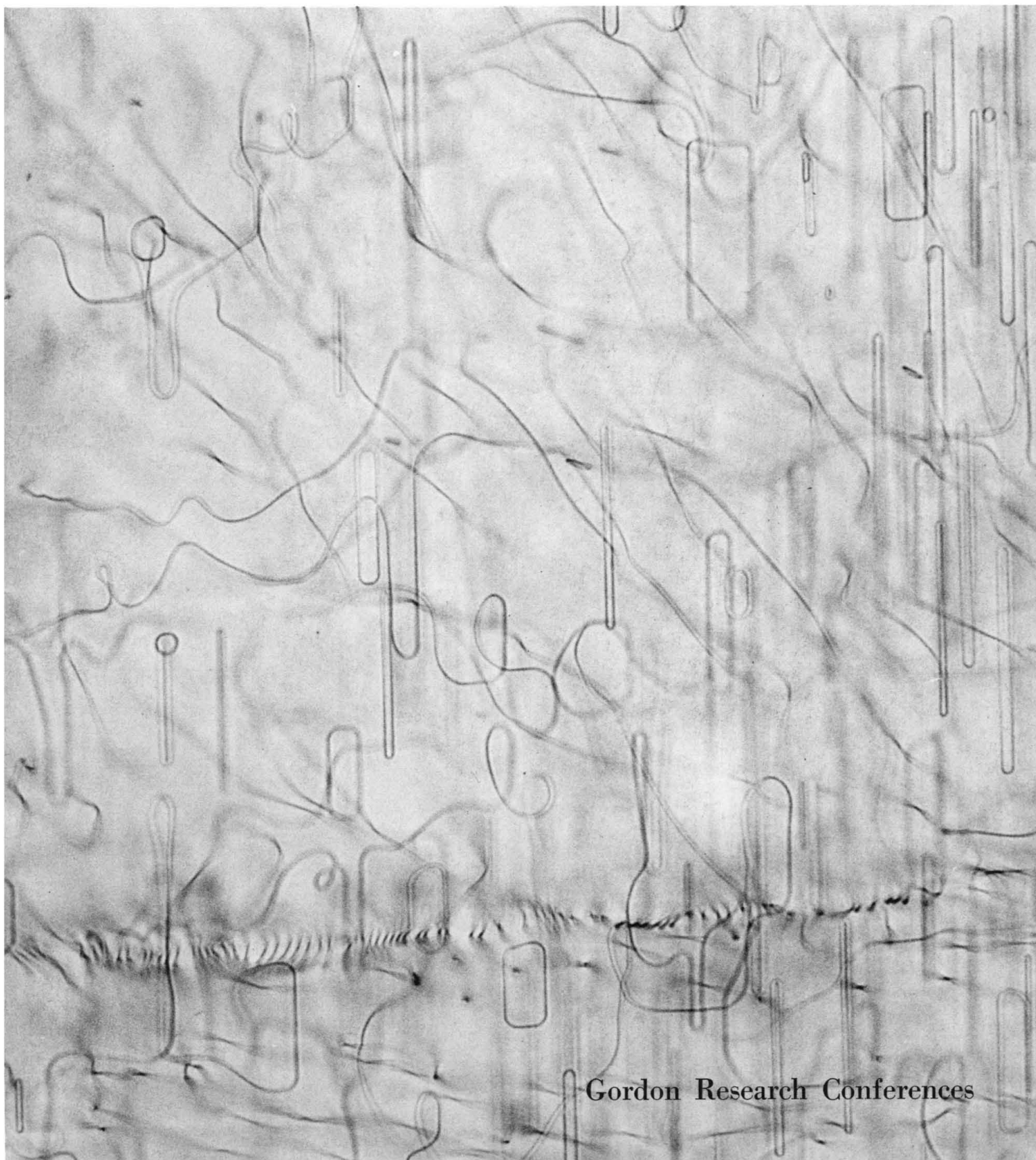


SCIENCE

12 March 1976

Volume 191, No. 4231

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



Gordon Research Conferences

Beckman J-21B: the centrifuge that started the quiet revolution is today's best value.

