR EQUAL SQUARES.

---

## SOLUTION:

One way is by hit-and-miss. It will work but it might take time. There are more than 60,000 possibilities.

Another way is to select and utilize the relevant facts from the available data base. Thus, there are exactly 16 matches in the puzzle. A square has four sides. Therefore no match can form a common side.

CCM Information Corporation is in the business of assembling data bases, and then applying advanced computer and microform processing techniques to make relevant facts available as they are needed. For instance:

---

CCM Information Corporation provides six monthly abstract services covering 1,723 primary journals published in more than 16 languages. Each service rigorously covers a single specific field—virology, genetics, microbiology, aquatic biology, calcified tissues. Abstracts are usually available within six to eight weeks of publication of the original paper.

---

In cooperation with the U.S. Office of Education, CCM Information Corporation has developed the CURRENT INDEX TO JOURNALS IN EDUCATION, a new monthly publication that provides a comprehensive, computer-generated index to the full contents of more than 250 major educational journals, as well as relevant material from peripheral publications.

---

From more than 250,000 manuscript pages a year translated from 50 languages and covering journals, reports, documents and books, RESEARCH AND MICROFILM PUBLICATIONS published by CCM Information Corporation, provides the only comprehensive monthly indexing service to the entire output of USJPRS.

---

The PANDEX Current Index to Scientific and Technical Literature. A bi-weekly index service covering 2,400 journals, 35,000 U. S. Government Research and Technical Reports, and 6,000 books annually.

---

The WORLD MEETINGS Information Service. The definitive reference to meetings of interest to scientific, medical and engineering investigators throughout the world.

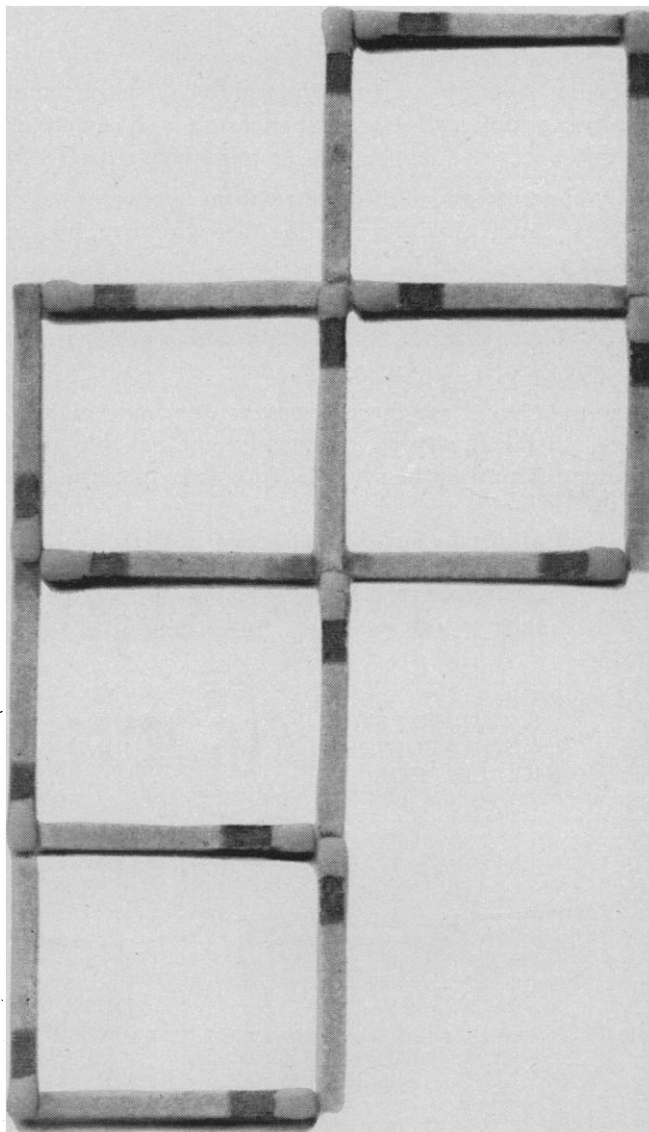
---

The CURRENT INDEXES TO CONFERENCE PAPERS IN CHEMISTRY, LIFE SCIENCES and ENGINEERING. Three monthly indexes, organized by subject and author, of all significant papers delivered at more than 125,000 important scientific and technical meetings throughout the world.

---

The COLLEGE BLUE BOOK. The most comprehensive collection of information on secondary education ever assembled. A new edition—comprehensively revised and containing all 1969 data—to be published in the fall of 1969.

---



If one of these services appears relevant to your needs, please write for more information. Also, should you require it, a solution to the puzzle.

---

**CCM INFORMATION CORPORATION**  
A subsidiary of Crowell Collier and Macmillan  
909 THIRD AVENUE, NEW YORK, NEW YORK 10022



# Low-priced NAPCO OVENS now have a high-priced stainless steel interior...

## At no added cost!

Lifting the cover of a water bath used to be a messy chore ... water dripping all over the bench-top (and sometimes into the specimens) and a clean-up job afterward.

Now you don't have to lift a lid to observe a water bath's contents. With NAPCO's new see-through cover, all you do is look!

It's the latest improvement in the highly successful line of NAPCO Water Baths ... long noted for high performance, sleek good looks and buying economy.

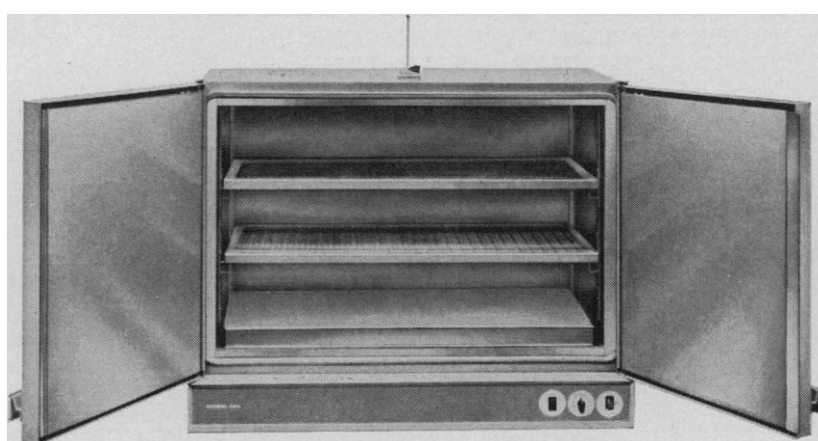
The new NAPCO see-through covers are made of high-clarity, chemically inert, practically unbreakable polycarbonate. There's a neatly molded corner to permit use of a thermometer and the handle is centered for a better grip. Best of all, the see-through cover retards evaporation, so that the water level remains more constant.

**SALES OFFICES:** Philadelphia/Chicago/Portland/Los Angeles

**NOW  
UNDERWRITERS'  
LABORATORIES,  
INC. LISTED!**



# 420



# 430

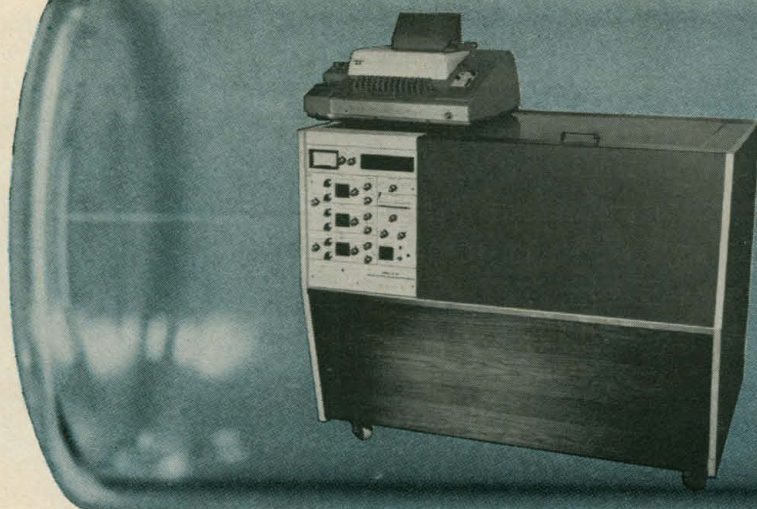
NAPCO Water Baths come in three sizes: 1½, 3½ and 6 gallons. Tanks are leakproof, solderless welded, with a perfectly smooth interior to reduce possibilities of contamination. Water temperatures are controlled to within  $\pm 0.5^{\circ}\text{C}$  and a built-in safety thermostat is standard. The unique warm air jacket surrounding the tank protects against overheating even if the tank runs dry. Add to these advantages the new see-through gable cover ... and there's no better water bath available!



**National Appliance Company**

**10855 SW Greenburg Rd., Portland, Ore. 97223**





## From counting vial to finished form— a liquid scintillation system that begins where others stop.

With its core memory computer our SL-40 Liquid Scintillation Spectrometer can provide a variety of complete data presentations like the one illustrated below. In addition it provides true computed DPM utilizing the external standard ratio method. Where self-absorption is the source of quenching, DPM is computed by the channels ratio method. Single, dual and even triple label DPM are provided automatically.

Percent standard deviations are accurately computed from the gross counts in each channel as well as CPM and isotope ratios (dual label experiments). These are only a few of the standard computations provided with each printout.

One control selects any of seven standard printout formats. What's more, SL-40 systems accept special programs to fit your specific needs.

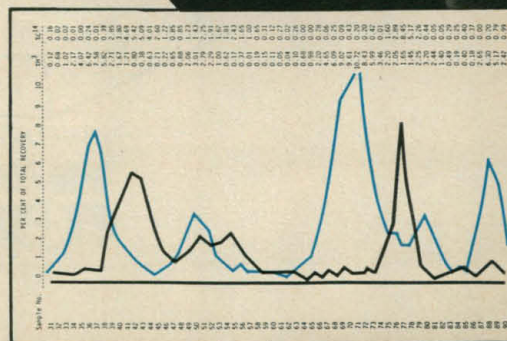
"User Oriented" is the best way to describe the SL-40. It features

- three separate channels of pulse height analysis plus two additional channels for external standardization
- instant channel setup with pre-calibrated channel settings for single and dual label samples
- controlled temperature operation
- 200 sample capacity
- push button sample handling . . . and more.

For more information plus sample graph printouts, contact your Intertechnique representative or Intertechnique Instruments, Inc., Randolph Industrial Park, Dover, New Jersey 07801.  
Telephone: (201) 361-5550.

  
**INTERTECHNIQUE**  
DOVER, NEW JERSEY

Assay showing percent  
recovery of  $H^3$  and  $C^{14}$   
printed out and plotted  
. . . on line





It pays to listen to everybody.

Like the time Danish physicist Dr. Niels Bohr let the air out of Professor Einstein's objection to the Heisenberg uncertainty principle. You may recall how the Professor postulated a box lined with perfect mirrors having an alarm clock inside, the entire device suspended from a balance.

The contrivance suggested the Heisenberg principle wouldn't work in a 4-dimensional universe. That had Dr. Bohr stumped. Until

he recollected having listened to Einstein's theory making the rate of the clock a function of gravity and saw that the clock's rate of operation must depend on its position in the gravitational field of the earth.

" 'Twas sport to have the master hoist with his own petard."

We listen to everybody, too. We draw on the experience and know-how of The Radiochemical Centre at Amersham, England, and G. D. Searle & Co.

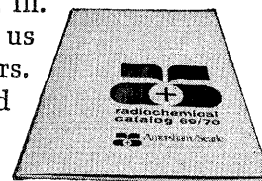
Now we're listening to you and learning more every day. Which is why we can serve you so well.

Which is just as satisfying as winning a joust with Professor Einstein.

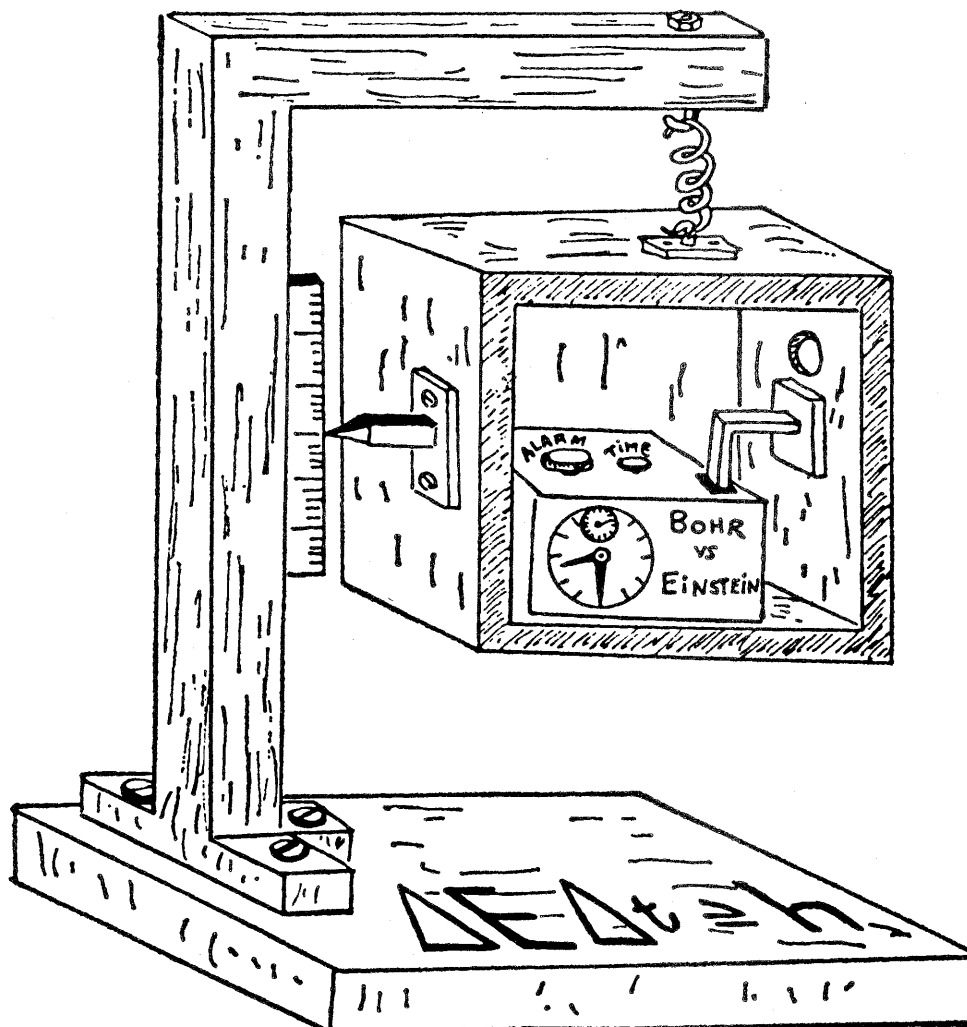
Need technical assistance? Call our Customer Service Dept. in Des Plaines, Ill.

We're all of us good listeners.

And send for our first edition,



how the great Dane helped  
old  $mc^2$  box himself in



2000 NUCLEAR DRIVE, DES PLAINES, ILLINOIS 60018 TELEPHONE: (312) 296-1055

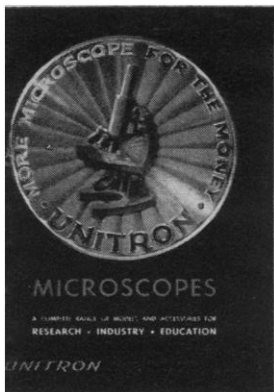


**Amersham/Searle**

AMERSHAMSEARLE CORPORATION:  
AN ACTIVITY OF G. D. SEARLE & CO. AND THE RADIOCHEMICAL CENTRE

"From THIRTY YEARS THAT SHOOK PHYSICS by G. Gamow, illus. by G. Gamow, copyright 1966 by Educational Services, Inc., pub. by Doubleday & Co., Inc."

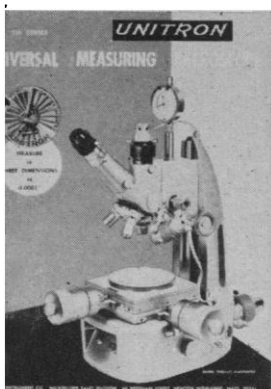
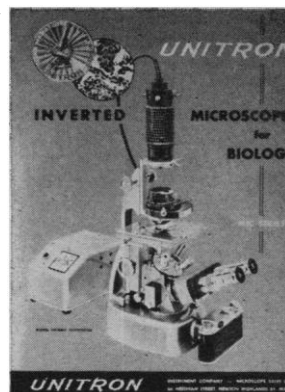
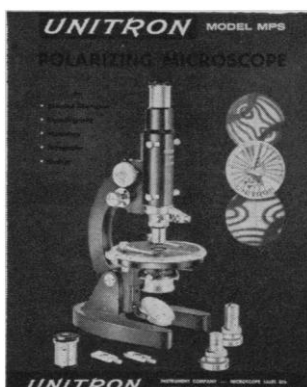




## FREE MICROSCOPE BUYING GUIDE

Shown here in miniature are just some of the informative brochures which comprise the UNITRON Catalog . . . your buying guide to quality microscopes at prices within your budget. Whether your application is routine laboratory analysis, advanced biological research, or industrial quality control, you will find the instrument you need in UNITRON's complete line.

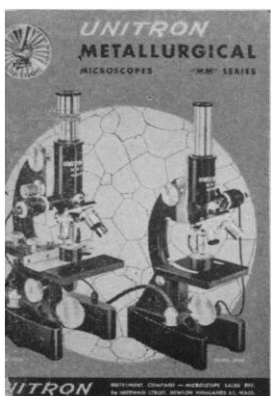
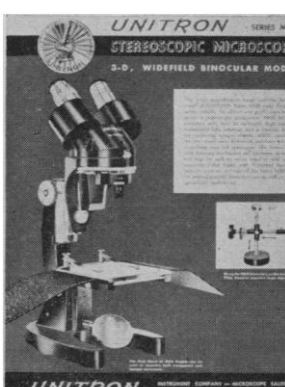
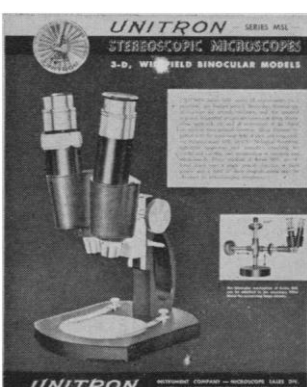
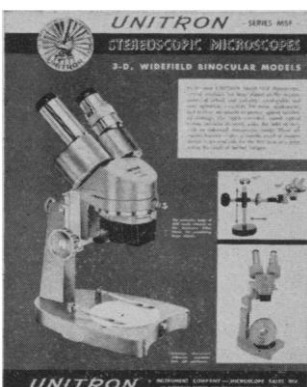
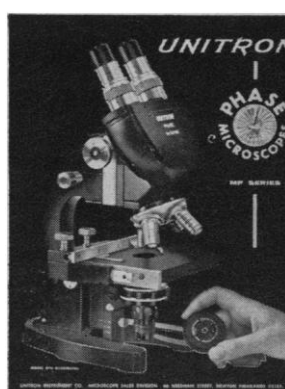
**A UNITRON MICROSCOPE CATALOG is Yours for the Asking.**



## TRY ANY UNITRON MICROSCOPE FREE FOR 10 DAYS

A salesman's demonstration gives you only about 30 minutes to examine a microscope, hardly the best conditions for a critical appraisal. But UNITRON's Free 10 Day Trial gives you the opportunity to evaluate any model in your own laboratory and prove its value in your own application before you decide to purchase. See for yourself, as have thousands of other buyers, why . . .

**UNITRON Means More Microscope for the Money.**



Please send UNITRON's Microscope Catalog No. L-4

Name

Company

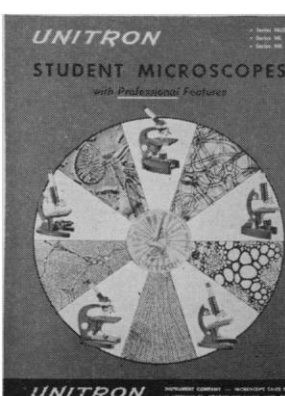
Address

City  State  Zip

Circle No. 10 on Readers' Service Card

**UNITRON**  
INSTRUMENT COMPANY

MICROSCOPE SALES DIVISION  
66 NEEDHAM STREET  
NEWTON HIGHLANDS  
MASSACHUSETTS 02161





# Quigley-Rochester, Inc. PRODUCT PRESENTATION

## CELL DISRUPTION:

THE B. BRAUN MSK  
MECHANICAL CELL  
HOMOGENIZER



World's most popular mechanical cell disrupter. Heavy duty - disrupts 99% of all cells in 2-4 minutes at 4°C. Processes up to 10 grams of cells at one time. Safe, reliable, efficient. First choice for preparation of bacterial cell walls, bacterial and yeast extracts. Integral provision for sample cooling.

**PRICE ONLY \$890.**



THE SONIC  
DISMEMBRATOR

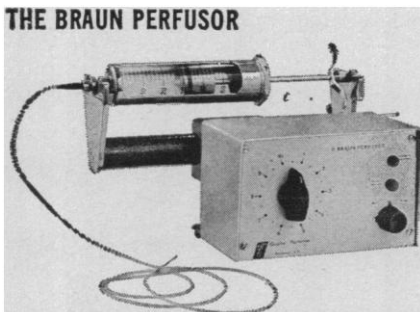
Lowest cost ultrasonic cell disrupter in its class. Greater efficiency with less heat generation. Balanced power design utilizes maximum watt density for optimal performance. Excellent disruption with minimal noise. Convenient automatic tuning allows high reproducibility. Titanium tips and accessories; infinitely variable power output; ceramic transducers (less than 10% heat loss); simple, two-control operation.

**PRICE ONLY \$745**

**For further information, write  
Quigley-Rochester, Inc.,  
250 N. Goodman Street,  
Rochester, New York 14607.**

## INFUSION APPARATUS:

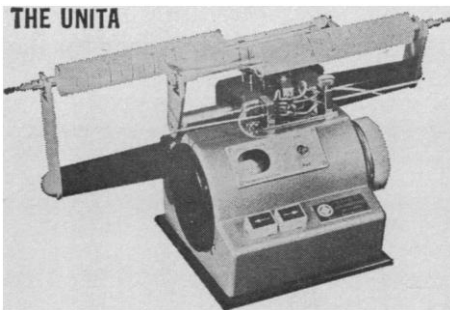
THE BRAUN PERFUSOR



Safe, automatic way for infusion or withdrawal of small volumes of solution at constant, accurately reproducible rates — from 0.2 to 600 ml per hour. Operates at back pressures up to 1000 mm Hg. High versatility, — 70 different rates, choice of 3 glass syringe sizes or disposables, infusion or withdrawal, adjustable cutoffs and a large variety of accessory valves and fittings.

**PRICE ONLY \$485**

THE UNITA



Time-tested instruments for accurate infusion. UnitA I has 24 step plunger feed rates — 0.125  $\mu$ l/min. up to 5 ml/min.; 39 infusion rates using 50 and 5 ml syringes; simultaneous operation of up to 6 syringes; front settings; adjustable limit switch with preset cutoff for unattended operation; pilot lamp signals end-of-run; and special clutch protects against back pressures above 400 mm Hg.

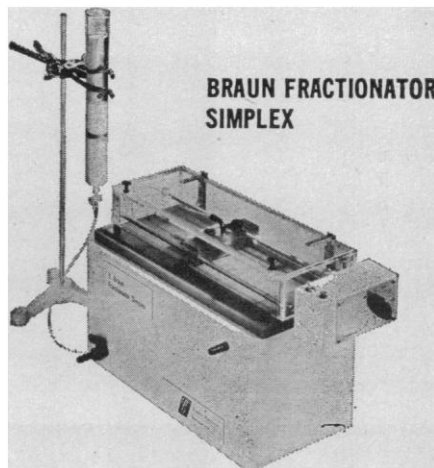
UnitA II is similar but with two syringes operating simultaneously in opposite directions — one filling, the other discharging indefinitely for infusion of unlimited volumes. Variable 12 plunger feed rates.

**UNITA I PRICE ONLY \$645**

**UNITA II PRICE ONLY \$795**

## ENZYME PURIFICATION:

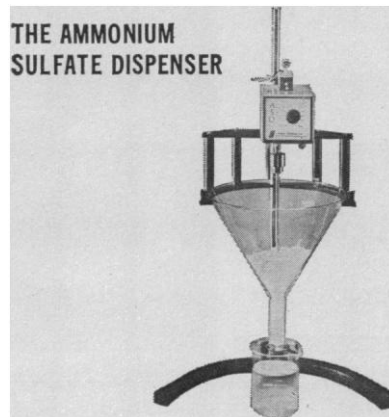
BRAUN FRACTIONATOR  
SIMPLEX



The only fraction collector that can collect sterile and oxygen free samples in column chromatography. Integral cooling eliminates separate refrigerator. Takes less than one square foot bench space. Collects 102 fractions — from 50 fractions/hr. to 1 fraction/20 hrs. Instant analysis possible. Features a uniquely new, trouble-free operating design — no on/off cycles, no contacts, no mechanical relays, no solenoids.