J-21B users have good reason to smile. They own the best high-speed refrigerated centrifuge made today.

In addition to its quiet operation, the J-21B has a high-torque dc drive that gets rotors to speed fast, and an automatic vacuum system that reduces wind friction, increases drive and brush life, and makes it possible for nearly every J-21B rotor to produce more centrifugal force than comparable rotors.

The J-21B offers you a full line of fixed-angle and swinging-bucket rotors, complete with a wide variety of adapters and tubes. For larger volumes, there is also the incomparable JCF-Z rotor for separations by continuous flow, zonal, and re-orienting gradient techniques—all in one rotor body with interchangeable cores.

You can start a quiet—and more efficient—revolution in your lab by buying a J-21B. Send for brochure SB-366 to Beckman Instruments, Inc., Spinco Division, 1117 California Ave., Palo Alto, CA 94304.

Beckman

Circle No. 357 on Readers' Service Card



4051 personal computing:

Ask a BASIC question, get a Graphics answer.

Compare Tektronix' 4051 to any other compact computing system. There's a Graphic contrast.

Wide-ranging performance right at your desk. BASIC power. Graphics power. Terminal capability. You've got instant access to answers, all from one neat package.

Easy-to-learn, enhanced BASIC. We took elementary, English-like BASIC, and beefed it up for more programming muscle. We've designed it with MATRIX DRAW, features like VIEWPORT,

WINDOW, and ROTATE, to help you get your teeth into Graphics almost instantly.

There's a Graphic contrast.

The 4051 will handle most application problems. But for your most complex problems, the 4051's Data Communications Interface option can put you on-line to powerful Graphic applications that no stand alone system can tackle.

Just \$6995.* Less than most comparable alphanumeric only systems. Including 8K workspace, expandable to 32K, with 300K byte cartridge tape drive, full Graphics CRT, upper/lower case, and all the BASIC firmware.

Talk to Tektronix today! Your local Sales Engineer will fill you in on our 4051 software. Our range of peripherals. Our flexible purchase and lease agreements. And he'll set up a demonstration right on your desk. Call him right now, or write:

Tektronix, Inc.
Information Display Group
P. O. Box 500
Beaverton, Oregon 97077



TEKTRONIX®

Circle No. 351 on Readers' Service Card



*U.S. Domestic price only.

12 March 1976

Volume 191, No. 4231

SCIENCE

LETTERS	Nuclear Power Regulation: <i>A. W. Murphy</i> and <i>D. B. La Pierre</i> ; <i>P. M. Boffey</i> ; Disclosure of Grant Applications: <i>T. D. C. Kuch</i> ; <i>L. P. Burd</i> ; Heart Disease Prevention Trials: <i>J. C. Cassel</i> et al.; Health Statistics: <i>P. Erickson</i> ; Climate Research: <i>J. A. Laurmann</i>	1000
EDITORIAL	Synthetic Rubber in World War II: <i>A. M. Bueche</i>	1007
ARTICLES	Ocean Boundaries and Petroleum Resources: <i>H. D. Hedberg</i>	1009
	Psychiatric Labeling in Cross-Cultural Perspective: <i>J. M. Murphy</i>	1019
NEWS AND COMMENT	Breast Cancer: Reports of New Therapy Are Greatly Exaggerated	1029
	Science Indicators: New Report Finds U.S. Performance Weakening	1031
	Science for the People: Comes the Evolution	1033
	Foreign Intelligence Advisory Board: A Lesson in Citizen Oversight?	1035
RESEARCH NEWS	Lithium: Will Short Supply Constrain Energy Technologies?	1037
BOOK REVIEWS	Reconstructing Complex Societies, <i>reviewed by R. L. Schuyler</i> ; Mathematics and Computers in Archaeology, <i>D. W. Read</i> ; Concepts of Inorganic Photochemistry, <i>J. I. Zink</i> ; Structure of Metallic Catalysts, <i>R. L. Burwell, Jr.</i> ; Biochemical Actions of Hormones, <i>C. A. Villee</i> ; Genetic Manipulations with Plant Material, <i>A. W. Galston</i> ; Books Received	1039

BOARD OF DIRECTORS	MARGARET MEAD Retiring President, Chairman	WILLIAM D. MC ELROY President	EMILIO Q. DADDARIO President-Elect	RICHARD H. BOLT KENNETH B. CLARK	JOEL COHEN RUTH M. DAVIS
CHAIRMEN AND SECRETARIES OF AAAS SECTIONS	MATHEMATICS (A) Stanislaw M. Ulam Truman A. Botts	PHYSICS (B) Freeman J. Dyson Rolf M. Sinclair	CHEMISTRY (C) Henry A. Hill Leo Schubert	ASTRONOMY (D) Robert B. Leighton Arlow U. Landolt	
	PSYCHOLOGY (J) Wilbert J. McKeachie Edwin P. Hollander	SOCIAL AND ECONOMIC SCIENCES (K) William H. Sewell Daniel Rich	HISTORY AND PHILOSOPHY OF SCIENCE (L) Kenneth F. Schaffner George Basalla	ENGINEERING (M) Walter R. Hibbard, Jr. Paul H. Robbins	
	EDUCATION (Q) Mary Budd Rowe James T. Robinson	DENTISTRY (R) James K. Avery Sholom Pearlman	PHARMACEUTICAL SCIENCES (S) Joseph P. Buckley Raymond Jang	INFORMATION, COMPUTING, AND COMMUNICATION (T) Burton W. Adkinson Joseph Becker	
DIVISIONS	ALASKA DIVISION Donald W. Hood Chairman, Executive Committee	Keith B. Mather Executive Secretary	PACIFIC DIVISION Richard Walker President	Alan E. Leviton Secretary-Treasurer	SOUTHWESTERN AND ROCKY MOUNTAIN DIVISION M. Michelle Baker President
					Max P. Dunford Executive Officer

SCIENCE is published weekly, except the last week in December, but with an extra issue on the fourth Tuesday in November, 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. and additional entry. Copyright ©1976 by the American Association for the Advancement of Science. Member rates on request. Annual subscription \$50; foreign postage: Canada \$10, Americas \$12, overseas \$14, air lift to Europe, \$30. Single copies \$2 (back issues \$3) except Materials Issue (20 Feb. 1975) is \$3 and Guide to Scientific Instruments is \$6. School year subscription: 9 months \$37.50; 10 months \$41.75. Provide 6 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

REPORTS	New Technique for Decorating Dislocations in Olivine: <i>D. L. Kohlstedt et al.</i>	1045
	Bioluminescent Countershading in Midwater Animals: Evidence from Living Squid: <i>R. E. Young and C. F. E. Roper</i>	1046
	Heavy Methanes as Atmospheric Tracers: <i>G. A. Cowan et al.</i>	1048
	Angiotensin-Converting Enzyme: Vascular Endothelial Localization: <i>P. R. B. Caldwell et al.</i>	1050
	Egg Transport in the Rabbit Oviduct: The Roles of Cilia and Muscle: <i>S. A. Halbert, P. Y. Tam, R. J. Blandau</i>	1052
	Segmentation in Cinema Perception: <i>J. M. Carroll and T. G. Bever</i>	1053
	Brain Wave Components of the Contingent Negative Variation in Humans: <i>J. W. Rohrbaugh, K. Sydulko, D. B. Lindsley.</i>	1055
	<i>Technical Comments: Photochemical Smog Systems: Heterogeneous Decay of Ozone: F. H. Shair; D. L. Fox, R. Kamens, H. E. Jeffries</i>	1057
MEETINGS	Gordon Research Conferences: <i>A. M. Cruickshank</i>	1059
PRODUCTS AND MATERIALS	Cardiac Data Acquisition; Atomic Absorption Spectrophotometer; Strip Chart Recorders; Analytical Electron Microscope; Heat Shrinkable Tubing Connectors; Computing Radiometer; Conference Microscope System; Magnetic Tape Recorder; Tethered Current Meter; Ultraviolet-Visible Detector; Blood Collection Capillary Centrifuge Tube; Allergy Testing; Grating Monochromator; Widefield Spotting Scopes; Secondary Ion Mass Spectrometer; Literature.	1096