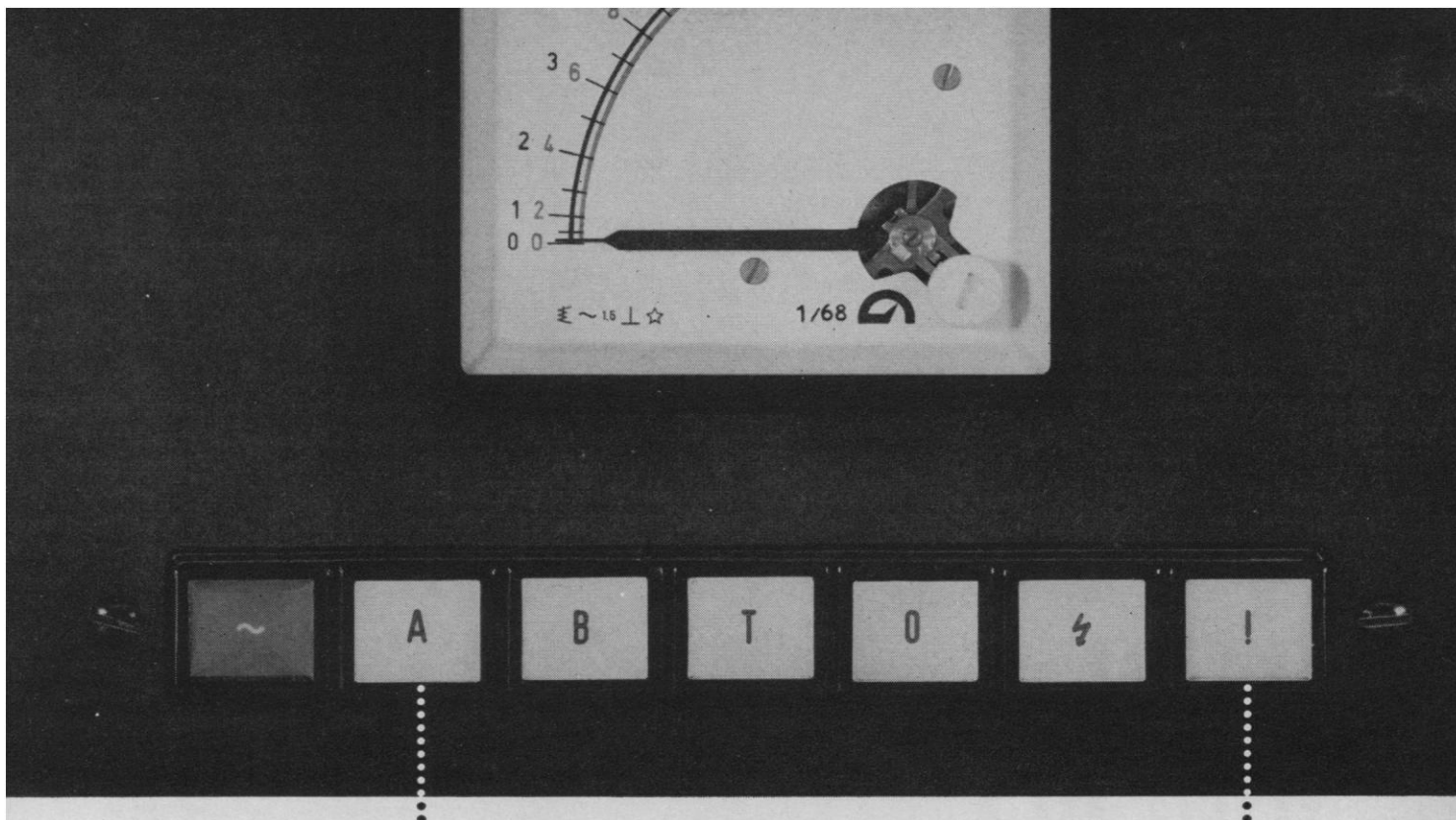
**PRICE ONLY \$795**

THE AMMONIUM  
SULFATE DISPENSER



A completely new apparatus for automatic dispensing of  $(\text{NH}_4)_2\text{SO}_4$  in enzyme precipitation work. Auger-type device carries ammonium sulphate through a Teflon® pestle for slow, uniform dispensing. Rates may be adjusted by means of a variable speed motor. Also can be used as a very efficient laboratory stirrer.

**PRICE ONLY \$185**

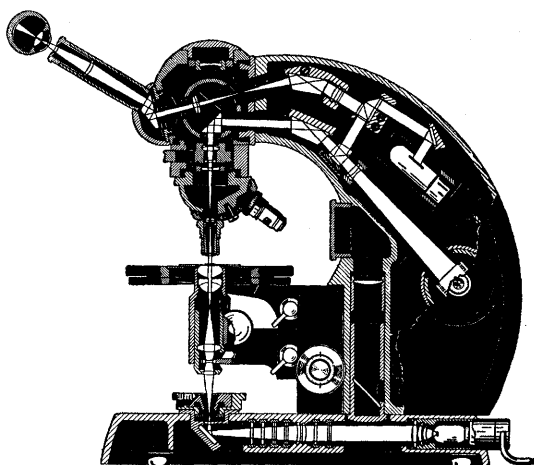


This button does all the work. Push it and ...  
It opens the shutter.  
Exposes the film the proper length of time.  
Closes the shutter.  
Advances the film to the next frame.  
Advances the frame counter.  
Recocks the shutter ready for the next exposure.

This is the panic button. It flashes when ...  
You forgot to load the camera.  
You've run out of film.  
The film is torn.  
You've reached the end of the roll.  
You can't push button A while button ! is flashing.

## Introducing the Photomicroscope II...

### A tale of two buttons.



Cut-away view of the Zeiss Photomicroscope II.

What the other buttons do is give you added versatility. But there are more important things to talk about here.

Such as the stability between camera and microscope only an integrated system can offer.

Such as exposure times from 1/100 sec. to hours, if need be.

Such as automatic exposure control for all films rated from 2½ to 8000 ASA.

Such as a system specifically designed to take optimum advantage of the latest high speed color films.

Such as increased sensitivity for selected-area "spot" readings—particularly helpful for dark-field and fluorescence work.

Such as a whole lot more.

The new ZEISS Photomicroscope II makes photomicrography literally a snap—as easy as using any quality 35mm automatic amateur camera. But it's as professional an instrument as you can get.

For complete information, including what the other buttons do, write Carl Zeiss, Inc., 444 Fifth Avenue, New York, N.Y. 10018.

Nationwide service.

# ZEISS

THE GREAT NAME IN OPTICS



ATLANTA, BOSTON, CHICAGO, COLUMBUS, DENVER, HOUSTON, LOS ANGELES, PHILADELPHIA, ST. LOUIS, SAN FRANCISCO, SEATTLE, WASHINGTON, D. C.

Circle No. 19 on Readers' Service Card



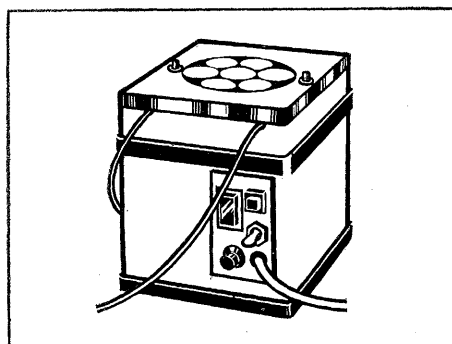
This compact pump is only 125×125×155 mm (5×5×6 in).  
It can handle corrosive, sterile and dangerous materials  
with complete safety.



IN THE SERVICE OF SCIENCE

LKB INSTRUMENTS INC. • 12221 PARKLAWN DRIVE • ROCKVILLE MD. 20852

SALES AND SERVICE THROUGHOUT THE WORLD: STOCKHOLM, THE HAGUE, COPENHAGEN, ROME, VIENNA, LONDON



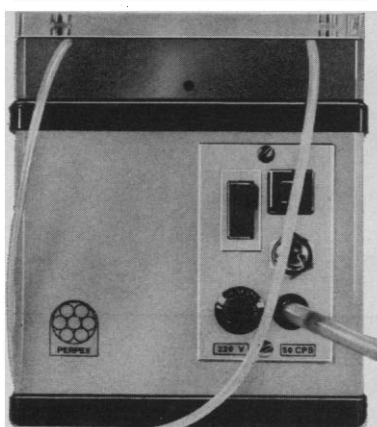
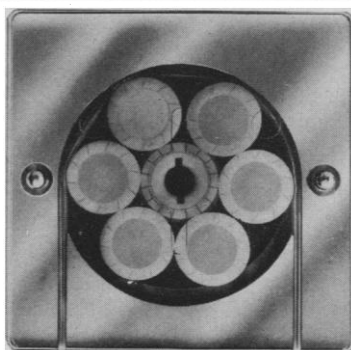
# PPP's with lo P

Perpex Peristaltic Pumps with low Pulsation.

The Perpex and VarioPerpex pumps, which form the new LKB pump range, have been specially designed for chromatographic, electrophoretic and all other analytical operations requiring a steady flow over long periods.

Compact and lightweight, well capable of meeting the vigorous requirements of research and industrial laboratories.

Accurate flow rate and minimal tube wear due to the patented, machined, plastic roller system.



The VarioPerpex has continuously variable flow rates within the wide range 1.6 to 200 ml per hour, for a standard gear box, and lower flow rates are possible by using other easily exchangeable gear boxes.

Fluctuations, due to mains voltage variations, have been reduced to a minimum by the employment of a step-motor.

The Vario Perpex has all the design advantages of the Perpex Pump.

The Perpex Pump provides continuous, precise delivery of a great variety of liquids and gases without pulsation even at the lowest speeds.

Takes up little space on the bench, can be conveniently stacked to provide multiple channels, and the absence of bearings in the pumping area eliminates vibration, and contamination from grease. Six standard gears are available and a choice of drive ensures accurate, repeatable pumping speeds.



PLUS ONE P MORE—PRECISION!

# “...one giant leap for mankind!”



Reaching the moon was an awesome scientific and intellectual accomplishment for man . . . and it's only the beginning. Curtin is one of the companies which is contributing to the U. S. Space Program. Our involvement goes back to the very beginning when we supplied scientific apparatus and

instruments to the first NASA laboratories. We have furnished items used in connection with all 21 manned space flights including custom glass instrumentation for Apollo 11's Lunar Module Eagle and equipment for the Lunar Receiving Laboratory. We are proud of our part in the Greatest Journey.

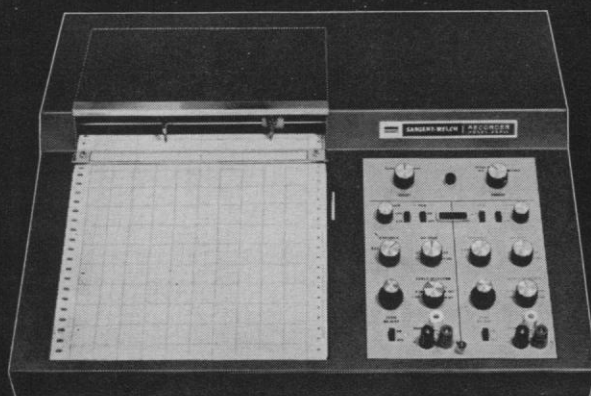


## **CURTIN SCIENTIFIC COMPANY**

**SCIENTIFIC APPARATUS • CHEMICALS • LABORATORY FURNITURE**

HOUSTON • TULSA • LOS ANGELES • NEW ORLEANS • ATLANTA • SAN FRANCISCO  
DALLAS • PITTSBURGH • BOSTON • MIAMI, FLA. • JACKSONVILLE • WASHINGTON  
WAYNE, N. J. • ST. LOUIS • SEATTLE • MINNEAPOLIS • MEXICO CITY • MONTERREY

# How many linear-log recorders in this picture?



## Wrong.

Not one, but *two*. In our new Model DSRLG recorder, there are *two* independent linear-logarithmic channels, each with its own recording pen. So for all practical purposes, the Model DSRLG is (are?) two recorders in one.

The benefits of this double life: When connected to spectrophotometers, photometers, densitometers, and the like, the Model DSRLG will record simultaneously both transmittance *and* absorbance. And when properly factory-equipped and then connected to a spectrophotometer with a transmittance output, the DSRLG will simultaneously record both absorbance *and* log absorbance (extinction coefficient).

There are other ways to put the DSRLG to work, of course. Such as recording absorbance as a function of a nonlinear variable (temperature, pressure, etc.) which is also recorded. Or recording, linearly or logarithmically, *any* two time-synchronized variables.

So much for what and why. Now for *how*. The DSRLG uses precision, nonlinear *gears* to achieve logarithmic response. And that's a more accurate, truer method than electrical circuit approximations. (The log gears are quickly interchangeable with the linear gears.) You simply set the switches for *automatic* gain adjustment at all points in the log scale and for *automatic* divider zero-point.

Add in some of the DSRLG's other good points—all solid-state circuitry; circuit guarding to prevent interchannel communication and to reject A.C. and D.C. interference; seven switch-selected chart spans with continuously variable expansion of each from 100% to 40%; three-speed synchronous chart drive; 240-mm wide chart; a pen response of less than 1 second; zener-diode-regulated reference circuits—add all of those points in, and you've got quite a dual-pen, linear-log recorder for \$2075.

Call your Sargent-Welch representative for a DSRLG demonstration. Or write to us for additional information.

9-22B

 **SARGENT-WELCH**

958

Scientific instruments, apparatus, chemicals.  
Sargent-Welch Scientific Company  
7300 N. Linder Ave.; Skokie, Illinois 60076

Circle No. 37 on Readers' Service Card

Chicago/Anaheim/Birmingham/Cincinnati  
Cleveland/Dallas/Denver/Detroit  
Springfield, N.J./Toronto/Montreal/Vancouver

SCIENCE, VOL. 165



# Turn on with the reliable ones



**SS-4 Manual Superspeed Centrifuge**  
RCF's to 34,800 x g — Speeds to  
17,000 rpm

Either of these SORVALL Table-Top Superspeed Centrifuges can give you years of research-quality centrifugation combined with rotor, tube, and adapter versatility. The SS-3 is automatic; the SS-4 is manually controlled. Both incorporate Gyro-Action Direct Drive (patented), control accuracy, full-access rotor chambers, and a rugged motor that gives you power in reserve even at maximum speeds. Safety is a major factor. The SS-3 is a "set it and forget it" instrument; the control panel of the SS-4 snaps out for remote operation. For fully descriptive literature and price list, write Ivan Sorvall, Inc. Norwalk, Connecticut 06856.

## SORVALL®



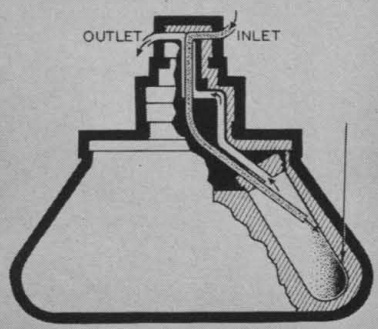
**SS-3 Automatic Superspeed Centrifuge**  
RCF's to 34,800 x g —  
Speeds to 17,000 rpm

Write for Bulletin SC-955-3/4



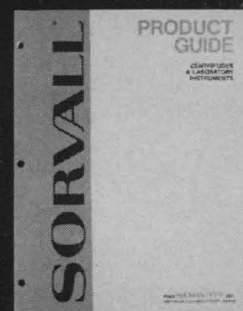
### SS-1 SUPERSPEED ANGLE CENTRIFUGE

RCF's to 31,000 x G — Speeds to 16,000 RPM. The original "workhorse" of the modern laboratory and still going strong. Adaptable to Continuous Flow Collection.



### "SZENT-GYORGYI & BLUM" KSB TUBE-TYPE CONTINUOUS FLOW SYSTEM

Collection in 8, 4, or 2 tubes — up to 48,200 x G may be applied. For use with SORVALL SS-1, SS-3, SS-4, and RC2-B Centrifuges.



### PRODUCT GUIDE

A guide to all SORVALL centrifuges and laboratory instruments. Sent with comprehensive 28-page Price List.

# Abstracts of the 1969 Symposium in Molecular Biology

Available from  
MILES LABORATORIES, INC.

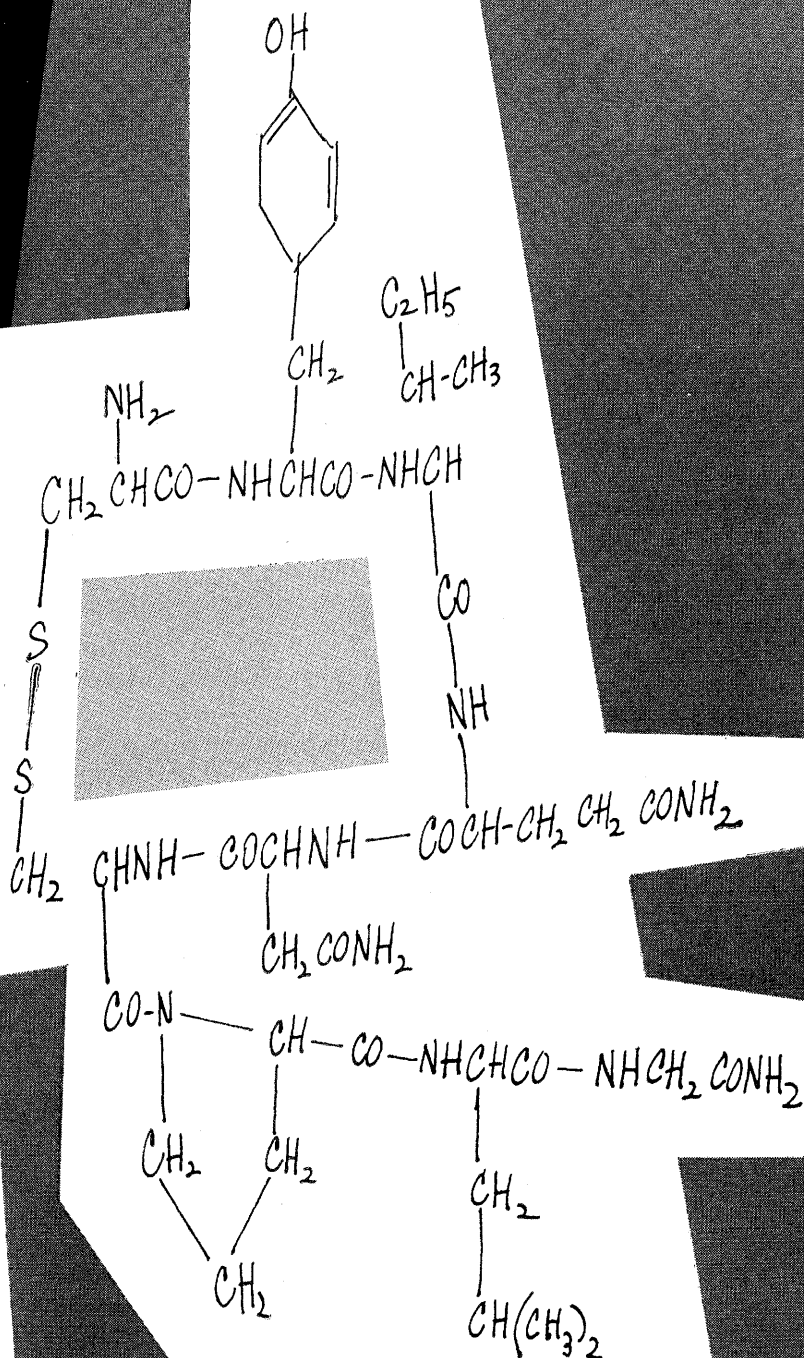
To many scientists throughout the world, Miles Laboratories in Elkhart, Indiana has since 1961 come to mean advanced products for research in Molecular Biology.

Through its Research Products Division, Miles serves the scientific community by generating critical materials required by researchers in health and nutrition—molecular biologicals, immunochemicals, isotopically labeled compounds, enzymes and substrates and reagents for protein chemistry.

Recently over 600 life-scientists from many parts of the world attended the third annual International Symposium in Molecular Biology sponsored by Miles Laboratories. This meeting brought together the world's foremost authorities on the immunological aspects of polypeptides and nucleic acids (DNA and RNA) in living systems.

For a program with abstracts of the 1969 Symposium entitled "POLYPEPTIDES: Their Enzymatic and Chemical Synthesis; Their Role in Immunological Processes," write Miles Laboratories, Inc., Research Products Division, Elkhart, Indiana, U.S.A., 46514.

(By the way, we also make professional pharmaceuticals, chemical and biological information systems, electronic medical instruments, chemicals, household products and proprietary pharmaceuticals such as ALKA-SELTZER and ONE-A-DAY (Brand) vitamins.)



**MILES LABORATORIES, INC.**

RESEARCH PRODUCTS DIVISION  
Elkhart, Indiana

# DIRECT LINEAR ABSORBANCE READOUT

# DIRECT LINEAR ABSORBANCE READOUT

# DIRECT LINEAR ABSORBANCE READOUT

# DIRECT LINEAR ABSORBANCE READOUT

# DIRECT LINEAR ABSORBANCE READOUT



**New from Coleman—fast-scanning Double-beam, UV-VIS Spectrophotometer with LINEAR absorbance readout.**

Coleman's Model 124 brings you rapid scanning speeds and the *only* linear absorbance readout ever offered in a low-cost, double-beam, grating instrument.

With the new Model 124 Hitachi Spectrophotometer you can now do fully automatic ratio recording in the 190 to 800  $m\mu$  range, *without logarithmic scales*. Model 124 presentation is linear in both absorbance and transmittance. Now, for the first time, you get maximum readability with *both* high and low absorbance values. You can obtain readings in 0 to 2.0 absorbance, or expand your readings with the 0 to 1.0 absorbance range.

You'll get three times as much work done, too. Model 124 operates at four scanning speeds up to 240  $m\mu$  per minute. Scans the entire visible range in less than two minutes, with performance comparable to that of slower scanning instruments.

There's much more to Model 124. Plug-in, solid-state circuitry. Automatic filter system. A large sample compartment that accepts cells up to 100 mm. Quick switching to single-beam manual operation. A new, companion Model 165 Linear Recorder that matches the speed, precision and linearity of Model 124.

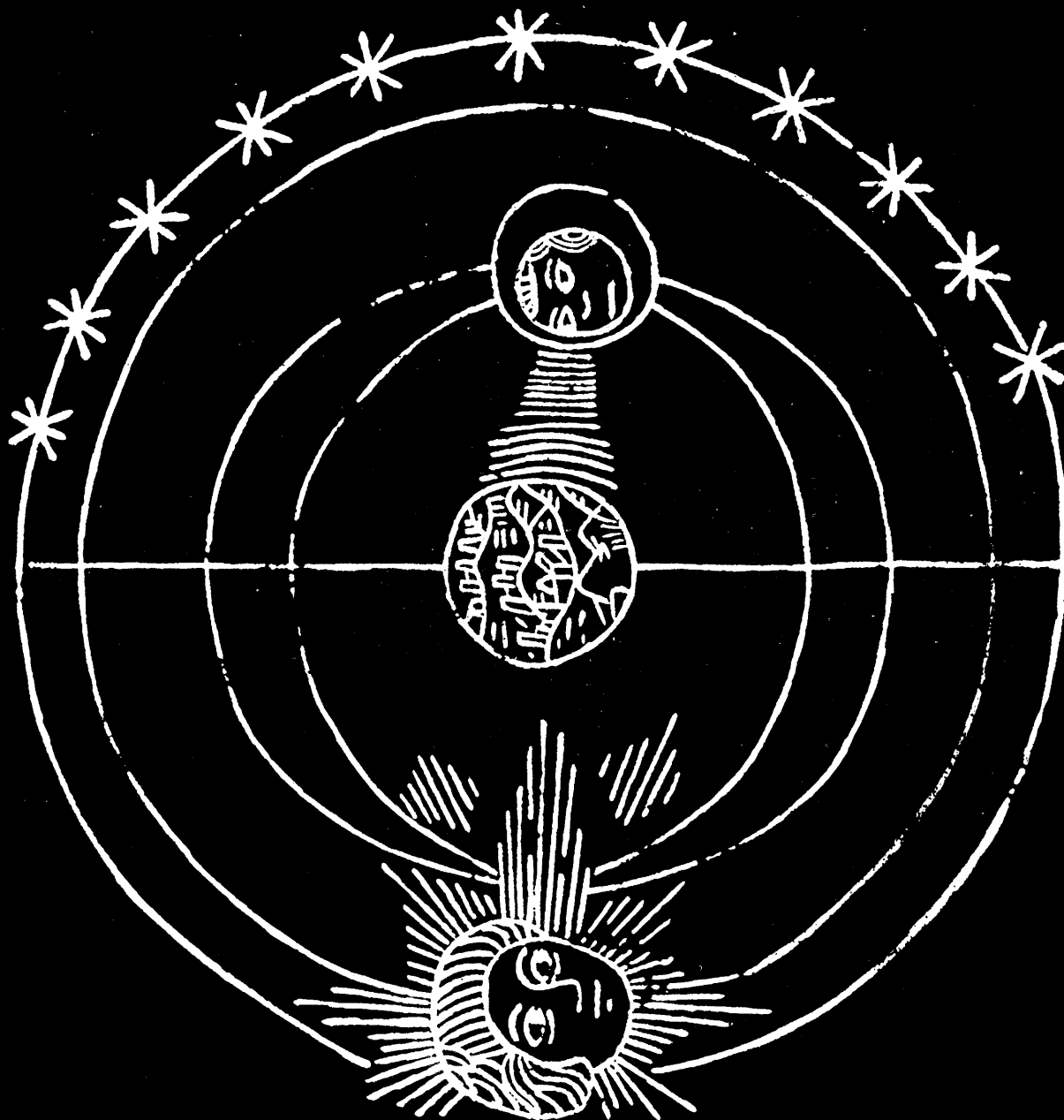
Learn more about the outstanding performance characteristics of this new spectrophotometer, available in two ranges—190 to 700  $m\mu$  and 190 to 800  $m\mu$ . Send today for Coleman Bulletin S-312.

"VISIT OUR BOOTH—A.C.S. MEETING—NEW YORK"

**Write to Coleman Instruments Division,  
The Perkin-Elmer Corporation,  
42 Madison St., Maywood, Illinois 60153**

**PERKIN-ELMER**





# AAAS-WESTINGHOUSE SCIENCE WRITING AWARDS 1969

To encourage and recognize outstanding writing on the natural sciences and their engineering and technological applications (excluding medicine) in newspapers and general circulation magazines.

Three awards of \$1000 each for science writing: in newspapers with daily circulation of over 100,000; in newspapers with daily circulation of less than 100,000; in general circulation magazines.

Contest year. Material must have been published within the United States, October 1, 1968, through September 30, 1969.

Deadline date for submitting entries is October 10, 1969.

For entry blanks and detailed rules, contact Grayce A. Finger, Dept. W, American Association for the Advancement of Science, 1515 Massachusetts Avenue, N.W., Washington, D.C. 20005.

Now you don't have to wait until you can afford an expensive multiple sample automatic counter before you start liquid scintillation counting. The new  $\beta$ -Mate I and  $\beta$ -Mate II are high performance, single sample, soft-beta counting spectrophotometers that do the job for a price you can afford.

$\beta$ -Mate I is ideal for teaching nuclear counting and tracer techniques, using the same procedures as if the student were using

a 200-sample, automatic liquid scintillation counting system.

$\beta$ -Mate II is a research instrument which offers the highest guaranteed analytical specifications available for single sample, manual, soft-beta particle counters.

Both models combine the utmost simplicity and economy with the latest counting techniques. Either way,  $\beta$ -Mate I or  $\beta$ -Mate II, it's good news for your laboratory.

The kind of news you'd expect to come from Beckman, the leader in liquid scintillation.

To receive all the specifications, write for Data File 405, Scientific Instruments Division, Beckman Instruments, Inc., 2500 Harbor Blvd., Fullerton, Calif. 92634.

**Beckman®**

INSTRUMENTS, INC.

INTERNATIONAL SUBSIDIARIES: AMSTERDAM; CAPE TOWN; GENEVA; GLENROTHES, SCOTLAND; LONDON; MEXICO CITY; MUNICH; PARIS; STOCKHOLM; TOKYO; VIENNA

## New $\beta$ -Mate.™ Shortcut to liquid scintillation.



# Our scanning microscope has a lot less to it than our competition's.

*Two lenses instead of three. So there's less difficulty lining things up. And less loss of intensity, once they're lined up.*

*Less waiting to change specimens. Because they pass through our air lock in under 30 seconds. Leaving contamination outside the instrument, where it belongs.*

*Less time finding what you're looking for with our TV scan.*

*Less guessing about specimen composition with our x-ray detector.*

*Less fiddling with specimens. Our goniometer stage lets you tilt and rotate the sample, without touching the focus.*

*It has fewer knobs. So it takes less time to learn how easy it is to operate.*

*Needs less floor space. As it's mostly solid state.*

Now wait till you see how much more you can do with so much less.

Like using our transmitted electron detector. To observe intricate internal structures.

Or viewing the continuous image on our unique TV scan. For more rapid specimen examination.

Or putting our expert x-ray detector to work. To give you a complete spectrum analysis. All in one step.

Or adding other stages in seconds. To run more special projects.

And that's our JSM-2. More or less.

**jeolco**

U.S.A. INC. ELECTRON OPTICS DIVISION  
477 Riverside Avenue, Medford, Massachusetts 02155/Telephone (617) 396-6021

Circle No. 8 on Readers' Service Card

Circle No. 38 on Readers' Service Card →



## Facts.

# The Mark 260 delivers more of them...with less fuss, bother and cost...than any other oscillograph you can buy.

Facts start with accuracy.

And the Mark 260 is about as accurate as you can get. We *guarantee* 99½%. So when you're looking at the chart of a Mark 260, what you see, is fact. We owe it all to a fool-proof position feedback system that enforces pen position all the way across the chart. There are no springs, no strings. Or any of the other tricky mechanisms that you'll suffer with in other recorders.

Those traces you see are a lot more than just accurate. They're crisp and clear and reliable from one edge of the chart to the other. They won't smudge or smear. (And you can chalk that up to a patented pressurized ink-

writing system that puts the trace into the paper and not just on it.)

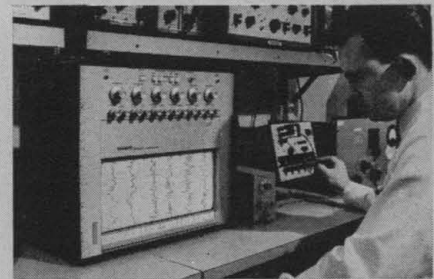
You can forget about recalibration problems, too. We took care of that little nuisance at the factory. So change those settings to your heart's delight. The Mark 260 will keep right up with you. And save you piles of time and piles of chart paper in the bargain.

That's what you get with a Mark 260. It's the go-anywhere, do-anything 6-channel recorder by Brush. At a price per channel that will surprise you.

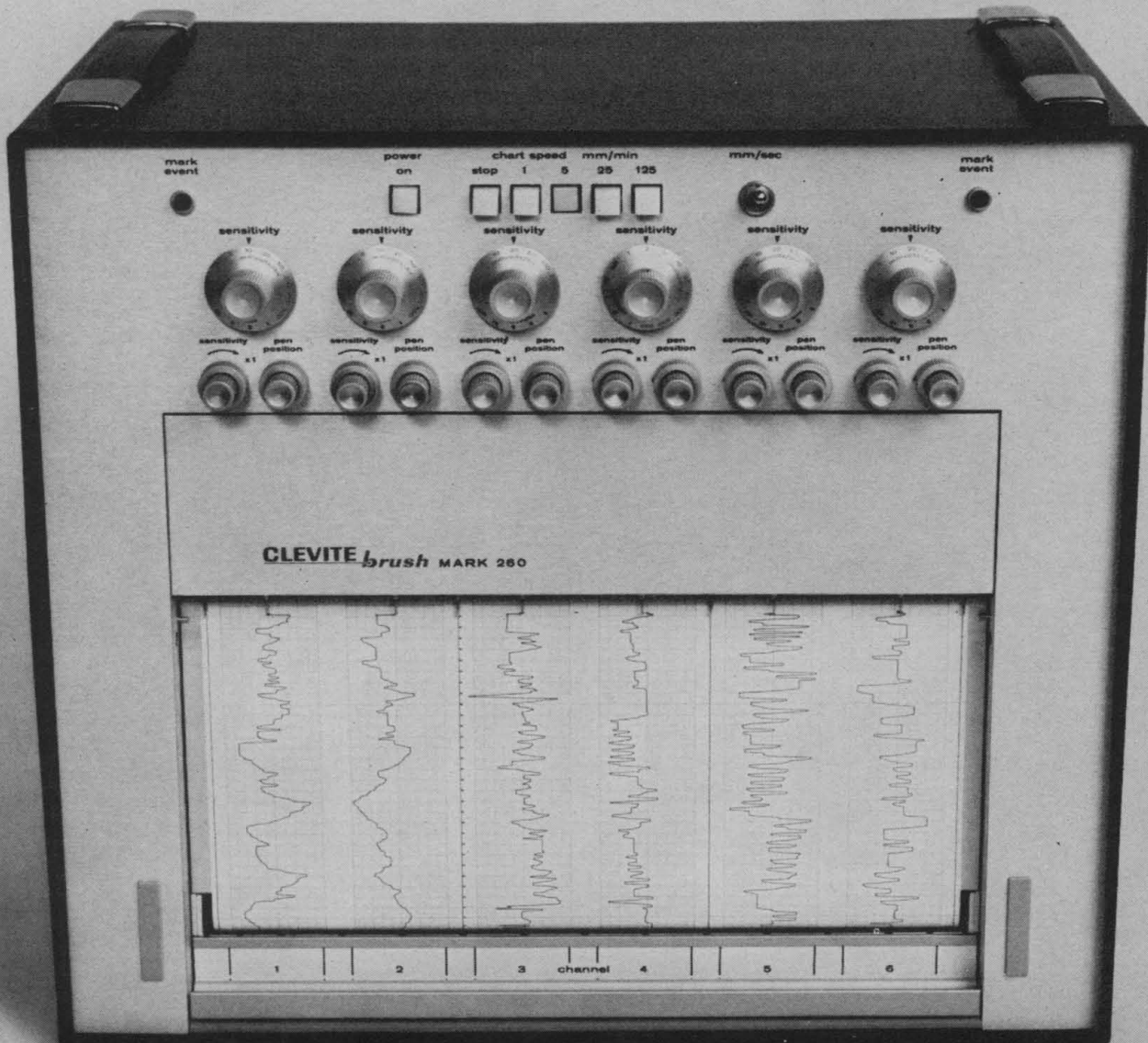
More facts. Less fuss, bother and cost.

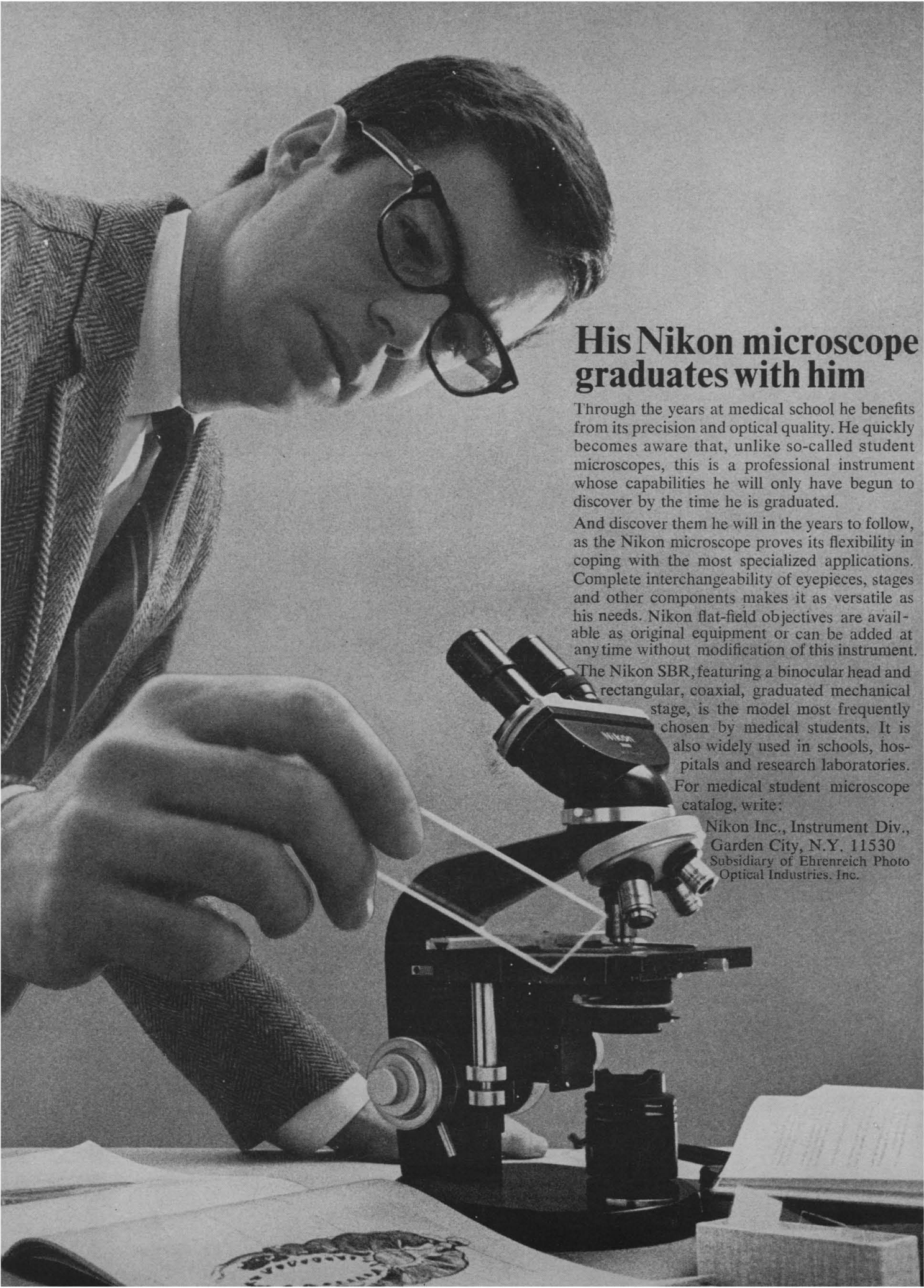
Ask your Brush representative for a demonstration. Or write for Mark 260

Bulletin 942-2: Clevite Corporation, Brush Instruments Division, 37th and Perkins, Cleveland, Ohio 44114. We'll include one of the most comprehensive handbooks on signal conditioning you'll ever find.



**CLEVITE BRUSH**





## His Nikon microscope graduates with him

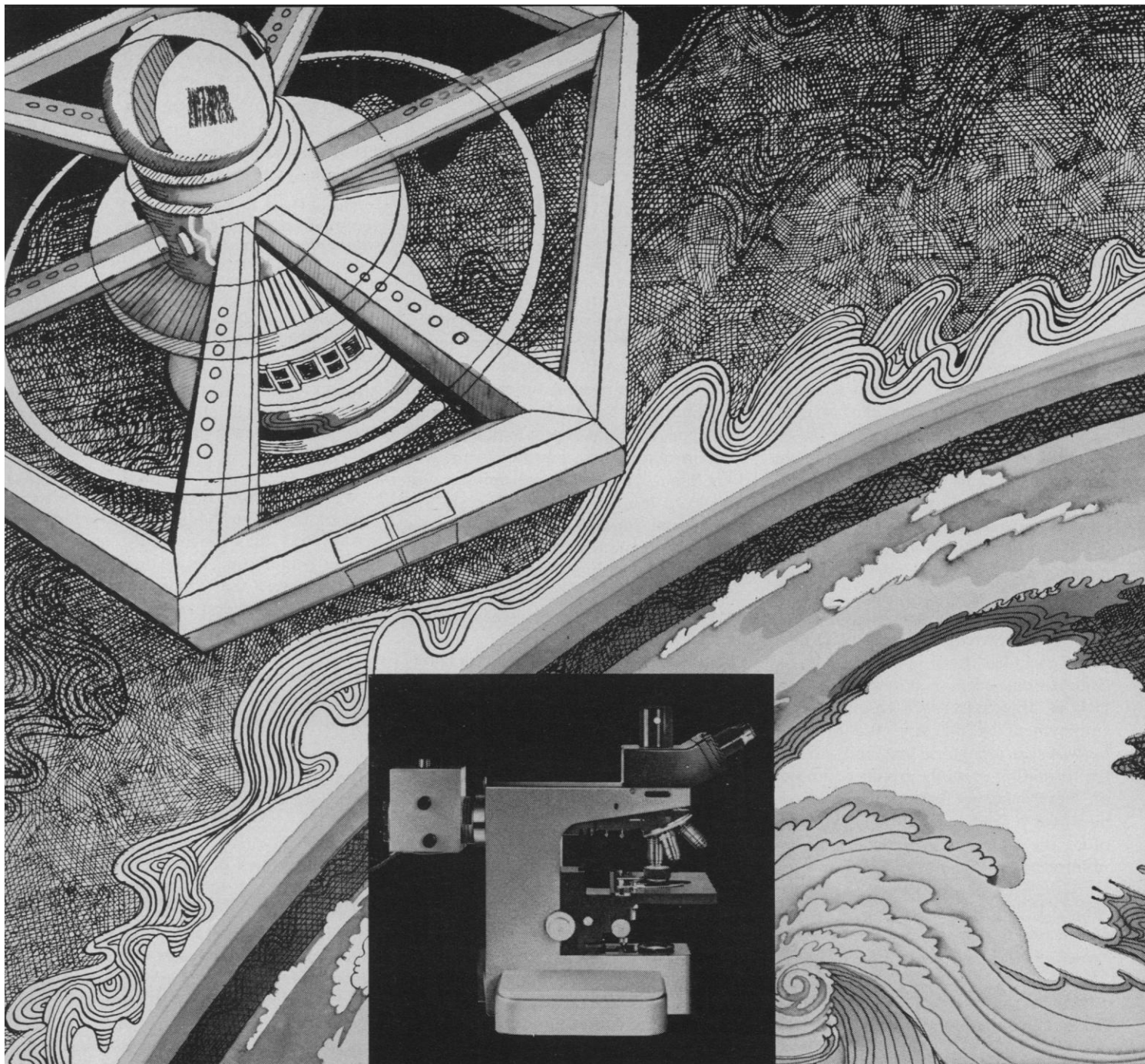
Through the years at medical school he benefits from its precision and optical quality. He quickly becomes aware that, unlike so-called student microscopes, this is a professional instrument whose capabilities he will only have begun to discover by the time he is graduated.

And discover them he will in the years to follow, as the Nikon microscope proves its flexibility in coping with the most specialized applications. Complete interchangeability of eyepieces, stages and other components makes it as versatile as his needs. Nikon flat-field objectives are available as original equipment or can be added at any time without modification of this instrument.

The Nikon SBR, featuring a binocular head and rectangular, coaxial, graduated mechanical stage, is the model most frequently chosen by medical students. It is also widely used in schools, hospitals and research laboratories. For medical student microscope catalog, write:

Nikon Inc., Instrument Div.,  
Garden City, N.Y. 11530  
Subsidiary of Ehrenreich Photo  
Optical Industries, Inc.





## This 1969 microscope is so versatile it will take 1979 accessories.

And 1989 accessories, too. We make sure the ORTHOPLAN *never* becomes obsolete by constantly developing new accessories for it.

Right now, the ORTHOPLAN takes plano objective lenses for biological and metallurgical applications, transmitted-light dark-field and incident-light dark-field attachments, photomicrographic accessories for 35 mm, 4" x 5" or Polaroid. And it also takes different light sources—halogen and xenon, for example.

These are just a few of the available attachments that make this fine microscope the most versatile you can buy for your research.

The ORTHOPLAN stand is massive, rigid,

and is specially designed so when you attach accessories like lamp housings, illuminators and camera equipment, they become an *integral* part of the microscope—and don't extend out in every direction.

The field of view is up to 2½ times greater than that of conventional wide-field microscopes. It's flat, *edge to edge*, and the image is superb, thanks to the famous Leitz plano objectives.

For more information, write:

**Leitz**

E. Leitz, Inc.,  
468 Park Avenue South, N.Y., N.Y. 10016



# 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

1969

EMIL HAURY	KENNETH S. PITZER
WILLARD F. LIBBY	ALEXANDER RICH
EVERETT I. MENDELSON	CLARENCE M. ZENER
JOHN R. PIERCE	

1970

GUSTAF O. ARRHENIUS	RICHARD C. LEWONTIN
FRED R. EGGAN	ALFRED O. C. NIER
HARRY F. HARLOW	FRANK W. PUTNAM
MILTON HARRIS	

## Editorial Staff

### Editor

PHILIP H. ABELSON

### Publisher

DAEL WOLFLE

### Business Manager

HANS NUSSBAUM

Managing Editor: ROBERT V. ORMES

Assistant Editors: ELLEN E. MURPHY, JOHN E. RINGLE

Assistant to the Editor: NANCY TEIMOURIAN

News Editor: JOHN WALSH

Foreign Editor: DANIEL S. GREENBERG\*

News and Comment: LUTHER J. CARTER, BRYCE NELSON, PHILIP M. BOFFEY, MARK W. OBERLE, MARTI MUELLER, SCHERRAINE MACK

Book Reviews: SYLVIA EBERHART

Editorial Assistants: JOANNE BELK, ISABELLA BOULDIN, ELEANORE BUTZ, HELEN CARTER, GRAYCE FINGER, NANCY HAMILTON, OLIVER HEATWOLE, ANNE HOLDSWORTH, PAULA LECKY, KATHERINE LIVINGSTON, VIRGINIA NUSSLE, SANDRA RATTLE, PATRICIA ROWE, LEAH RYAN, LOIS SCHMITT, BARBARA SHEFFER, RICHARD SOMMER, YA LI SWIGART, ALICE THEILE

\* European Office: 22 Mulberry Walk, London, S.W. 3, England (Telephone: 352-9749)

## Advertising Staff

### Director

EARL J. SCHERAGO

### Production Manager

KAY GOLDSTEIN

Advertising Sales Manager: RICHARD L. CHARLES

Sales: NEW YORK, N.Y. 10036: Robert S. Bugbee, 11 W. 42 St. (212-PE-6-1858); SCOTCH PLAINS, N.J. 07076: C. Richard Callis, 12 Unami Lane (201-889-4873); MEDFIELD, MASS. 02052: Richard M. Ezequille, 4 Rolling Lane (617-444-1439); CHICAGO, ILL. 60611: Herbert L. Burkland, Room 2107, 919 N. Michigan Ave. (312-DE-7-4973); BEVERLY HILLS, CALIF. 90211: Winn Nance, 111 N. La Cienega Blvd. (213-657-2772).

EDITORIAL CORRESPONDENCE: 1515 Massachusetts Ave., NW, Washington, D.C. 20005. Phone: 202-387-7171. Cable: Advancesci, Washington. Copies of "Instructions for Contributors" can be obtained from the editorial office. See also page 7, *Science*, 4 July 1969. ADVERTISING CORRESPONDENCE: Rm. 1740, 11 W. 42 St., New York, N.Y. 10036. Phone: 212-PE-6-1858.

## Potomac Valley Test Facility

If we had had the foresight a few years ago to establish the Potomac Valley Test Facility, several recent national problems could have been handled more satisfactorily. An example was the problem of what to do with a large supply of unwanted poison gas in Colorado. The Army proposed to ship it by train to the East Coast and then to dump it at sea off the coast of New Jersey. Had the Potomac Valley Test Facility been in existence, several containers of the gas could have been dropped into the Potomac River, between the White House and the Pentagon, from an altitude calculated to give the impact velocity expected at sea bottom. Dropping a few containers into the Potomac River would have given congressmen, Army officials, and other interested persons an opportunity to observe at first hand whether the containers survived unharmed, and if they did not, the rate of leakage of the gas and its effects on the neighboring flora and fauna. Nothing quite takes the place of direct, personal experience in evaluating an event and its consequences. The nation's central decision makers should not be denied this experience.

More recently, the Edgewood Arsenal and Fort McClellan have suspended open-air testing of nerve gas until a team of scientists can determine whether such tests are as free from danger as they are reputed to be. The National Academy of Sciences, which is frequently asked to advise the government on difficult technical matters, has its headquarters in Washington. Also nearby are the National Bureau of Standards, the Food and Drug Administration, and other agencies that can provide much technical information and relevant expertise. If open-air tests of nerve gas were conducted in or near Washington, representatives of appropriate agencies and of interested congressional committees could easily obtain the firsthand information which they will no doubt wish to have in evaluating the possible hazards of testing such gases in or near inhabited areas.

Another use of the Potomac Valley Test Facility would be in conducting studies of the sonic boom. Sonic boom tests have already been carried out in several parts of the country, but the test sites have been remote from Washington, and there is still considerable disagreement over the extent of the disturbance and the willingness of the public to accept repeated sonic booms. Again, firsthand information would be useful to the decision makers. If repeated tests were conducted over Washington, members of Congress and officials of responsible Executive agencies could observe the effects on babies, pets, the sick and the elderly, on classrooms and conferences, and also on window panes and other fragile objects. They could learn for themselves just how much or little disturbance repeated sonic booms produce at various times of day and night.

There would be still other advantages of having a general-purpose test facility located in Washington. Studies of the time-zone effect indicate that physiological disturbances, loss of sleep, reduced effectiveness, and impaired judgment follow sudden transportation from a time zone to which a person is adapted to another, several time zones removed. However, there are individual differences in these effects, and the whole matter needs further study. Washington is full of people who make frequent trips to Europe, Africa, the West Coast, or Asia. Clearly they would be good subjects for studies of time-zone effects, and their number could readily be increased, for it would be easy to get nominations of politicians, bureaucrats, editorial writers, and others whose frequent or prolonged absence from Washington would be considered by many to be in the national interest.—DAEL WOLFLE

A black and white photograph of a man in a lab coat and tie, looking directly at the camera. He is holding a large, circular centrifuge rotor. To his right is a control panel with several knobs and switches. The background is dark and indistinct.

Call us on it.

# Move up to zonals with the greatest of ease.

IEC's systems approach makes it easy to move up to zonals.