MIKE MC CORMACK FREDERICK MOSTELLER	CHAUNCEY STARR CHEN NING YANG	WILLIAM T. GOLDEN Treasurer	WILLIAM D. CAREY Executive Officer
--	----------------------------------	--------------------------------	---------------------------------------

GEOLOGY AND GEOGRAPHY (E) Helen L. Cannon Ramon E. Bisque	BIOLOGICAL SCIENCES (G) Edwin L. Cooper Jane C. Kaltenbach	ANTHROPOLOGY (H) Daniel G. Mandelbaum Philleo Nash
MEDICAL SCIENCES (N) Harold Wayland Richard J. Johns	AGRICULTURE (O) Orville G. Bentley J. Lawrence Apple	INDUSTRIAL SCIENCE (P) Burton V. Dean Robert L. Stern
STATISTICS (U) Emanuel Parzen Ezra Glaser	ATMOSPHERIC AND HYDROSPHERIC SCIENCES (W) Fred D. White Stanley A. Changnon, Jr.	GENERAL (X) Gordon J. F. MacDonald Joseph F. Coates

COVER

Low density of decorated dislocations in an olivine-rich xenolith from Kilbourne Hole, Texas. See page 1045. [D. L. Kohlstedt *et al.*, Department of Earth and Planetary Sciences, Massachusetts Institute of Technology, Cambridge, Massachusetts]

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. Postmaster: Send Form 3579 to SCIENCE, 1515 Massachusetts Avenue, NW, Washington, D.C. 20005.

WHEN YOU BUY A GOULD PRINTER/PLOTTER, IT'S A PACKAGE DEAL.

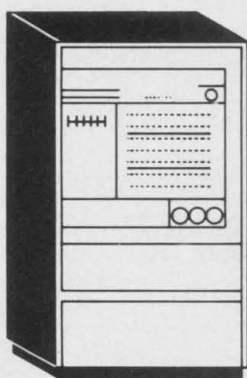
A Gould electrostatic printer/plotter is like two machines wrapped up into one neat little package.

It can do the work of a printer and a drum plotter. And it can do it fast, on-line. As much as 800 times faster than drum or pen plotters.

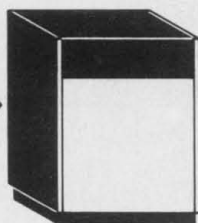
SOFTWARE IS EASY TO USE.

As important as powerful hardware is, we know that being able to talk to your CPU is just as important. So we give you easy-to-use software like our PLOT package which provides plotting and line printer emulation.

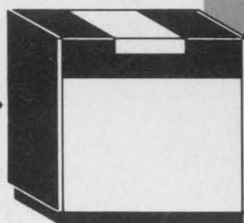
Plus direct on-line DMA interfaces for the IBM 360/370, NOVA/ECLIPSE, PDP-11 and HP 2100.