Because our system stresses interchangeability. You start with the most complete choice of zonal rotors. All completely interchangeable. Plus a complete, interchangeable effluent and feed seal, seal cap, glassware kit, tool kit, and spare parts kit. So you're always sure you have what you need.

Next, you can get zonal capability

in a choice of centrifuges that includes low and high speed refrigerated models, and ultra centrifuges. All capable of handling a variety of zonal, fixed-angle, or swinging-bucket rotors. So your centrifuge investment is always protected. And units in the field can quickly be modified right in your lab.

Finally you get all the help you need from our staff of experts and our fully-equipped applications lab.

To find out how easy it is to take advantage of zonals for research or for routine preparative works, write us at 300 Second Ave., Needham Heights, Mass. 02194. Ask for our free 20-page, full-color zonal brochure. Or call Tom Mulvihill at (617) 444-6700, collect.



**INTERNATIONAL  
EQUIPMENT CO.**  
A DIVISION OF DAMON



## LIMITED TIME ONLY...

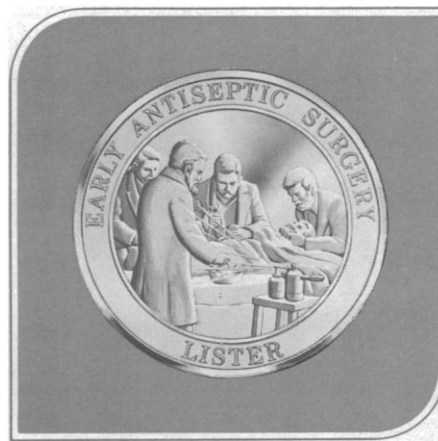
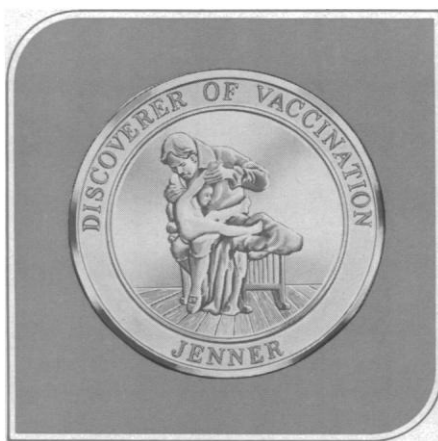
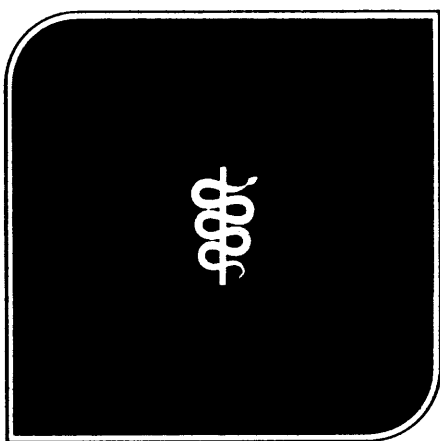
*Until September 21, 1969,  
the Medical Heritage Society  
offers you a once in a lifetime opportunity  
to acquire the world's first  
proof quality art medals  
honoring great achievements  
in medicine.*





The  
Medical Heritage Society  
Announces

# THE MEDALLIC HISTORY OF MEDICINE



## **The History of Medicine is the History of Man**

From antiquity, the physician—the healer—has played a central role in the history of man. Indeed, in earlier societies, the physician was venerated for his "magical" powers, and considered godlike.

Recognizing the creative aspects of medical progress, the Medical Heritage Society has undertaken a uniquely elegant creative tribute to this progress in a classic form of art . . . the bas relief Art Medal.

## **Commemorates Sixty Significant Medical Achievements**

The history of medicine is so rich in momentous events that it required months of scholarly research by our advisory board to select the sixty most significant events. Included are such high points as the discovery of blood circulation, the development of anesthesia, and the invention of the microscope . . . the highlights of medical history from Hippocrates and Galen to Pasteur and Freud. These achievements have been artistically interpreted in bas relief, engraved in meticulous detail—and will be minted in Proof Sets of Solid Platinum, Sterling Silver, and Solid Bronze. Each medal is 39 millimeters in diameter—larger and thicker than a silver dollar.

## **This Rare Series is Certain To Become a Treasured Heirloom**

Though the prices of precious metals fluctuate, even conservative experts predict that they are in long-term uptrends. This has clear implications for the future value of the Medallion History of Medicine series

—aside from its artistic value. Your investment is further protected by the exclusivity of this offering. No subscriptions postmarked after September 21, 1969 will be accepted. *And absolutely no additional Proof-Quality Sets will be struck.*

## **Long-Term Price Protection**

The price of the Sterling Silver Edition is guaranteed for the entire series—30 months. You are protected even if the price of silver increases to the point where the silver content of the medals is worth more than the price charged you.

We are able to provide you this unusual protection by contracting in advance for enough silver bullion to cover the entire series at the current market price. We will purchase and set aside, *for each Advance Subscriber*, a sufficient amount of silver or bronze to provide in advance for his entire series of sixty medals.

In the case of Solid Platinum medals, price protection can be offered only to the extent that the subscriber is willing to share in the bullion investment. Further details on this plan will be sent to those Advance Subscribers who choose Solid Platinum medals.

## **Limited Number of Sets To Be Minted**

Due to the substantial bullion investment required for this series, only a limited number of Advance Subscriptions will be accepted. This limit will be determined by the price of silver during the month of September 1969. This means that all Advance Subscription Applications are sub-

ject to acceptance in the sequence they are received. Participation cannot be guaranteed, so early application is advisable.

## **Bonus Medal Given To Early Charter Subscribers**

The Medical Heritage Society will recognize the early participation of all Charter Subscribers by arranging for a special medal to be minted honoring Aesculapius, the Greek god of healing. Only Subscription Applications postmarked by September 14, 1969 (one week before all subscription rolls close) are eligible to receive this medal. These Charter Subscribers will receive this medal without additional charge in the metal corresponding to their subscription. Each special medal will arrive in a beautiful case suitable for presentation or display.

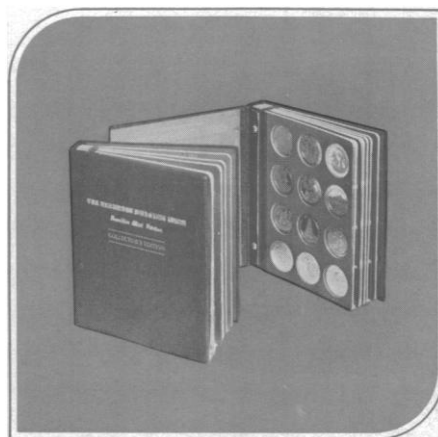
## **Handsome Display Portfolio Provided**

With your third monthly pair of medals, you will also receive without additional cost a handsome display portfolio. This portfolio has individual pockets for each medal and it offers an organized and convenient way to protect and display your entire Proof Set.

## **Historical Reference Folder Accompanies Each Medal**

A brief description of the person or event commemorated by each medal will be included with every medal in the series. These descriptions will give a brief history relating to the medal and will enrich your appreciation of the exciting and dynamic heritage of medicine.

**Sixty Milestones in Medical History Commemorated for Posterity  
in your Choice of Solid Platinum, Sterling Silver or Solid Bronze  
Hallmarked Limited Edition Proof Sets Available by Advance Subscription Only  
Limited: One proof set per subscriber / Subscription rolls close September 21, 1969  
Proof Sets of this magnificent first edition series will never again be minted**



**Hallmarked, Proof-Quality, Limited Edition: What Do They Mean?**

Rarity is inevitably a component of value. And the Medical Heritage Society assures the rarity of its Medallie History of Medicine series by issuing it hallmarked, in proof quality, and in limited edition.

*Hallmarked* medals carry edgemarkings to identify the issuing mint and the metal and finish in which the medal is struck. A mark of exclusivity.

*Proof-Quality* medals are individually minted from specially polished dies. The careful attention given to their minting and finishing produces exceptionally beautiful specimens with softly frosted highlights on a mirror finish background. Proof Quality is the ultimate in medallie art—worthy of a place in the most elegant collections. And only one Proof-Quality Edition in each of the three metals will ever be struck from these dies. Another mark of exclusivity.

*Limited Edition*, in this instance, means that the number of sets is limited to the number of Advance Subscribers. In the case of the Solid Platinum and Sterling Silver editions, each subscriber receives a subscription number—assigned in the order subscriptions are received. That same number is then struck on the edge of every medal he receives. A very personal mark of exclusivity.

**Medallie History of Medicine To Be Minted By The Franklin Mint**

The Franklin Mint of Yeadon, Pennsylvania, is the largest and foremost private mint in the world. Its staff includes the finest craftsmen and minting talent available

anywhere. Coins and medals struck by The Franklin Mint are world renowned, and are unsurpassed for quality and beauty.

**Early Action Will Assure Your Participation**

Because only a limited number of sets will be minted and many subscriptions may have to be turned down, we recommend that you order today to assure your participation in this valuable and historic series. Participation in this enterprise offers you the satisfaction of being associated

with a project of this importance. It also offers the excitement of possessing an artistic—and intrinsically valuable—portrayal of the great moments of medical history.

You will get the pleasure of systematically building a magnificent collection of art, and the feeling of security that goes with accumulating a "private treasury" of heirlooms in precious metal at a guaranteed price. Fill out and mail the enclosed order form now, and assure yourself ownership of this uniquely valuable series on medical history.

**ADVANCE SUBSCRIPTION APPLICATION**

**Must be Postmarked By September 21, 1969**

**LIMIT: ONE PROOF SET PER SUBSCRIBER**

**Medical Heritage Society · Suite 1529B · 20 North Wacker Drive · Chicago, Illinois 60606**

Please enter my subscription for one complete Hallmarked Proof Set of the MEDALLIC HISTORY OF MEDICINE, consisting of sixty medals, to be issued at the rate of two per month, beginning October 1969. I would like my set to be struck in:

☐ Sterling Silver at \$12.50\* ea.      ☐ Solid Bronze at \$4.50\* ea.      ☐ Solid Platinum at \$1180.00\* ea.

If my subscription is accepted, I understand that these medals will be struck expressly for my account. And I agree to pay for each two medals promptly on being invoiced on a monthly prepayment basis. I will also receive, at no additional cost, a deluxe album to organize and protect my medals. The album will be sent after I have received six medals. In addition, if my Application is postmarked by September 14, 1969 (one week before all subscription rolls close), I will receive the bonus medal minted in the same metal as my series.

Enclosed is my remittance to cover the first two medals:

☐ Sterling Silver \$25.00\*      ☐ Solid Bronze \$9.00\*      ☐ Solid Platinum \$2380.00\*

I understand my remittance will be returned to me by September 30, 1969, if my subscription is not accepted.

\*Residents of Illinois add 5% State Sales Tax.

Name \_\_\_\_\_

Address \_\_\_\_\_

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

Signature \_\_\_\_\_ Date \_\_\_\_\_



## THE DISTINGUISHED BOARD OF ADVISORS FOR The Medallie History of Medicine

### **L. R. C. AGNEW, M.D.**

Associate Professor of Medical History, University of California, Los Angeles. Medical Historical Consultant for the 24th edition of *Dorland's Illustrated Medical Dictionary*. Author of medical history articles for the *New Catholic Encyclopedia* and *Encyclopedia Americana*. Currently engaged in the preparation of medical historical teaching films.



### **JOHN DUFFY, Ph.D.**

Professor of the History of Medicine, Tulane University. Member of many professional organizations, including the American Institute for the History of Pharmacy (Committee Member) and the American Association of the History of Medicine. Author of numerous books and articles related to the history of medicine. Recipient of many awards, including the Louisiana Library Association Literary Award.

### **WILLIAM K. BEATTY, M.S.**

Librarian and Professor of Medical Bibliography, Northwestern University Medical School. Member of such professional organizations as the American Association for the History of Medicine. Former Director of the Medical Library Association and the Special Libraries Association. Contributing author to various professional journals. Book Review Editor for *Journal of Medical Education*.



### **LESTER S. KING, M.D.**

Senior Editor of the *Journal of the American Medical Association*; Professorial Lecturer in the History of Medicine, University of Chicago. Author of many periodical articles and books, including *The Medical World of the Eighteenth Century* and *The Growth of Medical Thought*, published by the University of Chicago press. Recipient of the Boerhaave Medal from the University of Leiden. Chairman, Medical Heritage Society Advisory Board.

### **CHARLES W. BODEMER, Ph.D.**

Professor and Chairman, Department of Biomedical History, School of Medicine, University of Washington. Member of various medical societies, including the American Association for the History of Medicine. Member of the National Science Foundation, Division of History and Philosophy of Science Review Board. Author of numerous papers and articles pertaining to various aspects of the history of medicine.



### **GENEVIEVE MILLER, Ph.D.**

Director of the Howard Dittick Museum of Historical Medicine. Associate Professor of the History of Science, Case Western Reserve University School of Medicine. Her professional organization memberships include American Association for the History of Medicine. Author of several books and articles on various aspects of medical history. Recipient of many awards, including the William H. Welch medal of the American Association for the History of Medicine.

### **RONNIE BETH BUSH, M.A.**

Assistant Professor and Vice-Chairman of the Department of History and Philosophy of Medicine, Chicago Medical School. Josiah Macy, Jr., Fellow in the History of Medicine and the Biological Sciences. Secretary-Treasurer of the Society of the History of Medicine of Chicago. Co-editor of the forthcoming *American Urological Association History of Urology*.



### **PETER D. OLCH, M.D.**

Deputy Chief of the History of Medicine Division of the National Library of Medicine. Organizer and Supervisor of the Oral History Program of the National Library of Medicine. Member of the Executive Committee of the Oral History Association. Author of numerous papers particularly related to the history of surgery.

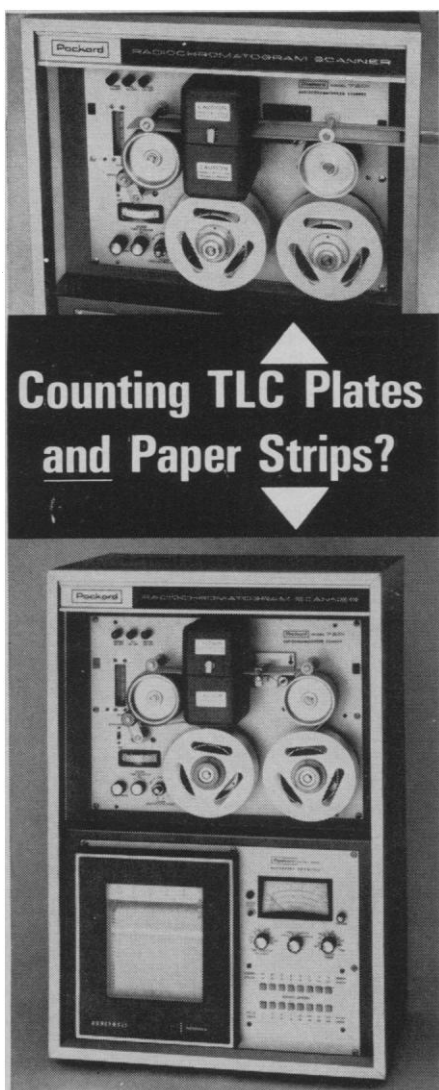


Medical Heritage Society®



TWENTY NORTH WACKER DRIVE, CHICAGO, ILLINOIS 60606 \* SUITE 1529 \* TELEPHONE (312) 641-5540





## This Scanner has a 50-second changeover!

Every Packard Radiochromatogram Scanner is shipped ready to use with either paper strips or TLC plates. Changeover is fast and easy, without complicated adjustments or modifications. And you don't make compromises to count either medium on this scanner; it gives unmatched sensitivity and ease of operation with both strips and plates . . . counts up to four plates unattended. ■ Versatility with chromatography media is just one of the features of a scanner that users have learned is completely reliable under all conditions of use. Others include choice of windowless or window counting, wide range of collimation, pushbutton selection of scanning speeds and ability to handle chromatograms from ½ to 2 inches in width. For complete details contact your Packard Sales Engineer or request Bulletin 1038U from Packard Instrument Company, Inc., 2200 Warrenville Road, Downers Grove, Illinois 60515, or Packard Instrument International S.A., Talstrasse 39, 8001 Zurich, Switzerland.

# Packard

Circle No. 85 on Readers' Service Card

The participants at the conference considered the vastly larger scale of electrostatic phenomena of the earth's atmosphere, from fair weather electricity, involving such effects as electrification from bursting bubbles, snow and dust storms, to the violent electrical activity and intense electric fields associated with thunderstorms and volcano activity.

There was strong agreement that it would be desirable to set up a university-located electrostatics research center, specializing in electrostatics research and development of applied electrostatic techniques. Such a center could establish an electrostatics library and maintain a directory of people working in the diverse areas of electrostatics.

A. D. MOORE

*Department of Electrical Engineering,  
University of Michigan,  
Ann Arbor 48104*

BERNARD VONNEGUT

*Atmospheric Sciences Research Center,  
State University of New York,  
Albany 12203*

## Forthcoming Events

### October

1-3. American Nuclear Soc., San Juan, P.R. (H. Gomberg, Puerto Rico Nuclear Center, Univ. of Puerto Rico, Mayagües 00709)

1-5. American Soc. for Information Science, San Francisco, Calif. (J. E. Bryan, ASIS, 2011 Eye St., NW, Washington, D.C. 20006)

2-5. American Soc. of Human Genetics, San Francisco, Calif. (C. J. Witkop, Jr., 429 Owre Hall, Univ. of Minnesota, Minneapolis 55455)

2-9. Use of Computers in Clinical Medicine, 2nd symp., Buffalo, N.Y. (H. J. Alvis, Associate Dean, Continuing Medical Education, 211 Main St., Buffalo 14214)

5-9. Electrochemical Soc., Detroit, Mich. (E. G. Enck, The Society, 30 E. 42 St., New York 10017)

5-9. Prestressed Concrete Inst., Boston, Mass. (W. B. Bennett, Jr., PCI, 205 W. Wacker Dr., Chicago, Ill. 60606)

5-10. Water Pollution Control Federation, 42nd annual, Dallas, Tex. (R. E. Fuhrman, WPCF, 3900 Wisconsin Ave., NW, Washington, D.C. 20016)

6-8. International Congr. on Antiparasites, 3rd, Milan, Italy. (CONGITA, Via Barberini 86, 00185 Rome, Italy)

6-10. International Seminar on Neoplastic Diseases, Heidelberg, Germany. (R. H. Jackson, 10607 Miles Ave., Cleveland, Ohio 44105)

6-10. Research Equipment Exhibit and Instrument Symp., 19th annual, Bethesda, Md. (J. B. Davis, Chief, Supply Management Bureau, National Institutes of Health,



## Prothrombin Timer Now Has Disposable Sample Vessels

Rapid routine analysis of coagulation times is provided by the automated COLEMAN Prothrombin Timer. It performs all variables of the determination, thereby removing variations in operator technique as a source of error.

The instrument provides a means for incubating, mixing, and agitating the sample and reagent; it also provides electrical sensing and timing of the end point. New models have low cost disposable sample vessels that heat up faster, save clean-up time, and eliminate a cause of premature clotting.

### Simple, Easy Operation

Sample and reagent, pipetted into a sample vessel on the instrument's dry heater plate, quickly reach thermal equilibrium.

The operator then places the vessel in a rocker chamber, installs an electrode bar, and pushes the START button. The instrument automatically completes the determination, shutting off at the nearest half-second, and displaying the results directly in seconds on its timer dial.

The dry heater plate does away completely with troublesome water baths. Its ten positions provide convenience analysis of a large number of consecutive determinations.

### High Reproducibility

Because all critical operations are automated, any qualified laboratory technician can obtain completely reliable results; it is no longer necessary to have all prothrombin time determinations made by a single person. Write to Coleman Instruments Division, Perkin-Elmer Corporation, Maywood, Illinois 60153. Bulletin S-4.

# PERKIN-ELMER

Circle No. 83 on Readers' Service Card

Bldg. 12A, Room 4003, Bethesda 20014)

7-8. Conference on **Automation in Injection Molding**, Cincinnati, Ohio. (R. P. Fox, Soc. of Plastics Engineers, 656 W. Putnam Ave., Greenwich, Conn. 06830)

7-8. Symposium on Recent Progress in **Diabetes and Insulin Research**, Omaha, Neb. (M. A. Mehlman, Dept. of Biochemistry, Univ. of Nebraska, College of Medicine, Omaha 68105)

7-9. Conference on **Environmental Effects on Aircraft and Propulsion Systems**, Bordentown, N.J. (R. A. Bard, Naval Air Propulsion Test Center, P.O. Box 176, 1440 Parkway Ave., Trenton, N.J. 08628)

8-9. Society for **Management Information Systems**, Minneapolis, Minn. (G. W. Dickson, Management Information Systems Research Center, School of Business Administration, Univ. of Minnesota, Minneapolis 55455)

8-10. American Council on **Education**, 52nd annual, Washington, D.C. (F. Skinner, ACE, 1785 Massachusetts Ave., NW, Washington, D.C. 20036)

8-11. National Assoc. of **Biology Teachers**, Philadelphia, Pa. (J. R. Lightner, NABT, 1420 N St., NW, Washington, D.C. 20005)

12-16. American Soc. of **Plastic and Reconstructive Surgeons**, St. Louis, Mo. (P. Randall, The Society, 18 Laughlin Lane, Philadelphia, Pa. 19118)

24-26. **Orton Soc.**, 20th annual, New York, N.Y. (V. A. Graff, The Society, 15 Claremont Ave., New York 10027)

25-29. American Soc. of **Anesthesiologists**, San Francisco, Calif. (W. S. Markinko, 515 Busse Highway, Park Ridge, Ill. 60608)

25-31. American Assoc. of **Medical Record Librarians**, New York, N.Y. (M. Waterstraat, The Association, 211 E. Chicago Ave., Chicago, Ill. 60611)

26-30. Society for **Industrial and Applied Mathematics**, Anaheim, Calif. (R. K. Windsor, 33 S. 17 St., Philadelphia, Pa. 19103)

27-29. Interscience Conf. on **Antimicrobial Agents and Chemotherapy**, 9th, Washington, D.C. (R. W. Sarber, American Soc. for Microbiology, 1913 Eye St., NW, Washington, D.C. 20006)

25-26. International Soc. for **Homotoxicology and Antihomotoxicological Therapy** Symp., Baden-Baden, Germany. (F. Doerper, Bertholdstr. 7, 757 Baden-Baden)

27-30. National **Powerplant Mtg.**, Cleveland, Ohio. (W. I. Marble, 2 Pennsylvania Plaza, New York 10001)

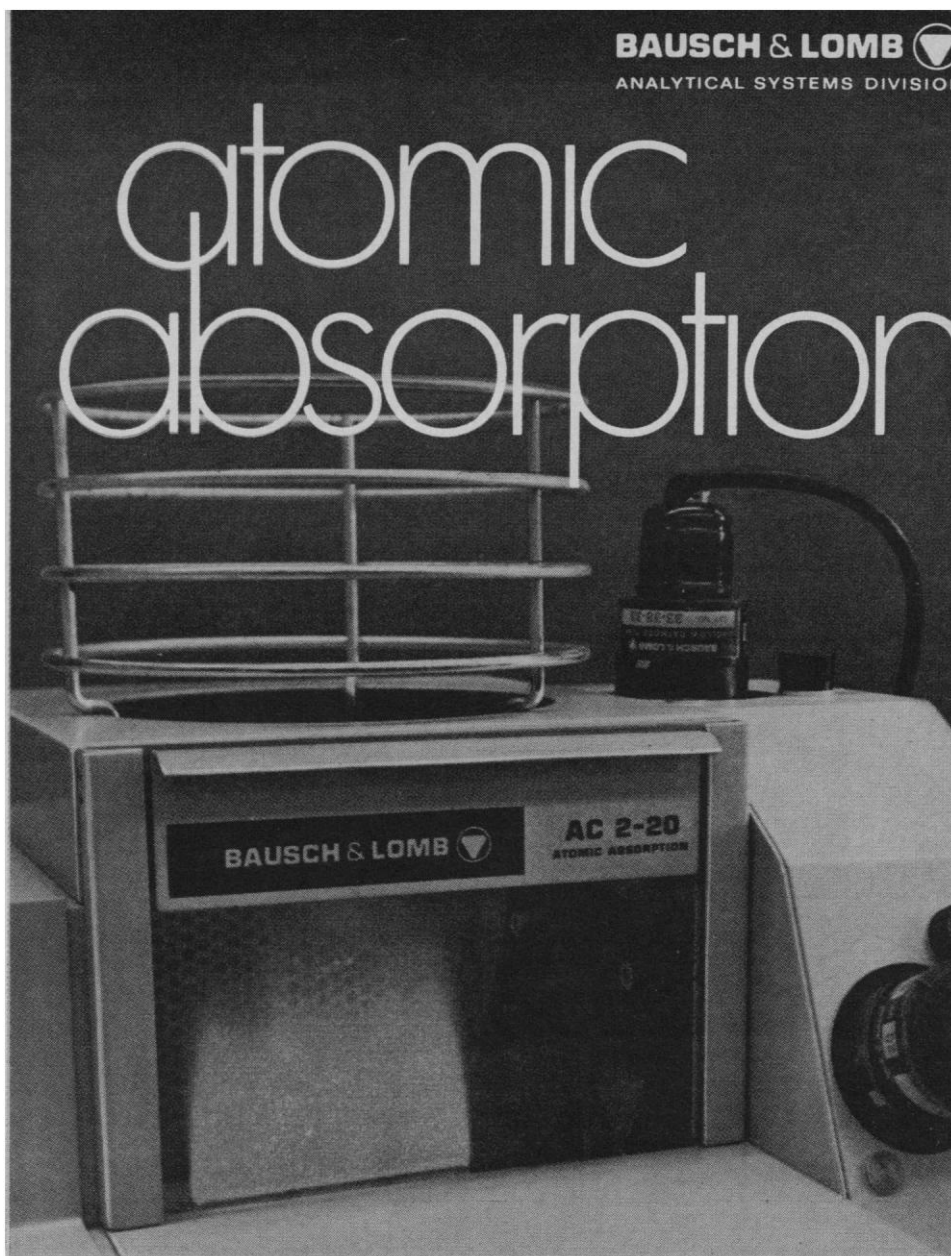
27-30. National **Safety** Congr. and Exposition, Chicago, Ill. (H. W. Champlin, The Congress, 425 N. Michigan Ave., Chicago 60611)

29-31. Symposium on **Pharmacology of Selected Drugs Used in Dermatology: Principles of Action and Uses**, New York, N.Y. (P. Merwin, New York Univ. Medical Center, 550 First Ave., New York 10016)

30-3. Association of American **Medical Colleges**, Cincinnati, Ohio. (D. E. Mattson, Div. of Educational Measurement and Research, AAMC, 2530 Ridge Ave., Evanston, Ill. 60201)

31-2. American Soc. of **Criminology**, Columbus, Ohio. (R. M. Susman, ASC, 800 Fourth St., SW, S-610, Washington, D.C. 20024)

5 SEPTEMBER 1969

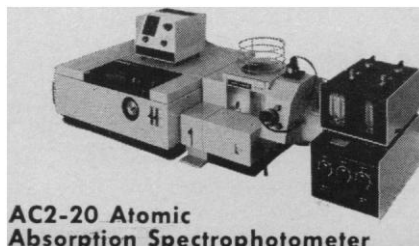


## flame under glass

Flame is enclosed behind a special, tempered glass to eliminate effects of outside air currents and contaminants . . . just one feature in a long list that make the AC2-20 today's most advanced atomic absorption system. It combines safety, versatility, operational convenience and reliability with superior sensitivity and exceptional performance.