On-line operation-computer



Controller



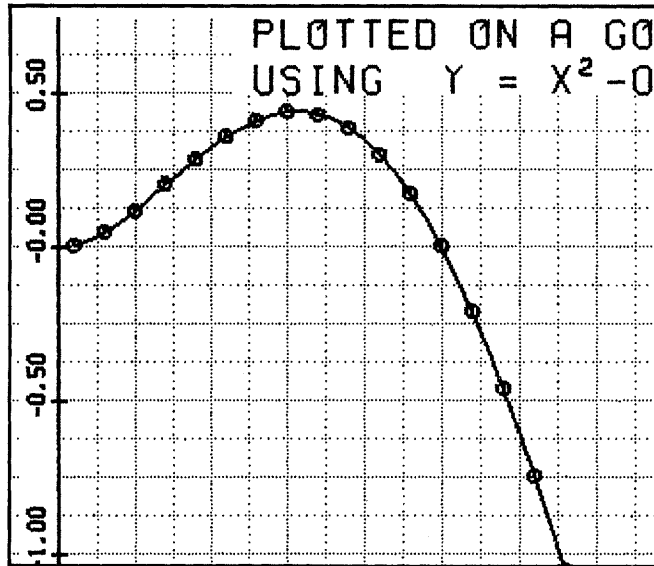
Gould printer/plotter



What's more, the whole package comes ready to go. Because Gould printer/plotters are installed as complete systems.

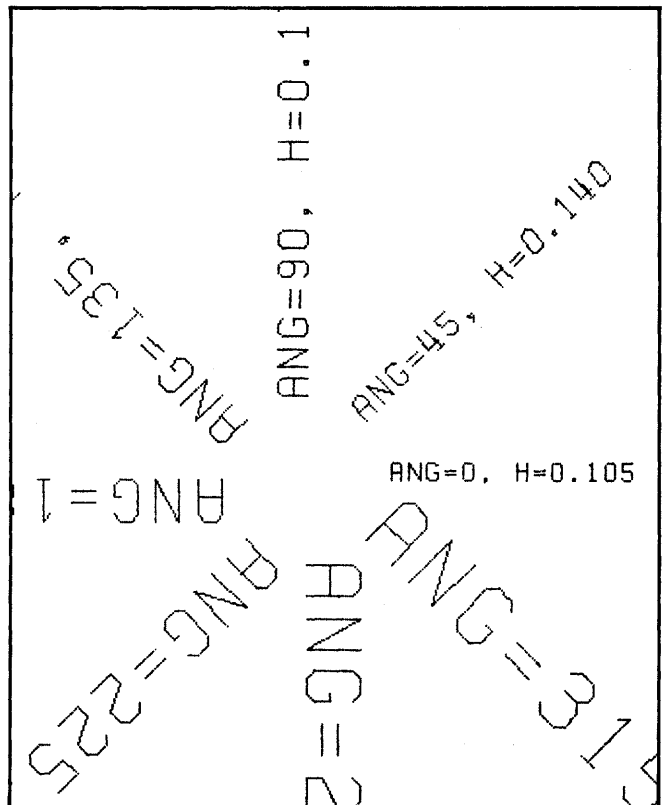
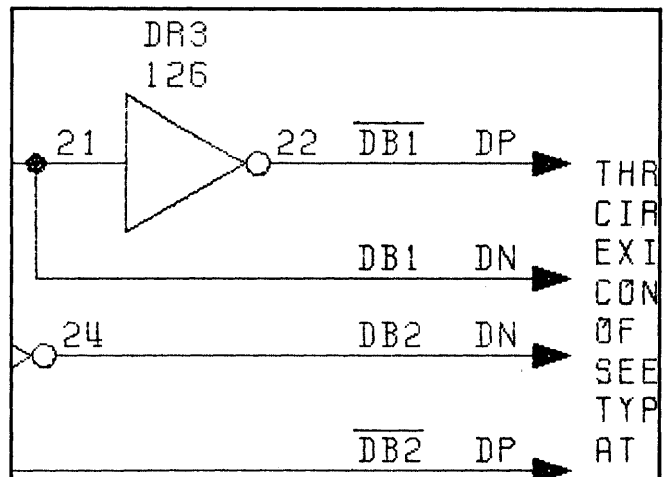
UNMATCHED GRAPHICS AND PRINT-OUT.

This is part of the Gould package too. Because with our patented-dielectric paper, toner head and matrix approach to getting dots on paper, you always get high-density, crisp, readable copy. Whether it's engineering or scientific drawings, diagrams, charts or alpha-numerics.



	LATEST FINISH	SCHED. FINISH	SLACK	73
				0
8	10/25/73		0.0	▲
8	10/25/73		0.0	▲
8	11/01/73		0.0	▲
8	11/01/73		0.0	▲
8	11/08/73		0.0	▲
8	11/08/73		0.0	▲
8	03/06/74		13.0	▲
8	12/07/73		1.0	▲
8	11/30/73		0.0	▲
8	01/22/74		7.0	▲

SYMBOLS AVAILABLE IN	
10	26
11	27
12	28
13	29
42	43
44	45
58	59
60	61
74	75
76	77



ALL THE SUPPORT YOU NEED.

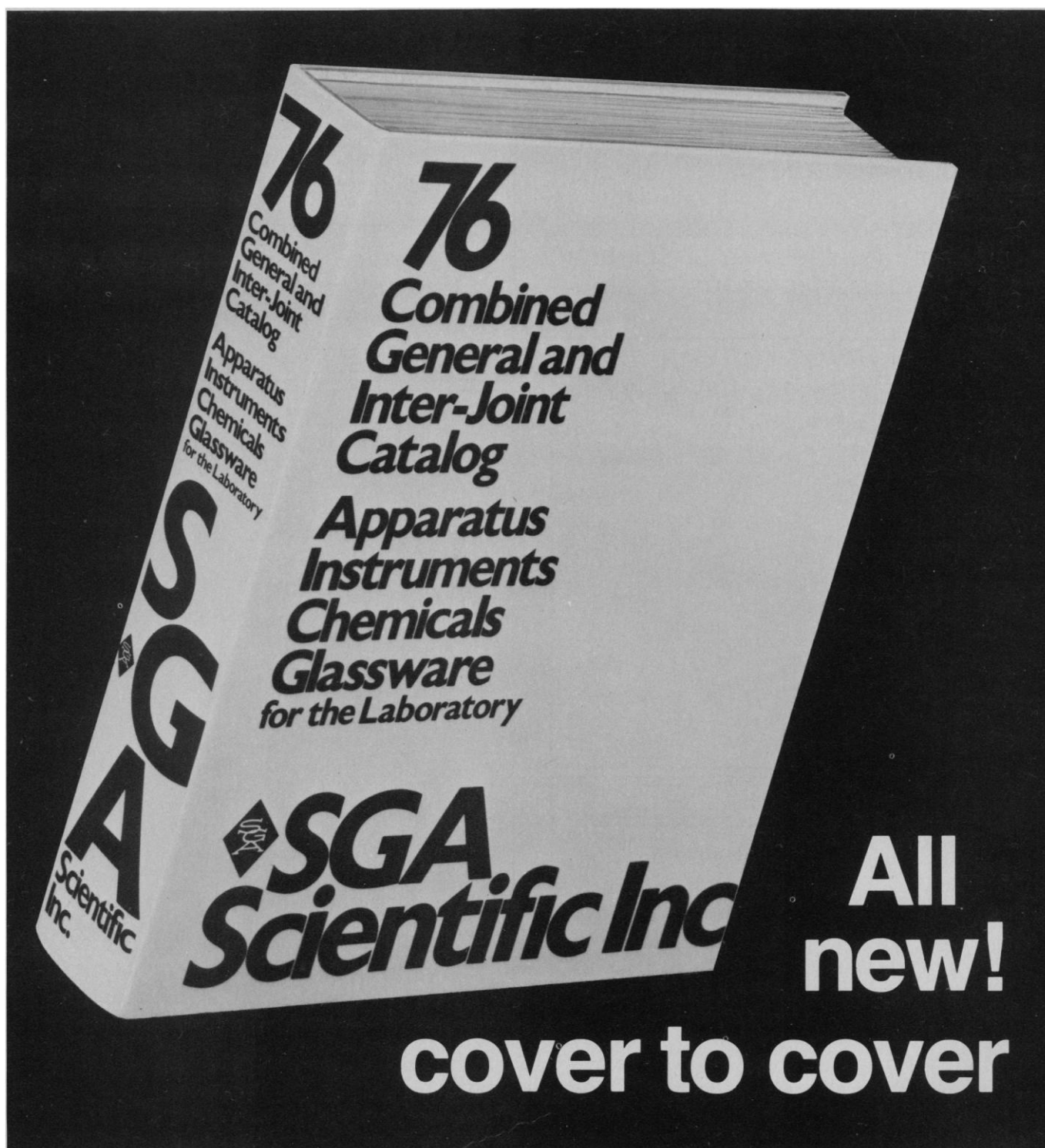
Don't worry about equipment support when you deal with Gould. Our package comes complete with a service organization. Backed by Gould's own factory-trained service technicians.