### Reliability you can count on

- Finest, high dispersion monochromator (two 1200 lines/mm "Certified-Precision" gratings) assures superior linear dispersion, eliminates adjacent interference lines.
- Wavelength Range—190-800nm



AC2-20 Atomic Absorption Spectrophotometer

- Single pass system utilizes region of highest free atom density; higher signal-to-noise ratio, too.

### Unmatched Operator Convenience

- Three-lamp system with indicator pilot lights, lamp identification, remote switching, easy centering, focusing and interchange. Lamps on standby—no wait for warm-up.
- Flowmeters for both fuel and support gas indicate over entire range, simplify repeatability.
- No flashback in routine operation . . . remote piezoelectric burner ignition.

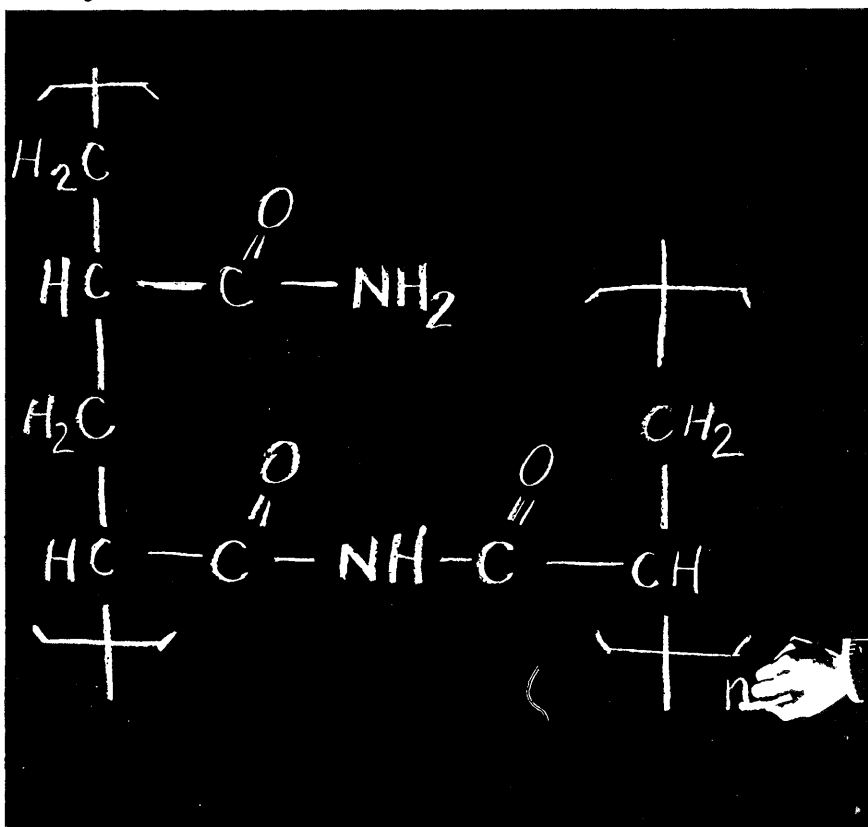
### Outstanding Versatility and Flexibility

- 3-in-1 capability: flame-emission, UV—visible and atomic absorption.

We'll be happy to send you Catalog 33-2225 which has the full story. Analytical Systems Division, Bausch & Lomb, 20721 Bausch Street, Rochester, New York 14602.

Circle No. 27 on Readers' Service Card

one of a series on...



## WHAT REALLY COUNTS IN GEL FILTRATION?

*The composition of your column packing material really counts.*

You have two choices.

You can choose our **Bio-Gel®P**, a series of *polyacrylamide* gels especially designed for separations of aqueous macromolecules below 400,000 molecular weight.

Or for the same molecular weight range, you can choose Sephadex®, which is a modified *dextran* sugar.

The two are as different as night and day.

**Bio-Gel P** is a biologically *non-reactive* hydrophilic gel. It can't contaminate biochemical fractions. It's compatible with all commonly used buffers. Chemisorption is minimal (average figure of free carboxyl groups: 0.00005 meq/dry gram). And it won't support bacterial growth. In other words, **Bio-Gel P** is a physical, not a chemical system.

On the other hand, Sephadex, by its very nature, can and does react with biochemical compounds in addition to being a congenial substrate for bacteria. Its chemisorption is significantly higher than that for **Bio-Gel P**. And unlike **Bio-Gel P**, carbohydrate analysis with Sephadex almost always presents problems since it is itself a carbohydrate.

The non-reactive nature of **Bio-Gel P** is but one clear-cut advantage of Bio-Rad molecular separation materials. To find out more, please write

**BIO-RAD** Laboratories

Dept. S-6

32nd and Griffin Avenue, Richmond, California 94804

**More for gel filtration**

Circle No. 29 on Readers' Service Card

November

2-5. **Atherosclerosis**, 2nd intern. symp., Chicago, Ill. (L. N. Katz, Chicago Heart Assoc., 22 W. Madison St., Chicago 60602)

2-7. **Society of Cosmetic Chemists**, Harriman, N.Y. (A. R. Korte, 521 W. 57 St., New York 10019)

3-4. **Institute of Navigation**, San Diego, Calif. (R. E. Freeman, Inst. of Navigation, Suite 912, 711 14th St., NW, Washington, D.C. 20005)

3-4. **Veterinarians**, 45th annual conf., Columbia, Mo. (F. McCulloch, School of Veterinary Medicine, Univ. of Missouri, Columbia 65201)

3-5. **Engineering Science in Biomedicine**, 7th annual, St. Louis, Mo. (E. Y. Rodin, Dept. of Applied Mathematics and Computer Science, Box 1176, Washington Univ., St. Louis 63130)

3-6. **National Bureau of Standards**, 3rd **Materials Research** Symp., Gaithersburg, Md. (R. R. Stromberg, A-307, Polymers Bldg., NBS, Washington, D.C. 20234)

3-7. **American Soc. of Parasitologists**, Washington, D.C. (D. V. Moore, Dept. of Microbiology, Univ. of Texas, Southwestern Medical School, Dallas 75235)

4-5. **Chemical Marketing Research** Assoc., Toronto, Canada. (P. E. Levesque, FMC Corp., 633 Third Ave., New York 10017)

4-6. **Society of Plastics Engineers**, Dallas, Tex. (C. C. Campbell, SPE, 656 W. Putnam Ave., Greenwich, Conn. 06830)

4-7. **Acoustical Soc. of America**, San Diego, Calif. (B. H. Goodfriend, 335 E. 45 St., New York 10017)

5-7. **Pittsburgh Diffraction Conf.**, 27th, Pittsburgh, Pa. (J. H. Scott, U.S. Steel Research Center, Monroeville, Pa. 15146)

5-8. **American Chemical Soc.**, southeastern regional mtg., Richmond, Va. (H. R. R. Wakeham, Philip Morris Inc., Box 3D, Richmond 23206)

5-8. **Federation of Socs. for Paint Technology**, Chicago, Ill. (R. W. Matlack, 121 S. Broad St., Philadelphia, Pa. 19107)

6-7. **National Symp. on Industrial Robots**, Chicago, Ill. (D. W. Hanify, IIT Research Inst., 10 W. 35 St., Chicago 60616)

6-8. **American Soc. of Cytology**, 17th annual scientific mtg., Chicago, Ill. (W. R. Lang, 7112 Lincoln Dr., Philadelphia, Pa. 19119)

6-8. **American Physical Soc.**, Gainesville, Fla. (W. Seagondollar, Dept. of Physics, North Carolina State Univ., Raleigh 27607)

10-12. **Geological Soc. of America**, Atlantic City, N.J. (R. C. Becker, P.O. Box 1719, Boulder, Colo. 80302)

10-12. **Operations Research Soc. of America**, 36th natl., Miami, Fla. (M. E. Thomas, Dept. of Industrial and Systems Engineering, Univ. of Florida, Gainesville 32601)

10-12. **Paleontological Soc.**, Atlantic City, N.J. (R. L. Langenheim, Jr., Dept. of Geology, Univ. of Illinois, Urbana 61801)

10-14. **American College of Preventive Medicine**, Philadelphia, Pa. (E. A. Piszcsek, 6410 N. Leona Ave., Chicago, Ill. 60646)

10-14. **American Public Health Assoc.**,



97th annual, Philadelphia, Pa. (B. F. Mattison, APHA, 1740 Broadway, New York 10019)

10-14. Technical Conf. on **Tin**, 2nd, Bangkok, Thailand. (W. Fox, Intern. Tin Council, Haymarket House, 28 Haymarket, London, S.W.1., England)

11-13. **Neurosurgical Soc.**, 28th annual, Kyoto, Japan. (H. Handa, Dept. of Neurosurgery, Kyoto Univ., Kyoto)

11-14. **Neutrons in Radiobiology Symp.**, Oak Ridge, Tenn. (J. A. Auxier, Oak Ridge National Lab., P.O. Box X, Oak Ridge 37830)

12-15. **American Speech and Hearing Assoc.**, Chicago, Ill. (K. O. Johnson, APHA, 9030 Old Georgetown Rd., Washington, D.C. 20014)

13-14. **Biochemical Soc.**, Warwick, England. (A. I. P. Henton, 7 Warwick Court, Holborn, London, W.C.1., England)

16-18. **Academy of Psychosomatic Medicine**, Scottsdale, Ariz. (E. Dunlop, The Academy, 150 Emory St., Attleboro, Mass. 02703)

16-19. **Association of Military Surgeons of the U.S.**, Washington, D.C. (Brig. Gen. F. E. Wilson, USAR, Executive Director, 1500 Massachusetts Ave., NW, Washington, D.C. 20005)

16-20. **American Assoc. of Blood Banks**, Houston, Tex. (L. J. James, AABB, 30 N. Michigan Ave., Chicago, Ill. 60602)

16-20. **Gulf and Caribbean Fisheries Inst.**, 22nd annual, Miami Beach, Fla. (Executive Secretary, Gulf and Caribbean Fisheries Inst., 10 Rickenbacker Causeway, Miami 33149)

16-20. **American Soc. of Mechanical Engineers**, Los Angeles, Calif. (O. B. Schier, II, United Engineering Center, 345 E. 47 St., New York 10017)

17-19. **National Fire Protection Assoc.**, Denver, Colo. (D. Richardson, The Association, 60 Batterymarch St., Boston, Mass. 02110)

17-21. **Electronic Industries Assoc.**, Laser Subdivision, Paris, France. (J. Davis, EIA Subdivision, 2001 Eye St., NW, Washington, D.C. 20006)

17-21. **World Mental Health Assembly**, Washington, D.C. (P. V. Lemkau, Assembly Chairman, 615 N. Wolfe St., Baltimore, Md. 21205)

18-19. **International Federation of Surgical Colleges**, Buenos Aires, Argentina. (R. S. Johnson-Gilbert, Secretary, c/o Royal College of Surgeons of England, Lincoln's Inn Fields, London, W.C.2, England)

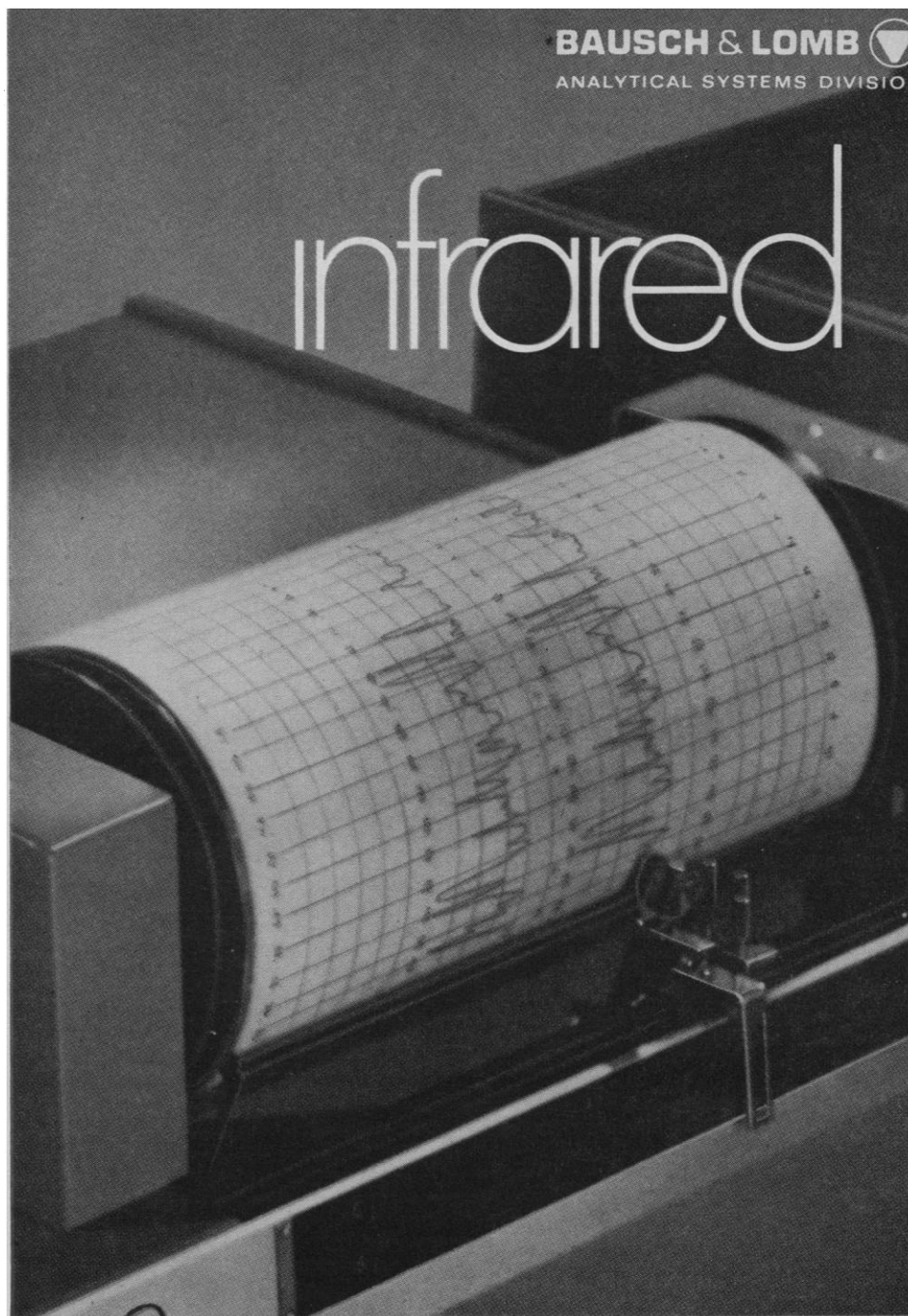
18-21. **Magnetism and Magnetic Materials**, 15th conf., Philadelphia, Pa. (J. Blades, Franklin Inst., Research Labs., Philadelphia 19103)

19-21. **Eastern Analytical Symp.**, New York, N.Y. (R. J. Knauer, Advanced Materials Div., Armco Steel Corp., P.O. Box 1697, Baltimore, Md. 21203)

20-21. **Association for the Study of Animal Behaviour**, London, England. (J. Cullen, Psychology Dept., The University, Stirling, England)

20-23. **American Anthropological Assoc.**, New Orleans, La. (C. C. Reining, Suite 112, 3700 Massachusetts Ave., NW, Washington, D.C. 20016)

20-24. **Audio Engineering Soc.**, 37th

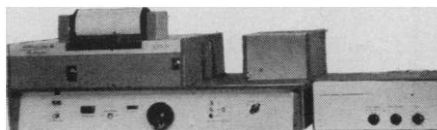


## continuous scanning

... over the entire  $4000-400\text{ cm}^{-1}$  range is just one of the unique features of the Bausch & Lomb/Shimadzu SPECTRONIC 270 IR Infrared Spectrophotometer. An automatic grating-and-filter interchange permits recording absorption spectra *continuously—with no scanning stop*. A vernier gives 10X readability over the paper, there's a 3 slit program for automatic operation, and you can make manual ad-

justments as well. You can get three different size spectra — normal, 2:1 scale expansion on the T axis, and reduced for report writing. There's a 5X wavelength scale expansion and a choice of four scanning speeds—10, 20, 45, and 90 minutes.

Performance is outstanding, too. Exceptionally high resolution— $0.8\text{ cm}^{-1}$  at  $1000\text{ cm}^{-1}$  (manually);  $\pm 0.5\%$  T accuracy; 0.5% T reproducibility; and very low stray light. Care to compare? Write for our Catalog 39-6009, or insist on a demonstration. Analytical Systems Division, Bausch & Lomb, 75921 Bausch Street, Rochester, New York 14602.



Spectronic 270 IR Infrared Spectrophotometer

Circle No. 28 on Readers' Service Card

## Speed separation and dialysis of dilute macro- molecular solutions



Advanced ultrafiltration systems — with DIAFLO® membranes that retain molecules at levels from 500 to 100,000 MW — can save you hundreds of laboratory hours. Produce up to 1000-fold concentrations of dilute protein solutions without denaturation. Partition complex mixtures or dialyze efficiently and fast even at low salt concentration.

Modular units or self-contained systems. Accessories for automated use. Send for Applications Guide!

# amicon

Scientific Systems Div., Dept. C45  
**AMICON CORPORATION**  
21 Hartwell Ave., Lexington, Mass. 02173  
Please send Free Applications Guide.

Name \_\_\_\_\_  
Institution \_\_\_\_\_  
Department \_\_\_\_\_  
Street \_\_\_\_\_  
City \_\_\_\_\_  
State \_\_\_\_\_ Zip Code \_\_\_\_\_

Circle No. 81 on Readers' Service Card

conv., New York, N.Y. (J. D. Colvin, Room 428, 60 E. 42 St., New York 10017)

21-22. **Clinical Conf.**, 13th annual, Houston, Tex. (J. Brandenberger, M. D. Anderson Hospital & Tumor Inst., Univ. of Texas, Houston 77025)

30-3. **American Acad. for Cerebral Palsy**, Las Vegas, Nev. (G. Solomons, University Hospitals, Iowa City, Iowa 52240)

30-4. **American Nuclear Soc.**, San Francisco, Calif. (O. J. Du Temple, ANS, 244 E. Ogden Ave., Hinsdale, Ill. 60521)

### December

1-4. **Entomological Soc. of America**, Chicago, Ill. (R. H. Nelson, 4603 Calvert Rd., College Park, Md. 20740)

2-5. **Reticuloendothelial Soc.**, 6th natl., San Francisco, Calif. (E. Dobson, Donner Lab., Univ. of California, Berkeley 94720)

3-5. **International Wire and Cable Symp.**, Atlantic City, N.J. (J. Spergel, U.S. Army Electronics Command, Amsel-K1-EE, Fort Monmouth, N.J. 07703)

3-6. **American Assoc. of Physicists in Medicine**, Chicago, Ill. (J. G. Kereiakes, Radioisotope Lab., Cincinnati General Hospital, Cincinnati, Ohio 45229)

5-6. **Oklahoma Acad. of Science**, Edmond. (J. T. Self, 730 South Oval, Univ. of Oklahoma, Norman 73069)

5-6. **Interferon Symp.**, New York, N.Y. (I. Saulpaugh, New York Heart Assoc., 2 E. 64 St., New York 10021)

5-6. **American Rheumatism Assoc.**, Tucson, Ariz. (M. M. Walsh, ARA, 1212 Avenue of the Americas, New York 10036)

5-7. **American Acad. of Oral Medicine**, New York, N.Y. (B. Tuchman, 200 Central Park South, New York 10019)

5-7. **American Acad. of Psychoanalysis**, New York, N.Y. (M. Carroll, AAP, 125 E. 65 St., New York 10021)

6-11. **Galaxy Conf. on Adult Education**, Washington, D.C. (E. Sydnor, 900 Silver Spring Ave., Silver Spring, Md. 20910)

7-9. **American Soc. of Hematology**, Cleveland, Ohio. (F. H. Gardner, Presbyterian-Univ. of Pennsylvania Medical Center, Philadelphia 19104)

7-12. **American Soc. for Testing and Materials**, Cincinnati, Ohio. (T. A. Marshall, Jr., ASTM, 1916 Race St., Philadelphia, Pa. 19103)

8-10. **Applications of Simulation**, 3rd conf., Los Angeles, Calif. (P. J. Kiviat, RAND Corp., 1700 Main St., Santa Monica, Calif. 90406)

8-10. **Circuit Theory**, intern. symp., San Francisco, Calif. (B. J. Leon, School of Electrical Engineering, Cornell Univ., Ithaca, N.Y. 14850)

8-10. **National Electronics Conf. and Exhibition**, 25th, Chicago, Ill. (R. J. Napolitan, NEC, Oakbrook Executive Plaza #2, 1211 W. 22 St., Oak Brook, Ill. 60521)

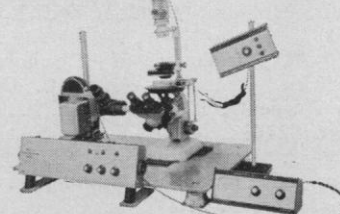
8-10. **Southern Surgical Assoc.**, Hot Springs, Va. (D. C. Sabiston, Jr., Duke Univ. Medical Center, Durham, N.C. 27706)

8-11. **Oak Ridge Associated Universi-**

## SAGE ADDS VERSATILITY TO YOUR MICROSCOPE

### Complete Cinemicrography Systems

Complete systems for taking time lapse and normal speed 16 mm motion pictures through up-right and inverted microscopes. Assure sharp, clear pictures of living materials at high magnifications. Table-top and console models available.



Series 500 Models (shown) — from \$1,810

For information, circle # on reader service card.

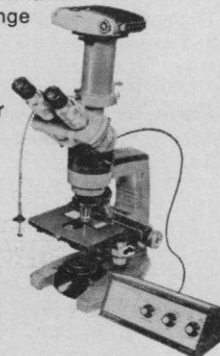
### Photomicrography Exposure Meters

Precalibrated and direct-reading, Sage exposure meters make photomicrography swift, sure, semi-automatic.

Cover film speed range of ASA 20-3000.

All camera backs

may be used. Models available for A-O, B&L Zeiss microscopes and Leitz Aristophot Stand.



Model 297 (shown)

for A-O Series

10 & 20 — Price \$350

For information, circle # on reader service card.

### Air Curtain Incubator

The incubator without an enclosure!

Holds temperature of biological specimens under the microscope to  $\pm 0.3^\circ\text{C}$  anywhere within  $30^\circ$

to  $40^\circ\text{C}$  range. Blows soft stream of warm or ambient air onto a specimen as demanded by a thermistor attached to specimen.



Model 279 (shown) — \$395

For information, circle # on reader service card.

## SAGE INSTRUMENTS, INC.

Subsidiary of Orion Research Incorporated  
230 Ferris Avenue, White Plains, N.Y. 10603  
914 949-4121

Circle No. 82 on Readers' Service Card

ties Symp. in Medicine, 12th, Oak Ridge, Tenn. (R. M. Kniseley, Medical Div., Oak Ridge Associated Universities, Oak Ridge 37830)

11-12. Conference on Holography and the Computer, Houston, Tex. (J. A. Jordan, Jr., IBM, Houston Scientific Center, 6900 Fannin St., Houston 77025)

12-14. American Psychoanalytic Assoc., New York, N.Y. (H. Fischer, 1 E. 57 St., New York 10022)

14-18. American Assoc. of Hospital Pharmacists, Washington, D.C. (J. A. Oddis, AAHP, 4630 Montgomery Ave., Bethesda, Md. 20014)

15-18. American Geophysical Union, San Francisco, Calif. (W. E. Smith, AGU, 2100 Pennsylvania Ave., NW, Washington, D.C. 20037)

17-19. Symposium on Infections and Immunosuppression in Sub-Human Primates, Rijswijk, Netherlands. (H. Balner, Radiobiological Institute TNO, Lange Kleiweg 151, Rijswijk Z.H., Netherlands)

18-20. International Symp. on Computer and Information Science (COINS-69), Miami Beach, Fla. (J. T. Lou, Univ. of Florida, Gainesville 32601)

26-30. Sigma Delta Epsilon, Boston, Mass. (M. Myers, 6234 Mary Lane Dr., San Diego, Calif. 92115)

26-31. American Assoc. for the Advancement of Science, 136th mtg., Boston, Mass. (Meetings Manager, 1515 Massachusetts Ave., NW, Washington, D.C. 20005)

26-31. Animal Behavior Soc., Boston, Mass. (B. Dane, Tufts Univ., Medford, Mass.)

26-31. American Soc. of Naturalists, Boston, Mass. (B. H. Judd, Dept. of Zoology, Univ. of Texas, Austin 78712)

26-31. Society of Protozoologists, Boston, Mass. (M. Hammond, Dept. of Zoology, Utah State Univ., Logan 84321)

26-31. National Assoc. of Science Writers, Boston, Mass. (R. Arctander, The Association, Box H, Sea Cliff, N.Y. 11579)

26-31. Scientific Research Soc. of America, Boston, Mass. (C. A. Walker, SRSA, 155 Whitney Ave., New Haven, Conn. 06510)

26-31. Sigma Pi Sigma, Boston, Mass. (C. G. Shugart, Society of Physics Students, State Univ. of New York, Stony Brook 11790)

26-31. Society for the Study of Evolution, Boston, Mass. (D. L. Jameson, Dept. of Biology, Univ. of Houston, Houston, Tex. 77004)

26-31. American Soc. of Zoologists, Boston, Mass. (J. R. Shaver, Dept. of Zoology, Michigan State Univ., East Lansing 48823)

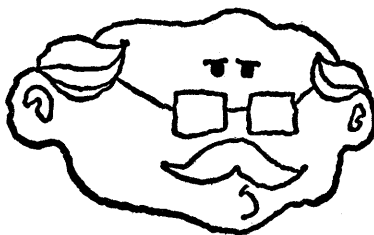
27-30. Archaeological Inst. of America, San Francisco, Calif. (J. S. Ord, AIA, 260 West Broadway, New York 10013)

27-30. Western Soc. of Naturalists, Los Angeles, Calif. (D. H. Montgomery, Dept. of Biological Sciences, California State College, San Luis Obispo 94301)

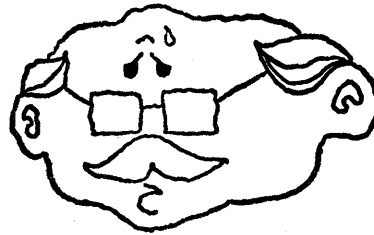
28-30. American Historical Assoc., Washington, D.C. (W. D. Harris, AHA, 400 A Street, SE, Washington, D.C. 20003)

29-31. American Physical Soc., Los Angeles, Calif. (W. W. Havens, Jr., APS, 335 E. 45 St., New York 10017)

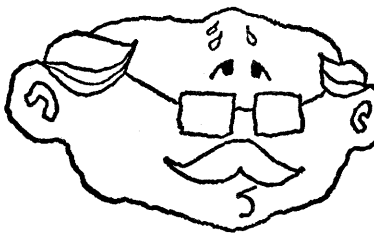
**NO SIR.  
THERE'S NOTHING  
SIMPLE ABOUT RUNNING  
THIS LAB.**



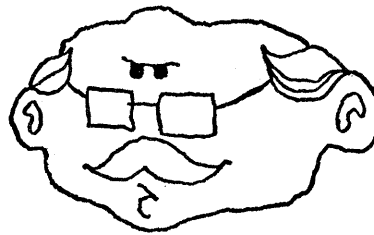
**IT'S  
DECISIONS,  
DECISIONS,  
DECISIONS.**



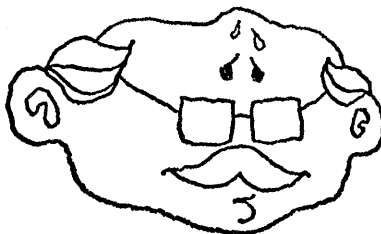
**WHAT TESTS  
TO RUN WHEN.  
WHO GETS  
PAY RAISES.**



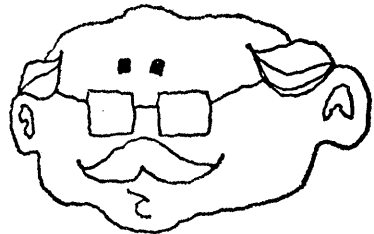
**SOMETIMES  
EVEN HAVE TO  
ARBITRATE  
COFFEE BREAKS.**



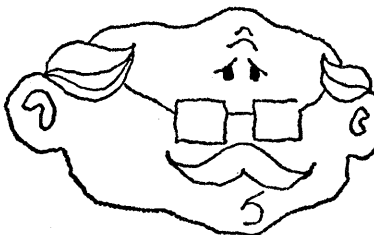
**AND THE  
PURCHASING DECISIONS!  
WHAT'S GOOD?  
WHAT'S BAD?**



**BUT GLASSWARE IS EASY.  
PYREX. ONLY CORNING  
MAKES PYREX LABWARE.  
NO DECISION THERE.**



**DO YOU  
KNOW MY SON,  
THE PYREX®  
SALESMAN?**



No matter whether you know the salesman or not, you can know that every PYREX brand flask, beaker, bottle, dish, condenser, pipet, buret, cylinder is made by Corning. That's comforting, isn't it? Available in quality and quantity from your Corning dealer.

**CORNING**  
LABORATORY PRODUCTS

Makers of PYREX® Labware





**TO  
-140°F  
(-96°C)**

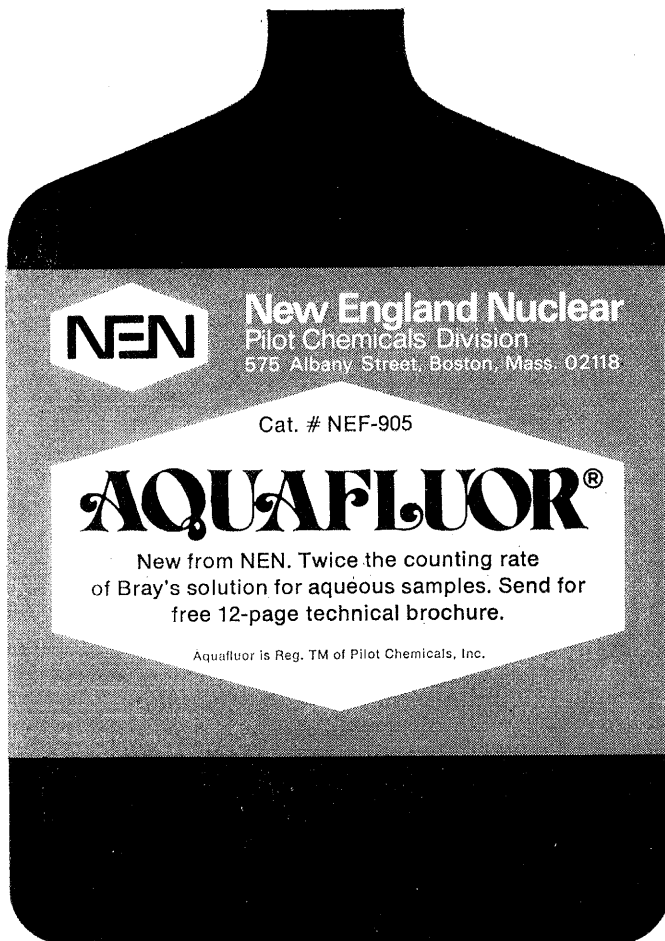
**REVCO ULTRA-LOW TEMPERATURE CABINETS**  
FOR RESEARCH, STORAGE, SEASONING, TESTING

REVCO ULT cabinets are in use in all leading medical schools and universities, research centers and industrial complexes. Precision accuracy control. Low amperage draw. Chest models from 1½ cu. ft. to 24 cu. ft. — Uprights 10 cu. ft. Compact 24" refrigerators and freezers also available. Let us recommend specific ULT equipment for you. Write for FREE Fact File to:

**REVCO, INC.**  
Scientific & Industrial Division  
1100 Memorial Dr.  
West Columbia, South Carolina 29169

**REVCO**  
LEADER IN ULTRA-LOW TEMPERATURE SINCE 1938

Circle No. 102 on Readers' Service Card



**NEN** New England Nuclear  
Pilot Chemicals Division  
575 Albany Street, Boston, Mass. 02118

Cat. # NEF-905

**AQUAFLUOR®**

New from NEN. Twice the counting rate of Bray's solution for aqueous samples. Send for free 12-page technical brochure.

Aquafluor is Reg. TM of Pilot Chemicals, Inc.

Circle No. 105 on Readers' Service Card

## ACID DIGESTION BOMB

New from

**PARR**

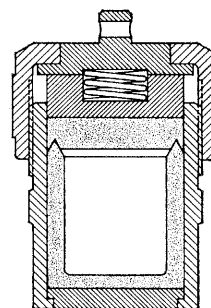
Provides a rapid and safe method for dissolving glass, silicates, nitrides, rocks and other refractory materials in HF, HCl and other strong mineral acids at temperatures to 150° C. and pressures to 1200 psig. Acids do not attack this bomb and complete recovery is assured, including any trace elements.



The acid charge is held in a 25 ml. thick walled Teflon\* cup within a sturdy metal bomb. The cup can be removed for convenient sample recovery and easy washing. No wrenches or clamps are needed to produce a tight seal.

\*duPont TFE fluorocarbon resin

Write for Data Sheet 4745



Cross-Section Diagram

## PARR INSTRUMENT COMPANY

211 Fifty-Third St.

Moline, Illinois 61265

Circle No. 104 on Readers' Service Card



**LO-TEMP BATH**  
**HEATS,**  
**COOLS**  
**\$462.**

Double the range of the average visibility bath! Waco's Lo-Temp Bath maintains temperature at any level from -10°C to +65°C, ±.01°C . . . ideal where precise temperature control is required. Plenty of testing room, too. Coils fit snugly against the bottom. Use the entire volume of the jar. Self-contained unit is only 20½" wide, 27½" high.

No. 882 Waco Lo-Temp Refrigerated Bath, complete with Pyrex jar 12" diam., for 115V, 50/60 cycle AC. **\$462.**

Write for WACO Bath Bulletin for complete information

Laboratory Supplies and Equipment.

**wilkens-anderson co.**

4525 W. Division St., Chicago, Ill. 60651

Circle No. 106 on Readers' Service Card

## BOOKS RECEIVED

(Continued from page 1003)

**Animal Bones in Archaeology.** A Book of Notes and Drawings for Beginners. Michael L. Ryder. Published for the Mammal Society by Blackwell Scientific Publications, Oxford, ed. 2, 1969 (U.S. distributor, Davis, Philadelphia). xxiv + 68 pp. Paper, \$3.

**Animal Discrimination Learning.** Based on a conference, Sussex, England, 1967. R. M. Gilbert and N. S. Sutherland, Eds. Academic Press, New York, 1969. xvi + 502 pp., illus. \$19.50.

**Animal Diversity.** Milton Fingerman. Holt, Rinehart and Winston, New York, 1969. viii + 184 pp., illus. Paper, \$2.95. Modern Biology Series.

**Annual Review of Medicine.** Vol. 20. Arthur C. DeGraff and William P. Creger, Eds. Annual Reviews, Palo Alto, Calif., 1969. x + 500 pp., illus. \$8.50.

**Annual Review of Pharmacology.** Vol. 9. Henry W. Elliott, Windsor C. Cutting, and Robert H. Dreisbach, Eds. Annual Reviews, Palo Alto, Calif., 1969. viii + 594 pp., illus. \$8.50.

**The Apologie and Treatise of Ambroise Paré.** Containing the Voyages Made into Divers Places with Many of His Writings upon Surgery. Geoffrey Keynes, Ed. Dover, New York, 1968. xxiv + 244 pp., illus. Paper, \$2.50. Reprint of the 1952 edition.

**Astrophysics and Stellar Astronomy.** Thomas L. Swihart. Wiley, New York, 1969. x + 310 pp., illus. \$9.95. Space Science Text Series.

**Atherosclerosis.** Pathology, Physiology, Aetiology, Diagnosis and Clinical Management. F. G. Schettler and G. S. Boyd, Eds. Elsevier, New York, 1969. xx + 1032 pp., illus. \$69.50.

**Atom, Man, and the Universe.** The Long Chain of Complications. Hannes Alfvén. Translated from the Swedish edition (Stockholm, 1964) by John M. Hoberman. Freeman, San Francisco, 1969. viii + 112 pp. \$3.50.

**Attitude Change.** A Critical Analysis of Theoretical Approaches. Charles A. Kiesler, Barry E. Collins, and Norman Miller. Wiley, New York, 1969. xiv + 386 pp. \$8.95. Series in Psychology.

**Bacterial Metabolism.** H. W. Doelle. Academic Press, New York, 1969. xiv + 490 pp., illus. \$14.50.

**Bacterial Physiology and Metabolism.** J. R. Sokatch. Academic Press, New York, 1969. xii + 444 pp., illus. \$14.50.

**Basic Microbiology.** Margaret F. Wheeler and Wesley A. Volk. Lippincott, Philadelphia, ed. 2, 1969. xii + 412 pp., illus. \$8.75.

**Basic Physiology and Anatomy.** Ellen E. Chaffee and Esther M. Greisheimer. Lippincott, Philadelphia, ed. 2, 1969. xii + 634 pp., illus. \$9.40.

**Beeinflussung des Stoffwechsels durch die Ernährung.** A symposium, Bad Soden, 1967. J. C. Somogyi and H. D. Cremer, Eds. Karger, Basel, 1969 (U.S. distributor, Phiebig, White Plains, N.Y.). vi + 170 pp., illus. Paper, \$14.40. Bibliotheca "Nutritio et Dieta," No. 11. Institute of Nutrition Research of the Green Meadow Foundation, vol. 11.

**Bibliographic Control of the Literature**

**of Oncology 1800-1960.** Pauline M. Vailancourt. Scarecrow Press, Metuchen, N.J., 1969. 232 pp. \$5.

**The Biochemistry of the Nucleic Acids.** J. N. Davidson. Methuen, London, ed. 6, 1969 (U.S. distributor, Barnes and Noble, New York). xvi + 352 pp., illus. \$8.

**Biology of Peromyscus (Rodentia).** John A. King, Ed. American Society of Mammalogists, Stillwater, Okla., 1968 (available from Bryan P. Glass, Department of Zoology, Oklahoma State University, Stillwater). xiv + 594 pp., illus. \$15. Special Publication No. 2.

**Biology of Termites.** Vol. 1. Kumar Krishna and Frances M. Weesner, Eds. Academic Press, New York, 1969. xiv + 600 pp., illus. \$32.

**Biophysique.** I. Energétique Cinétique: Isotopes. Jacques Tonnelat. Masson, Paris, 1968. viii + 404 pp., illus. 80 F. Certificat de Biochimie Structurale et Métabolique.

**Black's Medical Dictionary.** William A. R. Thomson. Barnes and Noble, New York, ed. 28, 1969. xii + 1016 pp. + plates. \$7.

**Carbohydrate Metabolism and Its Disorders.** F. Dickens, P. J. Randle, and W. J. Whelan, Eds. Academic Press, New York, 1968. Vol. 1 (xvi + 578 pp., illus. \$20); vol. 2 (xiv + 394 pp., illus. \$16).

**The Cell Cycle.** Gene-Enzyme Interactions. G. M. Padilla, G. L. Whitson, and I. L. Cameron, Eds. Academic Press, New York, 1969. xx + 404 pp., illus. \$19.50. Cell Biology Series.

**Cellular Immunology.** Books 1 and 2. Macfarlane Burnet. Melbourne University Press, Carlton, Victoria, Australia; Cambridge University Press, New York, 1969. x + 728 pp., illus. + 8 plates. \$18.50.

**Chemistry.** Structure and Changes of Matter. Uno Kask. Barnes and Noble, New York, 1969. xvi + 608 pp., illus. Paper, \$5.95. Barnes and Noble International Textbook Series.

**Coasts.** E. C. F. Bird. M.I.T. Press, Cambridge, Mass., 1969. xvi + 246 pp., illus. \$7.50. An Introduction to Systematic Geomorphology, vol. 4.

**Communication Satellites.** Ingemar Dörfer, Almqvist and Wiksell, Stockholm, 1969. 56 pp. Paper. Stockholm International Peace Research Institute: Stockholm Papers, No. 1.

**Complementarity in Biology.** Quantization of Molecular Motion. James P. Isaacs and John C. Lamb. Johns Hopkins Press, Baltimore, 1969. x + 184 pp., illus. \$6.50.

**Condensed Computer Encyclopedia.** Philip B. Jordain. Michael Breslau, Ed. McGraw-Hill, New York, 1969. xvi + 608 pp., illus. \$14.50.

**The Corrosion and Oxidation of Metals: First Supplementary Volume.** Ulick R. Evans. St. Martin's, New York, 1968. viii + 488 pp., illus. \$20.

**Cours de Théorie Relativiste Unitaire.** Jean E. Charon. Michel, Paris, 1969. 230 pp., illus. 58.10 F. Progrès des Sciences et Techniques.

**Creative Biology Teaching.** Delma E. Harding, Roger P. Volker, and David L. Fagle. Iowa State University Press, Ames, 1969. viii + 344 pp., illus. \$10.50.

**Currents in American Medicine.** A Developmental View of Medical Care and Education. Julius B. Richmond. Harvard University Press, Cambridge, Mass., 1969.



WORTHINGTON

For 1969-70...

## New Worthington catalog lists enzymes for research

Our newly published catalog lists more than 230 high purity enzymes and related biochemicals for research. Several are produced through the use of such advanced techniques as column chromatography, disc gel and free-flow electrophoresis.

The catalog provides essential information on enzyme source, activity, purity, assay, packaging, and price for each biochemical. Also listed is a group of enzymatic reagents for clinical diagnosis.

At Worthington we insist on preparing all our own enzyme products, carrying them from raw material through processing, purification, and packaging. With complete control over each step, we can give important guarantees of enzyme quality. Other suppliers—re-sale houses offering something made by somebody else—can't do it.

Use the attached coupon to request your copy of Worthington Enzymes for Research or other Worthington literature.

Canadian distributor: Winley-Morris Co., Ltd., Montreal.



Worthington Biochemical Corporation  
Freehold, New Jersey 07728

Please send the following:

- ☐ Worthington Enzymes for Research
- ☐ Worthington Enzyme Reagents for Clinical Diagnosis
- ☐ I am a new customer. Send the complete Worthington Enzyme Manual.

Name \_\_\_\_\_

Title \_\_\_\_\_

Organization \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_

Zip \_\_\_\_\_

## What in the world ARE YOU doing with a Brinkmann Micromanipulator?

First and foremost, Brinkmann micromanipulators were designed for biological applications, so it's no surprise they are widely used in microsurgery and neurophysiology.

What is surprising is that they have so many other uses. For example, in microchemistry, they're used to handle radioactive samples; in electronics, to probe microcircuits, and by physicists to align laser systems.

What could you be doing more efficiently with a Brinkmann micromanipulator? Over 40 different models permit precise movement in magnification ranges up to 750X. There are inverted models, models with calibrated high sensitivity drives, tilting and rotating devices, and a full range of accessories. Let our free catalog start you thinking of some novel new uses. Just write: Brinkmann Instruments, Cantiague Rd., Westbury, New York 11590.



Circle No. 80 on Readers' Service Card

## NOW...uniformly coat TLC plates regardless of plate thickness

Read how both models of Shandon Unoplan® Levellers coat even layers with certainty on every TLC plate. Or better, send for complete catalog on Thin Layer Chromatography and Thin Layer Electrophoresis to Shandon Scientific Company, Inc., 515 Broad Street, Sewickley, Pa. 15143 (Pittsburgh District).



**Unoplan Model P** brings plates into plane against guide rail lips by a few pumps of rubber bulb. After coating, air pressure is released and plates slide out end with thin, uncoated margin on each side for handling ease. \$150.

**Unoplan Semi-Automatic Model SA** has platform covered with aluminum sheet, and plates rest on two rubber strips. Swinging the lever closes hinged side and raises platform against lips of guide rails. Reversing the lever drops down hinged side allowing plates to be lifted out easily without damaging layers. \$230.

**TLC Adjustable Spreader** fits guide rails of either model. \$48.

# SHANDON

PITTSBURGH • LONDON • FRANKFURT

Circle No. 84 on Readers' Service Card

xviii + 142 pp., illus. \$5.50. A Commonwealth Fund Book.

**Cybernetic Serendipity.** The Computer and the Arts. An exhibition, London, 1968. Jasja Reichardt, Ed. Praeger, New York, 1969. 104 pp., illus. \$8.95. Studio International Special Issue.

**Decision Making and Administration in Higher Education.** John D. Millett. Kent State University Press, Kent, Ohio, 1968. x + 162 pp. Cloth, \$5; paper, \$1.95.

**Deformation of Solids.** I. H. Hall. Barnes and Noble, New York, 1968. x + 230 pp., illus. \$7.95.

**Delinquents and Nondelinquents in Perspective.** Sheldon and Eleanor Glueck. Harvard University Press, Cambridge, Mass., 1968. xx + 268 pp. \$8.50.

**The Design of Optical Spectrometers.** J. F. James and R. S. Sternberg. Chapman and Hall, London, 1969. (U.S. distributor, Barnes and Noble, New York). xii + 240 pp., illus. \$10.50.

**The Development and Use of Polyester Products.** E. N. Doyle. McGraw-Hill, New York, 1969. xii + 372 pp., illus. \$16.

**Dictionary of Nutrition and Food Technology.** Arnold E. Bender. Archon, Hamden, Conn.; Butterworths, London, ed. 3, 1968. viii + 228 pp. \$9.50.

**Differential and Integral Inequalities. Theory and Applications.** Vol. 1, Ordinary Differential Equations. V. Lakshmikantham and S. Leela. Academic Press, New York, 1969. xii + 396 pp. \$18.50. Mathematics in Science and Engineering, vol. 55.

**A Discrete-Time Approach for System Analysis.** Michel Cuénod and Allen Durling. Academic Press, New York, 1969. xii + 226 pp., illus. \$13.50. Electrical Science Series.

**Earth Materials.** W. G. Ernst. Prentice-Hall, Englewood Cliffs, N.J., 1969. x + 150 pp., illus. Cloth, \$5.95; paper, \$2.50. Foundations of Earth Science Series.

**Eastern Europe.** Norman J. G. Pounds. Aldine, Chicago, 1969. xx + 912 pp., illus. + 20 plates. \$12.75. Geographies for Advanced Study.

**Eclosion and Synthesis. Perspectives on the History of Knowledge.** Salomon Bochner. Benjamin, New York, 1969. xiv + 274 pp. Cloth, \$10; paper, \$3.95.

**Electrophoresis.** Duncan J. Shaw. Academic Press, New York, 1969. viii + 144 pp., illus. \$4.95.

**Elementary Differential Equations and Boundary Value Problems.** William E. Boyce and Richard C. DiPrima. Wiley, New York, ed. 2, 1969. xvi + 592 pp., illus. \$10.95.

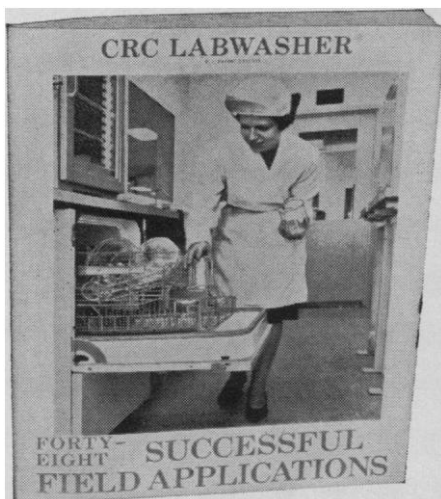
**Eléments de Génétique Rationnelle.** J. de Laguarigue. Dunod, Paris, 1969. x + 134 pp., illus. Paper, 28,00 F. Les bases scientifiques de l'agriculture et leurs conséquences immédiates.

**Elements of Stereochemistry.** Ernest L. Eliel, with a section by F. Basolo. Wiley, New York, 1969. vi + 98 pp., illus. Paper, \$2.95.

**Elsevier's Dictionary of Chemical Engineering.** In English, American, French, Spanish, Italian, Dutch, and German. Compiled and arranged on an English alphabetical basis by W. E. Clason. Elsevier, New York, 1968. Vol. 1, Chemical Engineering and Laboratory Equipment (x + 620 pp. \$25); vol. 2, Chemical En-



# FREE



## PROFITABLE READING...

Forty-eight different laboratories report "in-use" experience with automatic glassware washing and drying systems. This invaluable compilation presents application data in compact outline format and is available *free of charge* to all laboratory personnel.

Type of laboratory, location, number of personnel served, average number of pieces washed daily, operating procedure, and general comment, are given in these application reports.

This information passes along time-saving and money-saving ideas that can solve all kinds of laboratory glassware cleaning problems. A handy index lists usage reports alphabetically, by both type of laboratory and name of user. A special report describes successful results of the Veterans Administration's official 90-day evaluation test and lists some of the many U.S. Governmental Agencies using CRC Labwashers.

You will profit by reading this valuable new report. Send for this free booklet. We'll include full descriptive literature on our Labwasher models.

A-99



THE CHEMICAL RUBBER CO.

18901 Cranwood Parkway  
Cleveland, Ohio

Visit our booths 449, 450, 451, 452  
at the Pittsburgh Convention

Circle No. 86 on Readers' Service Card

gineering; Processes and Products (x + 572 pp. \$25).

**Entomological Parasitology.** The Relations between Entomology and the Medical Sciences. Marcel Leclercq. Translated by G. Lapage. Pergamon, New York, 1969. xviii + 160 pp., illus. \$8. International Series of Monographs in Pure and Applied Biology: Modern Trends in Physiological Sciences, vol. 29.

**Environment and Cultural Behavior.** Ecological Studies in Cultural Anthropology. Andrew P. Vayda, Ed. Published for the American Museum of Natural History by Natural History Press, Garden City, N.Y., 1969. xviii + 486 pp., illus. Cloth, \$7.95; paper, \$2.95. American Museum Sourcebooks in Anthropology.

**The Excavations at Helwan.** Art and Civilization in the First and Second Egyptian Dynasties. Zaki Y. Saad. J. Frank Autry, Ed. University of Oklahoma Press, Norman, 1969. xvi + 208 pp., illus. \$6.95.

**Expanding Dimensions in Rehabilitation.** A Reference for the Health Professional. Based upon presentations made at the Institute in Advanced Techniques for Occupational Therapists, Cleveland, 1966. Lelia Jaffe Zamir, Ed. Thomas, Springfield, Ill., 1969. xiv + 202 pp., illus. \$12.

**Experimental Cell Biology.** An Elementary Laboratory Guide. William R. Bowen. Macmillan, New York; Collier-Macmillan, London, 1969. viii + 264 pp., illus. Paper, \$4.95.

**Experiments in Microbial Genetics.** A practical course, Hammersmith Hospital, London, 1960-64. R. C. Clowes and W. Hayes, Eds. Wiley, New York, 1968. xii + 244 pp., illus. Spiral bound, \$5.95.

**Explanation and Human Action.** A. R. Louch. University of California Press, Berkeley, 1969. x + 244 pp. Paper, \$2.65. Reprint of the 1967 edition.

**Exploitable Molecular Mechanisms and Neoplasia.** Twenty-second Annual Symposium on Fundamental Cancer Research, Houston, Texas, 1968. Published for the University of Texas M. D. Anderson Hospital and Tumor Institute by Williams and Wilkins, Baltimore, 1969. xiv + 626 pp., illus. \$17.

**Exploring Light.** Alexander Efron. Hayden, New York, 1969. viii + 140 pp., illus. Paper, \$3.95. Hayden Modern Physics Series.

**Exploring Mechanics.** Alexander Efron. Hayden, New York, 1969. x + 182 pp., illus. Paper, \$4.95. Hayden Modern Physics Series.

**Faces.** Roy U. Jordan. Illustrated by Brenda Jordan. Published by the author, Box 136, Emporia, Kansas, 1969. viii + 150 pp. Paper, \$1.95.

**Farbfernseh-Servicetechnik.** F. Möhring. Winter'sche Verlagshandlung, Braunschweig, 1969. viii + 248 pp., illus. DM 36.

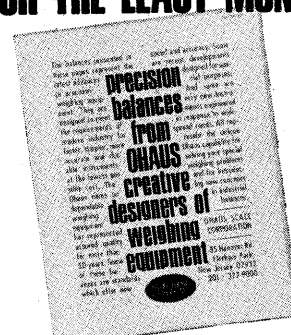
**Fertility and Family Planning.** A World View. A conference, Ann Arbor, Mich., 1967. S. J. Behrman, Leslie Corsa, Jr., and Ronald Freedman, Eds. University of Michigan Press, Ann Arbor, 1969. viii + 504 pp., illus. \$12.50. A Sesquicentennial Publication.

**Fluorescent Antibody Techniques and Their Applications.** Akiyoshi Kawamura, Jr., Ed. University of Tokyo Press, Tokyo; University Park Press, Baltimore, 1969. xiv + 204 pp., illus. \$16.50.

# NEW...NEW

## Compendium of Innovations and Developments in Weighing Instrumentation and Systems

for the  
**INDUSTRIAL LAB and  
PRODUCTION FACILITY**  
Concerned with  
**S-T-R-E-T-C-H-I-N-G**  
the Budget Dollar  
and getting  
**THE MOST INSTRUMENT  
FOR THE LEAST MONEY**



**8-PAGES-8**  
of VALUABLE INFORMATION  
in BULLETIN 0-17...  
get your **FREE** copy Now!



**OHAUS SCALE CORPORATION**  
29 Hanover Road  
Florham Park, New Jersey 07932

Circle No. 78 on Readers' Service Card



# ATOMIC DATA

A Journal Devoted to Compilations of Experimental and Theoretical Results in Atomic Physics

Edited by **KATHARINE WAY**, *Department of Physics, Duke University, Durham, North Carolina*

Atomic Data will publish tables and compilations of experimental and theoretical data in various areas of atomic physics. Collections and evaluations of data on energy levels, wave functions, collision processes, various interaction cross sections of atoms and simple molecules, transition probabilities, penetration through matter of charged particles, etc. are invited. The reissue of important old tables which have become generally unavailable will also be considered. Critical tables will be accepted, preferably accompanied by the data on which they are based.

*Volume 1, No. 1: September, 1969 (to be published quarterly)*

*Institutional Price: \$20.00 per vol. (Postage outside the U.S. and Canada, \$3.00 per vol.)*

## RADIATION AND PROPAGATION OF ELECTROMAGNETIC WAVES

By **GEORGE TYRAS**, *Professor of Electrical Engineering, Cullen College of Engineering, University of Houston, Houston, Texas*

A volume of **ELECTRICAL SCIENCE** a Series of Monographs and Texts

edited by **HENRY G. BOOKER** and **NICHOLAS DE CLARIS**

*September 1969, about 375 pp.*

## THEORY OF QUANTUM FLUIDS

By **EUGENE FEENBERG**, *Department of Physics, Washington University, St. Louis, Missouri*

A volume of **PURE AND APPLIED PHYSICS** a Series of Monographs and Textbooks

*October 1969, about 204 pp.*

## ELECTRON PROBE MICROANALYSIS

Edited by **A. J. TOUSIMIS** and **L. MARTON**

Supplement 5 to **ADVANCES IN ELECTRONICS AND ELECTRON PHYSICS**

edited by **L. MARTON**

*October 1969, about 418 pp.*



Circle No. 87 on Readers' Service Card

1044

**Free Vibrations of Circular Cylindrical Shells.** Anthony E. Armenakos, Denos C. Gazis, and George Herrmann. Pergamon, New York, 1969. xii + 212 pp., illus. \$14.

**FROST A Two-Dimensional Few Group Neutron Diffusion Code.** K. Andrzejewski. Institutt for Atomenergi, Kjeller Research Establishment, Kjeller, Norway, 1969. iv + 28 pp., illus. Paper. Kjeller Report No. 133.

**Functions and Graphs.** I. M. Gelfand, E. G. Glagoleva, and E. E. Shnol. Translated and adapted from the second Russian edition by Thomas Walsh and Randell Magee. M.I.T. Press, Cambridge, 1969. vi + 106 pp., illus. Cloth, \$6; paper, \$1.95. Library of School Mathematics, vol. 2.

**Future Goals of Engineering in Biology and Medicine.** Proceedings of an International Conference, Washington, D.C., 1967. James F. Dickson, III, and J. H. U. Brown, Eds. Academic Press, New York, 1969. xvi + 360 pp., illus. \$16.

**Game Theory in the Behavioral Sciences.** A conference, Montreal, 1966. Ira R. Buchler and Hugo G. Nutini, Eds. University of Pittsburgh Press, Pittsburgh, 1969. xvi + 268 pp., illus. \$8.95.

**A General Theory of the Kinematics and Geometry of Gears in Three Dimensions.** A. Dyson. Oxford University Press, New York, 1969. x + 142 pp., illus. \$8.80.

**Hal-Farrug.** A Village in Malta. Jeremy Boissevain. Holt, Rinehart and Winston, New York, 1969. xviii + 108 pp., illus. Paper, \$1.95. Case Studies in Cultural Anthropology.

**Handbook of Applied Hydraulics.** Calvin Victor Davis and Kenneth E. Sorensen, Eds. McGraw-Hill, New York, ed. 3, 1969. xii + 1584 pp., illus. \$37.50.

**Handbook of Middle American Indians.** Vol. 7, Ethnology, Part 1 (viii + 576 pp., illus. + 4 charts. \$15). Vol. 8, Ethnology, Part 2 (viii + pp. 577-968, illus. + 3 maps. \$15). Evon Z. Vogt, Ed. University of Texas Press, Austin, 1969.

**A Handbook of MMPI Group Profiles.** Richard I. Lanyon. University of Minnesota Press, Minneapolis, 1968. xiv + 82 pp., illus. \$7.50.

**Herschel at the Cape.** Diaries and Correspondence of Sir John Herschel, 1834-1838. Edited with an introduction by David S. Evans, Terence J. Deeming, Betty Hall Evans, and Stephen Goldfarb. University of Texas Press, Austin, 1969. xxxviii + 398 pp., illus. + 12 plates. \$10. History of Science Series, No. 1.

**High-Speed Photography.** Proceedings of the Eighth International Congress, Stockholm, 1968. N. Robert Nilsson and Lars Hogberg, Eds. Almqvist and Wiksell, Stockholm; Wiley, New York, 1969. xii + 504 pp., illus. \$31.

**The Higher Learning, the Universities, and the Public.** Carl Kaysen. Princeton University Press, Princeton, N.J., 1969. viii + 88 pp. Cloth, \$4.75; paper, \$1.95. Stafford Little Lectures at Princeton University, 1968.

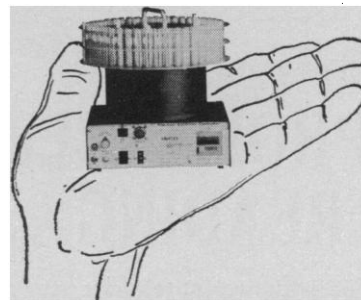
**The History of the Abacus.** J. M. Pullan. Praeger, New York, 1969. xiv + 130 pp., illus. \$4.95.

**History Under the Sea.** A Handbook for Underwater Exploration. Mendel Peterson. Smithsonian Institution Press,

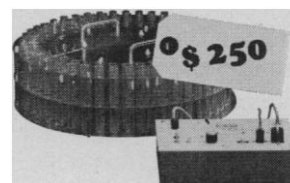
## Looking for a fraction collector?



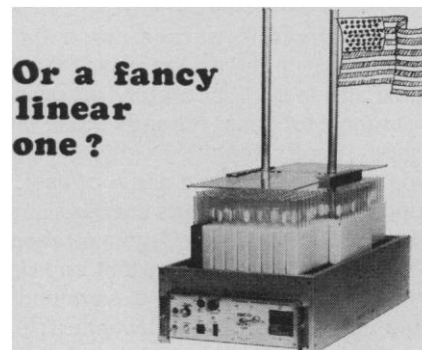
**How about the most compact one made?**



**The least expensive?**



**Or a fancy linear one?**



**ISCO has all kinds.**

**Write for our 1969 catalog.**



**INSTRUMENTATION SPECIALTIES CO., INC.**  
4700 SUPERIOR LINCOLN, NEBRASKA 68504  
PHONE (402) 434-0231 CABLE ISCOLAB LINCOLN

Circle No. 77 on Readers' Service Card

SCIENCE, VOL. 165

Washington, D.C., 1969 (distributor, Random House, New York). xvi + 208 pp., illus. \$5.95. Smithsonian Publication 4538. Reprint of the 1965 edition.

**Hormones, Cells and Organisms.** The Role of Hormones in Mammals. P. Catherine Clegg and Arthur G. Clegg. Stanford University Press, Stanford, Calif., 1969. viii + 216 pp., illus. + 4 plates. Cloth, \$5.50; paper, \$1.95.

**How to Solve General Chemistry Problems.** C. H. Sorum. Prentice-Hall, Englewood Cliffs, N.J., ed. 4, 1969. x + 326 pp. Paper, \$3.95.

**Human Action.** Conceptual and Empirical Issues. A conference, Chicago, 1967. Theodore Mischel, Ed. Academic Press, New York, 1969. xiv + 298 pp., illus. \$6.95.

**Human Growth.** The Story of How Life Begins and Goes On. Lester F. Beck. Harcourt, Brace and World, New York, 1969. viii + 120 pp., illus. \$4.95. Revised version of the 1949 edition.

**Humangenetik.** Ein kurzes Handbuch in fünf Bänden. Band I/2. Peter Emil Becker, Ed. Thieme, Stuttgart, 1969 (U.S. distributor, Intercontinental Medical Books, New York). xvi + 572 pp., illus. DM 224.

**Hypersensitivity Diseases of the Lungs Due to Fungi and Organic Dusts.** J. Pepys. Karger, Basel, 1969 (U.S. distributor, Phiebig, White Plains, N.Y.). viii + 148 pp., illus. \$9.35. Monographs in Allergy, vol. 4.

**I Told You So!** A life of H. G. Wells. James Playsted Wood. Pantheon, New York, 1969. vi + 186 pp., illus. \$3.95.

**I. V. Kurchatov.** A Socialist-Realist Biography of the Soviet Nuclear Scientist. I. N. Golovin. Translated from the Russian edition by William H. Dougherty. Selbstverlag Press, P.O. Drawer 606, Bloomington, Ind., 1969. viii + 102 pp., illus. Paper, \$4.

**Immunization against Infectious Diseases.** D. G. Evans, Ed. Medical Department, British Council, London, 1969. Illus. Paper, \$6.50. British Medical Bulletin, vol. 25, No. 2, pp. 119-218.

**Index of Plants of Texas With Reputed Medicinal and Poisonous Properties.** Henry M. Burlage. University of Texas, Austin, 1968 (available from the author, 702 E. 43 St., Austin). viii + 274 pp. Paper, \$7.

**L'Infraouge Lointain.** Armand Hadni. Presses Universitaires de France, Paris, 1969. 260 pp., illus. Paper, Collection SUP: Le Physicien, No. 2.

**Inorganic Sulphur Chemistry.** G. Nickless, Ed. Elsevier, New York, 1968. xii + 770 pp., illus. \$52.50.

**Interdisciplinary Relationships in the Social Sciences.** A symposium, University Park, Pa., 1967. Muzafer Sherif and Carolyn W. Sherif, Eds. Aldine, Chicago, 1969. xvi + 360 pp., illus. \$9.75.

**An Introduction to Field Quantization.** Y. Takahashi. Pergamon, New York, 1969. xii + 300 pp. \$10. International Series of Monographs in Natural Philosophy, vol. 20.

**An Introduction to the Practical Study of Crystals, Minerals, and Rocks.** K. G. Cox, N. B. Price, and B. Harte. McGraw-Hill, New York, 1969. viii + 236 pp., illus. \$8.75.

**Isocyanide Complexes of Metals.** L.



## BETA-FUGE™ SAYS "YES" TO EVERYTHING YOU EXPECT

CAPACITIES TO 4,000 ml ☆ FORCES TO 41,300 x G  
SPEED. CAPACITY. VOLUME. FORCE. AUTOMATION. CONVENIENCE.  
For Batch and Continuous Flow procedures from -20°C to +40°C,  
the Lourdes Beta-Fuge Model A-2 offers unparalleled work/economy  
potential. Seventeen meticulously engineered features make the A-2  
your finest centrifuge investment . . . by far. **Full factory services.**  
For more details, see Guide to Scientific Instruments. For full infor-  
mation, ask your dealer or write.

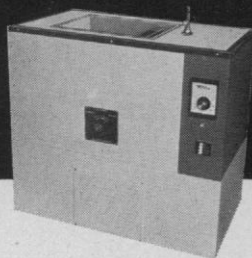
**LOURDES INSTRUMENT CORPORATION**  
OLD BETHPAGE, L. I., NEW YORK 11804 516-694-8686



Circle No. 32 on Readers' Service Card



## Look at all three! (There's one for you)



MR-9  
(-73.3° C to +120° C)

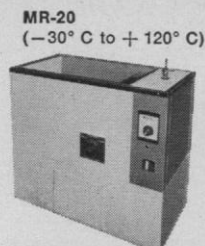
### Each of the Relialab Lami-Flow Units shown is...

... a temperature bath for use in biological and biochemical applications (low and high range from -73.3° C to +120° C with  $\pm 0.03^\circ$  C temperature control stability).

... a circulator providing constant temperature coolant to spectrophotometers, refractometers, etc.

... an incubator with the addition of optional air heater and fan for precision incubation temperatures.

And they each offer solid state SCR output and an "automatic reset" proportional controller.



MR-20  
(-30° C to +120° C)



MR-7 Bench Top  
(-30° C to +120° C)



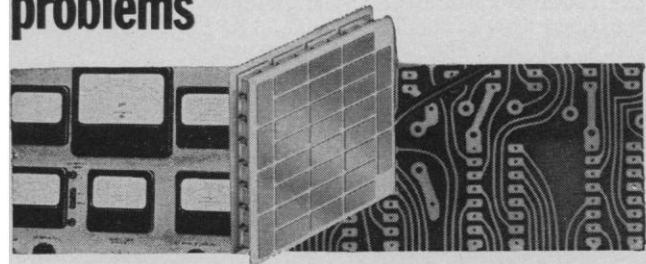
# Relialab

by **Tenney**  
ENGINEERING, INC.

1090 Springfield Rd., Union, N. J. 07083 • (201) 686-7870

Circle No. 107 on Readers' Service Card

## Ceramic thermoelectrics for your critical temperature control problems



Specify CAMBION® ceramic thermoelectric components where highest performance, maximum packing density, maximum uniformity and maximum durability are prime requisites for demanding temperature control applications.

Military, space and avionics systems, baths, ovens, liquid-to-liquid and air-to-air heat exchange systems . . . for all sensitive component temperature control . . . CAMBION thermoelectric devices or systems can provide you extremely precise control, reliability and on-time delivery.

Designed to be used separately or incorporated in larger systems as series parallel arrays, a wide range of sizes and heat-pumping capacities may be obtained. CAMBION ceramic modules are available for immediate delivery from stock.

Get more information on these high-performance ceramic thermoelectrics for your temperature control problems. Talk to Gordon Bird at (617) 492-7082, or write to him direct in Cambridge - Cambridge Thermionic Corporation, 401 Concord Avenue, Cambridge, Massachusetts 02138.

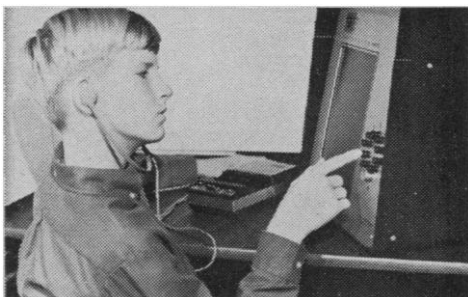
Standardize on

# CAMBION®

The guaranteed electronic component assemblies

Circle No. 108 on Readers' Service Card

## A NEW CONCEPT IN FRANCHISING



### Exceptional Opportunity with **ELECTRONIC LEARNING**

No experience in teaching field  
is required with . . .

### New, Revolutionary Automated System

Learning Foundations offers the ultimate investment for a qualified investor:

- **A DIGNIFIED BUSINESS** that offers profit, prestige and security. A Learning Foundations licensee gains community respect and recognition while meeting critical educational needs of his community.
- **SIMPLE TO OPERATE.** Minimum supervision. No classes or lectures. Each student is individually scheduled and progresses according to his individual ability.
- **EXCEPTIONAL PROFIT POTENTIAL** with full utilization of 26-student unit for just 2 hours daily.
- **TOTAL MARKET.** Appeals to practically everyone - all ages. 67% of all students need help in one or more subjects. Enrichment programs and college preparatory courses provide a total student market which is supplemented by industrial training and adult education.
- **LICENSEES REAP PROFITS** in each of the following: Pre-school readiness, tutoring for grades 1-12, study skills, preparatory course for College Boards, specialty courses for business and industry, management development, typing, adult basic education and leisure learning.

Today, while your area may still be open for a valuable Learning Foundations distributorship or electronic learning center license, is the time for you to act. If you have an excellent reputation, sound credit, are willing to invest \$25,000 to \$35,000, and want further information, call or write for full details.

## Learning Foundations International, Inc.

LEARNING FOUNDATIONS BUILDING, ATHENS, GEORGIA 30601, (404) 549-8446

1046

Circle No. 88 on Readers' Service Card

Advertisers judge their advertising results by the number of responses to their ads. They also pay half the publishing cost of Science. Use the Readers' Service Card to contact manufacturers.

SCIENCE, VOL. 165

Malatesta and F. Bonati. *Interscience* (Wiley), New York, 1969. viii + 200 pp., illus. \$8.50. *Interscience Monographs on Chemistry*.

**The Japan Expedition, 1852-1854.** The Personal Journal of Commodore Matthew C. Perry. Roger Pineau, Ed. Smithsonian Institution Press, Washington, D.C., 1968 (distributor, Random House, New York). xx + 244 pp. + plates. \$10.

**Kalambo Falls Prehistoric Site.** Vol. 1, The Geology, Palaeoecology and Detailed Stratigraphy of the Excavations. J. D. Clark, with contributions by G. H. Cole, E. G. Haldemann, M. R. Kleindienst, and E. M. van Zinderen Bakker. Cambridge University Press, New York, 1969. xvi + 256 pp., illus. + maps and plates. \$14.50.

**Laboratory Anatomy of the Elementary Chordates.** Robert B. Chiasson. Illustrated by the author. Brown, Dubuque, Iowa, 1969. viii + 45 pp., illus. Spiral bound, \$1.95. Booth Laboratory Anatomy Series.

**A Laboratory Manual on Abnormal Haemoglobins.** Prepared under the direction of J. H. P. Jonxis and T. H. J. Huisman. Blackwell Scientific Publications, Oxford, England, ed. 2, 1968 (U.S. distributor, Davis, Philadelphia). x + 126 pp. + plates. Paper, \$5.25.

**Lectures on the Comparative Pathology of Inflammation.** Delivered at the Pasteur Institute in 1891. Elie Metchnikoff. Translated from the French by F. A. Starling and E. H. Starling. Dover, New York, 1969. xxii + 230 pp., illus. Paper, \$2.75. Reprint, with a new introduction by Arthur M. Silverstein, of the 1893 edition.

**Linear Free Energy Relationships.** P. R. Wells. Academic Press, New York, 1968. x + 118 pp., illus. \$5.95.

**Macrophages and Immunity.** D. S. Nelson. North-Holland, Amsterdam; Interscience (Wiley), New York, 1969. xvi + 336 pp., illus. \$19.50. *Frontiers of Biology*, vol. 11.

**Magnetism in Metals and Alloys.** Advanced Course, Kjeller, Norway, 1968. Institutt for Atomenergi, Kjeller Research Establishment, Kjeller, Norway, 1969. vi + 274 pp., illus. Paper. Kjeller Report No. 132.

**Man and Nature.** An Anthropological Essay in Human Ecology. Richard A. Watson and Patty Jo Watson. Harcourt, Brace and World, New York, 1969. xii + 172 pp. Paper, \$2.95.

**Management and the Computer in Information and Control Systems.** Bartow Hodge and Robert N. Hodgson. McGraw-Hill, New York, 1969. xvi + 304 pp., illus. \$13.50.

**Manual for Laboratory Clinical Chemistry.** Albert Hanok. Geron-X, Los Altos, Calif., 1969. xx + 444 pp. \$12.

**Measurement of Air Pollutants.** Guide to the Selection of Methods. M. Katz. World Health Organization, Geneva, 1969 (U.S. distributor, American Public Health Association, New York). 124 pp. \$5.

**The Mediterranean Valleys.** Geological Changes in Historical Times. Claudio Vita-Finzi. Cambridge University Press, New York, 1969. x + 140 pp., illus. + plates. \$13.

**Morphology and Systematics of Coralline Algae with Special Reference to Caliarthron.** H. William Johansen. University of California Press, Berkeley, 1969.

## We've multiplied. By adding.

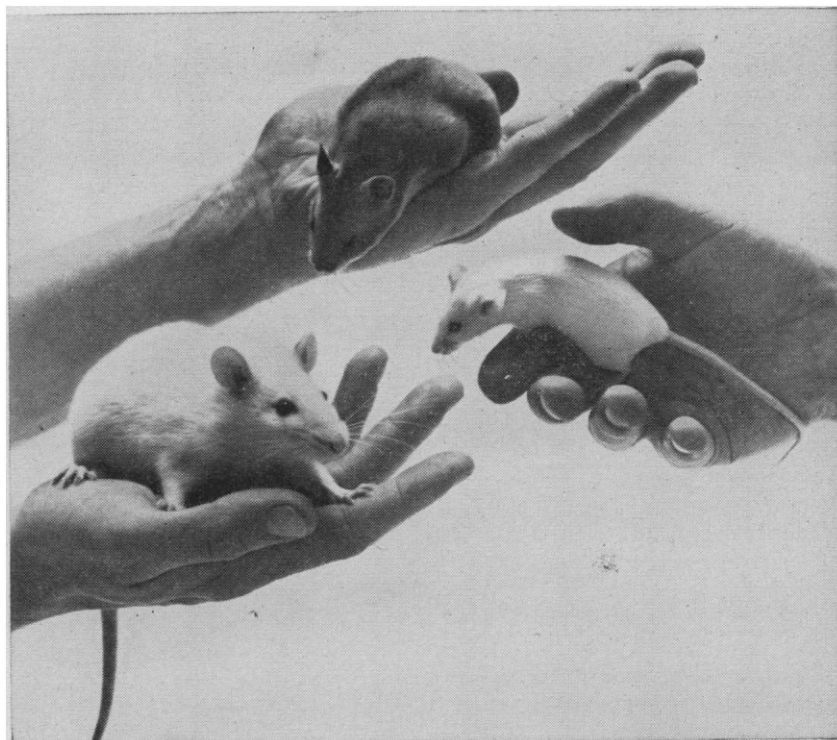
Our additions will help us help you. Because at Charles River in Wilmington, our new facilities help us deliver an extra 300,000 rats a year. Plus 300,000 more mice.

And at our expanded facilities in Elbeuf, France, we've increased the production potential for both animals by 50%.

We've even added a whole new subsidiary, the Lakeview Hamster Colony, Newfield, New Jersey. And they're planning a 25% increase in lab-quality hamsters this year.

It all adds up to fast, dependable delivery of COBS®, germfree or associated animals. When you need them. And where.

Why not capitalize on our growth story? Charles River Breeding Laboratories, Inc., Wilmington, Mass., or Charles River, Elbeuf, France.



Order a litter. Or a lot.

**Charles River**   
BREEDING LABORATORIES, INC. FROM THE  
HAND OF THE  
VETERINARIAN  
TO RESEARCH

Circle No. 33 on Readers' Service Card



# PHASE SEPARATING PAPER

The world's first, fast-acting, disposable separatory funnel

Whatman No. 1 PS is a water repellent paper that acts as a phase separator in place of conventional separatory funnels... separates aqueous solutions from water immiscible solutions, quickly and conveniently. Because it's hydrophobic, No. 1 PS retains the aqueous layer while allowing the organic layer to go through... filters out any solid that may be present at the time of filtration... and, because it's paper, it's disposable.

No. 1 PS makes prior separation of the phases in a separatory funnel completely unnecessary... saves considerable time and effort in solvent extraction. It gives a complete and rapid quantitative separation of the two liquid phases. There is no loss of materials as with ordinary separatory funnels. Can be used with organic solvents that are lighter or heavier than water.

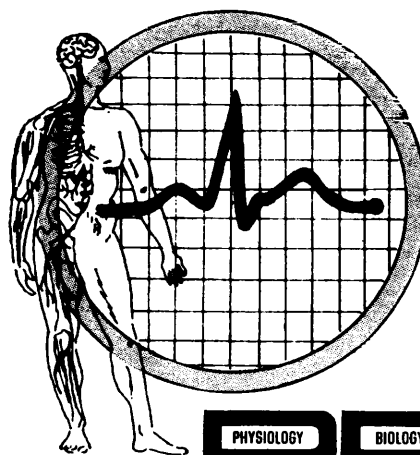
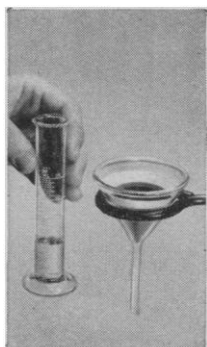
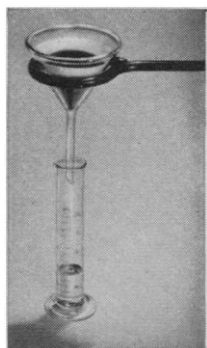
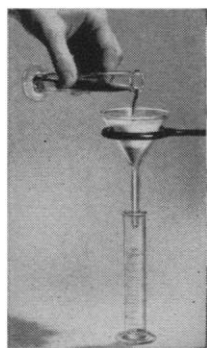
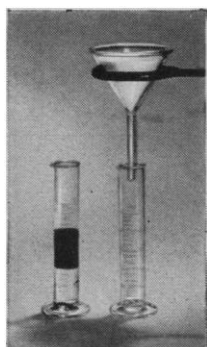
For further information, send for our free Phase Separating Paper Leaflet.

**Reeve angel**

H. Reeve Angel & Co., Inc.—Sole Distributor in North America  
9 Bridewell Place, Clifton, New Jersey 07014

H. Reeve Angel & Co., Ltd.—Sole Selling Agents  
14 New Bridge Street, London E. C. 4

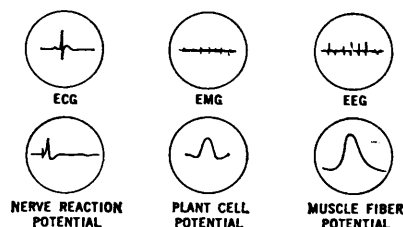
● WHATMAN is the registered trademark of W & R Balston Ltd., Maidstone, Kent, England.  
Circle No. 51 on Readers' Service Card



OSCILLOSCOPE  
BIO-AMPLIFIER  
STIMULATOR

**PB-3 SCOPE**

COMPACT • ECONOMICAL • VERSATILE

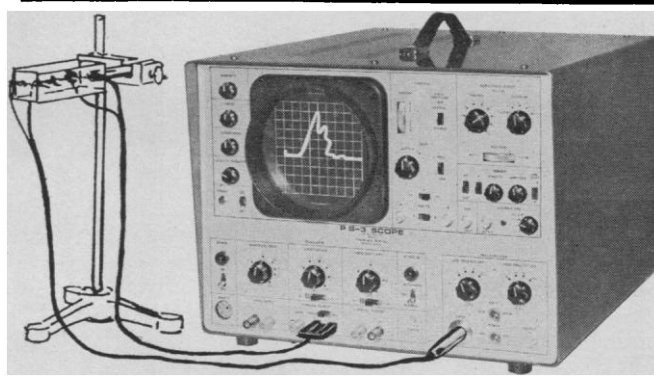


## PB-3 SCOPE SPECIFICATIONS

VERTICAL AMPLIFIER				
BAND WIDTH	SENSITIVITY	RISE TIME	IMPEDANCE	ACC.
D.C. to 50 KC	Oscilloscope 50 MV to 50V/CM Bio-amplifier in 10 $\mu$ V/CM to 100 MV/CM	Less than 7 $\mu$ sec.	Oscilloscope 1 Meg—Single End Bio-amplifier 20 Megs—Balanced 10 Megs—Single End	$\pm 5\%$
TIME BASE		CRT	STIMULATOR	PHYSICAL
SPEED	TRIGGERING	DIA.	PHOSPHOR	
10 $\mu$ sec. to 1 sec/cm	Internal or External Slope, + or —	5"	P7 (Filters available)	Amplitude .04 to 100 volt frequency 1 to 1000 cps Duration .04 to 32 ms
				DIM. & WT. 16" x 18" x 12" 45 lbs.

Catalog Number 7092—680

For 115 Vac 50-60 cycles 90 watts



**PHIPPS & BIRD, INC.**

Manufacturers & Distributors of Scientific Equipment  
6th & Byrd Streets — Richmond, Virginia  
For additional information write for Bulletin PB2-65

Circle No. 52 on Readers' Service Card



x + 98 pp., illus. Paper, \$3.50. University of California Publications in Botany, vol. 49.

**Mysterious Places.** Daniel Cohen. Dodd, Mead, New York, 1969. xvi + 240 pp. + 16 plates. \$5.95.

**Natural Resource Information for Economic Development.** Orris C. Herfindahl. Published for Resources for the Future by Johns Hopkins Press, Baltimore, 1969. xvi + 216 pp., illus. \$7.

**Neurosciences Research.** Vol. 2. S. Ehrenpreis and Othmar C. Solnitzky, Eds. Academic Press, New York, 1969. xvi + 336 pp., illus. \$18.50.

**New Approaches to Breeding for Improved Plant Protein.** Proceedings of a panel meeting. Röstänga, Sweden, 1968. International Atomic Energy Agency, Vienna, 1969. viii + 196 pp., illus. Paper, \$5. Panel Proceedings Series.

**Nuclear Structure.** Vol. 1, Single-Particle Motion. Aage Bohr and Ben R. Mottelson. Benjamin, New York, 1969. xiv + 474 pp., illus. \$25.

**Oceanographic Atlas of the Pacific Ocean.** Richard A. Barkley. University of Hawaii Press, Honolulu, 1968. 180 pp., illus. \$30.

**On Psychotherapy and Casework.** A Position Statement. Committee on Psychiatry and Social Work, Group for the Advancement of Psychiatry. GAP, New York, 1969. iv + pp. 21-48. Paper, \$1. GAP Report No. 71, vol. 7.

**Oppenheimer.** I. I. Rabi, Robert Serber, Victor F. Weisskopf, Abraham Pais, and Glenn T. Seaborg. Scribner, New York, 1969. x + 92 pp. + plates. \$5.95.

**A Paddling of Ducks.** Dillon Ripley. Illustrated by Francis Lee Jaques. Smithsonian Institution Press, Washington, D.C., 1969 (distributor, Random House, New York). 256 pp. \$5.95. Reprint of the 1957 edition.

**Paramedical Dictionary.** A Practical Dictionary for the Semi-Medical and Ancillary Medical Professions. J. E. Schmidt. Thomas, Springfield, Ill., 1969. vi + 426 pp. \$8.75.

**Peptides 1968.** Proceedings of the Ninth European Peptide Symposium, Orsay, France, 1968. E. Bricas, Ed. North-Holland, Amsterdam; Interscience (Wiley), New York, 1968. xvi + 348 pp., illus. \$17.50.

**Physical Principles and Techniques of Protein Chemistry.** Part A. Sydney J. Leach, Ed. Academic Press, New York, 1969. xiv + 530 pp., illus. \$24. Molecular Biology Series.

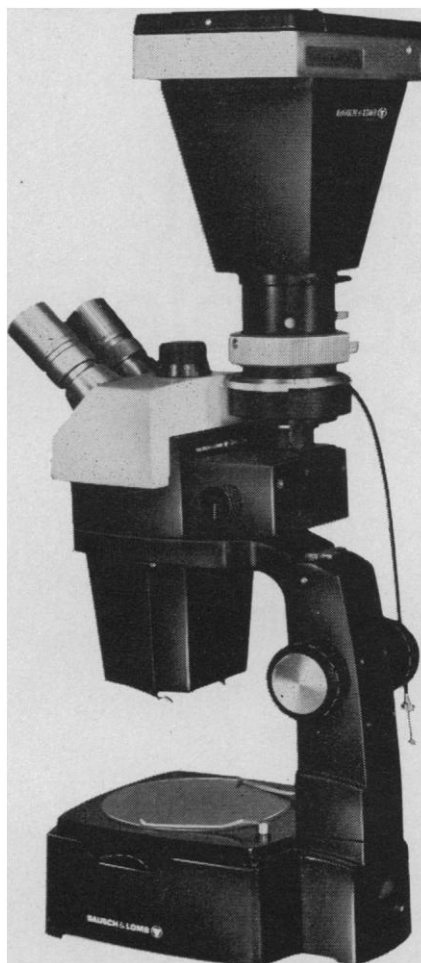
**Plant Science.** An Introduction to World Crops. Jules Janick, Robert W. Schery, Frank W. Woods, and Vernon W. Ruttan. Freeman, San Francisco, 1969. viii + 632 pp., illus. \$12. A Series of Books in Agricultural Science.

**Pollution. What It Is . . . What It Does . . . What Can Be Done About It.** W. J. Maunder and H. D. Foster, Eds. Evening Division, University of Victoria, Victoria, B.C., Canada, 1969. vi + 118 pp. Paper, \$1.50.

**Polyurethane Technology.** A seminar, Brooklyn, N.Y. Paul F. Bruins, Ed. Interscience (Wiley), New York, 1969. x + 294 pp., illus. \$14.95. Polymer Engineering and Technology Series.

**Practical Technical Writing.** Ritchie R.

# it's true!



StereoZoom® 7, just added to the matchless line of Bausch & Lomb Stereomicroscopes, now takes pictures. That's right, takes pictures.

There's an integrated camera system, which allows you to use a 35mm or 4" x 5" film; or 3 1/4" x 4 1/4" or 4" x 5" \*Polaroid camera, and start shooting. You might call it the StereoZoom 7 Triocular Photomicrographic System, because that's what it is.

It's also a multiplex system, because visual and photographic functions in no way interfere with each other. You can look while you shoot. And you know how important that is.

This photographic potential plus the widest zoom range, clearest viewing, highest magnification, and a sufficient variety of models make StereoZoom 7 the one you surely should find out about.

**Write for Catalog 31-2185 and our free demonstration offer. Bausch & Lomb, Scientific Instrument Division, 64221 Bausch St., Rochester, New York 14602.**

\*Reg. Polaroid Corp.

**BAUSCH & LOMB** 

**SCIENTIFIC INSTRUMENT DIVISION**

Circle No. 26 on Readers' Service Card

try this for size  
the lightweight  
**CTC\* JUNIOR**  
flexible,  
compact  
and completely  
reliable

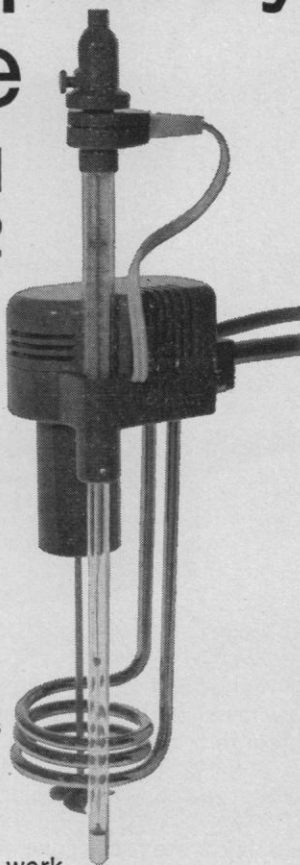
model  
22

Go ahead and try it  
in your own lab.

Converts any container  
into a constant  
temperature bath.

The CTC JUNIOR has  
a range of 0-100°C,  
with a uniformity of  
 $\pm 0.25^\circ\text{C}$ . For reliability  
it's got solid state  
circuitry and a brushless  
motor. And it displaces  
a mere 60 ml. of water.

See the CTC JUNIOR at work —  
in your own lab. Call your Bronwill dealer — or  
write directly to us — for a demonstration.



\*Constant Temperature Circulator



**BRONWILL SCIENTIFIC, INC.**

A leader in thermostatic instrumentation  
Box 7824 — Rochester, New York 14606

Ward. R. M. Ohmann, Consulting Editor.  
Knopf, New York, 1969. xxii + 264 pp.,  
illus. \$5.50.

**Prehistory of North America.** Jesse D.  
Jennings. McGraw-Hill, New York, 1969.  
xiv + 402 pp., illus. \$9.95.

**Probability and Stochastic Processes.**  
With a View Toward Applications. Leo  
Breiman. Houghton Mifflin, Boston, 1969.  
xii + 324 pp., illus. \$9.50. Houghton  
Mifflin Series in Statistics.

**Progress in Oceanography.** Vol. 5. A  
symposium, Rome, 1966. Mary Sears, Ed.  
Part 1, Robert W. Stewart, Ed. Part 2,  
Trygve Braarud, Ed. Pergamon, New  
York, 1969. xii + 196 pp., illus. \$11.

**Progress in Operations Research.** Vol.  
3, Relationship between Operations Re-  
search and the Computer. Julius S. Aro-  
nofsky, Ed. Wiley, New York, 1969. xii  
+ 564 pp., illus. \$18.75. Publications in  
Operations Research, No. 16.

**Psychic Photography.** Threshold of a  
New Science? Hans Holzer. McGraw-Hill,  
New York, 1969. x + 118 pp., illus.  
\$7.95.

**Rapid Determination of Aluminum in  
Rocks by Reactor Neutron Activation  
Analysis.** E. Steinnes. Institutt for Atom-  
energi, Kjeller Research Establishment,  
Kjeller, Norway, 1969. vi + 10 pp., illus.  
Paper. Kjeller Report No. 131.

**Rare Shells.** S. Peter Dance. University  
of California Press, Berkeley, 1969. 128  
pp. + 24 plates. \$17.

**Reflexes and Motor Integration.** Sher-  
rington's Concept of Integrative Action.  
Judith P. Swazey. Harvard University  
Press, Cambridge, Mass., 1969. xxii +  
276 pp., illus. \$6.50. Harvard Mono-  
graphs in the History of Science.

**Register of Scientific Research Person-  
nel in Irish Institutions as of January  
1968.** Royal Irish Academy, Dublin, 1968.  
x + 102 pp. Paper, £1.

**Rhythmic Phenomena in Plants.** B. M.  
Sweeney. Academic Press, New York,  
1969. x + 148 pp., illus. \$7. Experimental  
Botany, vol. 3.

**Run, Computer, Run.** The Mythology  
of Educational Innovation. Anthony G.  
Oettinger, with the collaboration of Sema  
Marks. Harvard University Press, Cam-  
bridge, Mass., 1969. xxii + 306 pp., illus.  
\$5.95. Harvard Studies in Technology and  
Society.

**Science in Antiquity.** Benjamin Farring-  
ton. Oxford University Press, New York,  
ed. 2, 1969. iv + 156 pp. Paper, \$1.50.

**The Science of Health.** Warren R.  
Guild, Robert E. Fuisz, and Samuel Bojar.  
Illustrated by Jerome N. Reicher. Prentice-  
Hall, Englewood Cliffs, N.J., 1969. xx +  
532 pp. \$8.95.

**Scientific Writing for Graduate Stu-  
dents.** A Manual on the Teaching of Sci-  
entific Writing. F. Peter Woodford, Ed.  
Rockefeller University Press, New York,  
1968. x + 190 pp. \$5.75. Council of Biol-  
ogy Editors Manual.

**Secret in the White Cell.** Case History  
of a Biological Search. Don Herbert and  
Fulvio Bardossi. Drawings by Muriel  
Fabrizio, Ruth Mandlebaum, and Pauline  
Thomas. Harper and Row, New York,  
1969. xiv + 162 pp. \$6.95. Frontier of  
Science Series.

**Self and Not-Self.** Macfarlane Burnet.  
Melbourne University Press, Carlton, Vic.

the  
world  
over



...more  
laboratories have  
standardized on  
Tygon plastic Tubing  
than on any  
other kind

Always insist on  
genuine

**TYGON<sup>®</sup>**  
**TUBING**

For your protection, every foot of genuine Tygon Tubing is branded with the Tygon name and formulation number.

crystal-clear • chemically inert  
non-oxidizing • 73 standard sizes

At laboratory supply houses everywhere,  
or write Norton Plastics and Synthetics  
Division, Akron, Ohio 44309.

**NORTON**

**PLASTICS & SYNTHETICS DIV.**

FORMERLY U.S. STONEWARE INC.  
AKRON, OHIO 44309

32-144

Circle No. 79 on Readers' Service Card

toria, Australia; Cambridge University Press, New York, 1969. xiii + 320 pp., illus. + 8 plates. Cloth, \$8.50; paper, \$2.95. Cellular Immunology, Book 1.

**Semantic Differential Technique.** A Sourcebook. James G. Snider and Charles E. Osgood, Eds. Aldine, Chicago, 1969. xiv + 682 pp., illus. \$12.50.

**Sexual Function and Dysfunction.** Proceedings of a symposium, Philadelphia, 1967. Paul Jay Fink and Van Buren O. Hammett, Eds. Davis, Philadelphia, 1969. xii + 208 pp., illus. \$9.

**The Sociology of Research.** Gunnar Boalt. Southern Illinois University Press, Carbondale; Feffer and Simons, London, 1969. xxxviii + 170 pp. \$5.95. Perspectives in Sociology.

**Spring Flora of Minnesota.** Including Common Cultivated Plants. Thomas Morley. University of Minnesota Press, Minneapolis, ed. 2, 1969. ii + 286 pp., illus. \$7.75.

**Technology, Engineering, and Economics.** Philip Sporn. M.I.T. Press, Cambridge, Mass., 1969. xii + 148 pp., illus. \$5.95.

**Testing of Polymers.** Vol. 4. William E. Brown, Ed. Interscience (Wiley), New York, 1969. viii + 480 pp., illus. \$22.50.

**Textbook of Cytology.** Walter V. Brown and Eldridge M. Bertke. Mosby, St. Louis, 1969. xii + 612 pp., illus. \$14.

**Theory of Measurement.** J. Pfanagl, in cooperation with V. Baumann and H. Huber. Wiley, New York, 1968. 236 pp. \$11.50.

**Through Rugged Ways to the Stars.** Harlow Shapley. Scribner, New York, 1969. x + 180 pp. + illus. \$6.95. Scribners Scientific Memoirs.

**Time, Change and Contradiction.** Twenty-second Arthur Stanley Eddington Memorial Lecture, Cambridge, England, 1968. G. H. von Wright. Cambridge University Press, New York, 1969. 32 pp., illus. Paper, 95¢.

**Tissue Repair.** R. M. H. McMinn, with a chapter by J. J. Pritchard. Academic Press, New York, 1969. xii + 432 pp., illus. \$23.50.

**The Triumph of the Darwinian Method.** Michael T. Ghiselin. University of California Press, Berkeley, 1969. x + 290 pp., illus. \$7.50.

**Two-Stroke Power Units.** Their Design and Application. P. E. Irving. Hart, New York, 1968. 288 pp., illus. \$10.

**Udhëqesues I Dashur E I Shtrenjte I Partise E I Popullit Tone.** Shtëpia Botonjese "Naim Frashëri," Tiranë, Albania, 1968. 84 pp., illus.

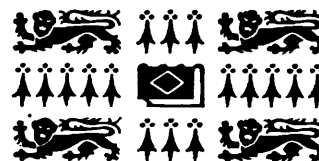
**Ultrasonic Methods in Solid State Physics.** Rohn Truell, Charles Elbaum, and Bruce B. Chick. Academic Press, New York, 1969. xiv + 466 pp., illus. \$19.75.

**Water, Health and Society.** Selected Papers by Abel Wolman. Gilbert F. White, Ed. Indiana University Press, Bloomington, 1969. xii + 404 pp., illus. \$15.

**Wing Theory in Supersonic Flow.** Elie Carafoli, with the cooperation of Dan Mateescu and Adriana Nastase. Pergamon, New York, 1969. xiv + 594 pp., illus. \$22. International Series of Monographs in Aeronautics and Astronautics, vol. 7.

**The Year Book of the Royal Society of London, 1969.** Royal Society, London, 1969. 412 pp. \$2.75.

**CAMBRIDGE**



**UNIVERSITY PRESS**

**Cellular Immunology**  
(Books 1 and 2)

**Cellular Immunology**  
(Book 1: Self and Not-Self)

SIR MACFARLANE BURNET

A comprehensive account based on the clonal selection theory. Book 1, available separately, is for biologists interested in immunology but not necessarily concerned with research. Book 2, for the specialist, cites the documented evidence for the theory as outlined in Book 1.

Cellular Immunology (Books 1 and 2 combined) Cloth \$18.50

Book 1: Self and Not-Self Cloth \$5.00  
Paper \$2.95

**The Relations between  
the Sciences**

C. F. A. PANTIN

Edited by A. M. PANTIN and  
W. H. THORPE

A discussion of the essential characteristics of the various sciences and their similarities and differences. The important distinction made is between the restricted, or physical, sciences and the unrestricted, or biological, sciences.

"Fascinating reading."—*New Scientist*  
\$7.50

**Defects and Radiation  
Damage in Metals**

M. W. THOMPSON

Following a description of the nature of lattice defects in metal crystals, the author discusses radiation damage and considers the contribution made by the study of irradiated metals to our general knowledge of defects. He includes modern developments in understanding collision cascades, the clustering of point defects and the behavior of impurities induced by irradiation.

\$18.50

**CAMBRIDGE UNIVERSITY  
PRESS**

32 East 57th Street  
New York, N.Y. 10022

Circle No. 76 on Readers' Service Card