So cut yourself in on a package deal. For our free color catalog, write Gould Inc., 3631 Perkins Avenue, Cleveland, Ohio 44108.

GOULD

Circle No. 354 on Readers' Service Card

**FOR INFORMATION
CALL TOLL FREE (800) 648-4990.**



New outside. New inside. 1376 pages, packed with brand new product information. Over 1000 pages of up to the minute instrumentation, apparatus, accessories and supplies selected to meet every laboratory requirement from routine testing to precision analytical procedures. Nearly 300 pages of interchangeable glassware, fabricated in our own plant. Two complete catalogs, bound together, separated by a cross referenced index. *Request your copy, using your official letterhead: SGA Scientific Inc., 735 Broad Street, Bloomfield, New Jersey 07003, or from any of our branch offices.*

SGA Scientific Inc.

Branches: Boston, Mass./Elk Grove Village, Ill./Fullerton, Calif./New Haven, Conn./Philadelphia, Pa./Silver Spring, Md./Syracuse, N Y



LS users, are you tolerating someone else's tolerances?



Well, now you can stop when it comes to your liquid scintillation work. Set your own standards, save instrument time, reduce costs, and gain true multiuser flexibility. Simply switch now to the field-proven Beckman LS 3100 System.

This no-waiting liquid scintillation counter comes *standard* with three totally complete channels—each with its own preset error control. So you won't have to count against some generalized time that's "good for the group," or wait in line to load up. Even while the instrument is operating, additional samples can be loaded and set to run for individually optimized statistics. That's true multiuser flexibility.

Truly improved results are further enhanced by Iso-Set™ Modules, user-calibrated, plug-in fixed or variable windows that reduce setup time and improve accuracy.

In short, superior performance is standard with the LS 3100 System. Superior options like Automatic Quench Compensation (AQC) and an additional 12-channel accessory complete the picture of your best liquid scintillation counter buy.

So don't wait in line. Contact us now. Scientific Instruments Division, Beckman Instruments, Inc., P.O. Box C-19600, Irvine, California 92713.

Beckman

Circle No. 321 on Readers' Service Card



BECKMAN



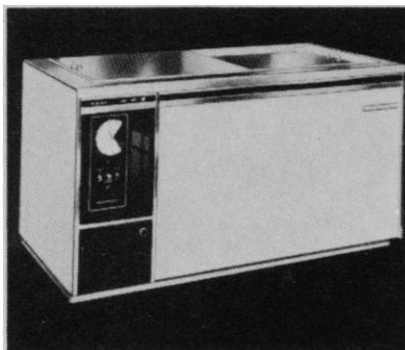
K-K-K-KEL-VI-VINATOR. -96°C !

We sell ultra-cold. Hair-cracking cold. Upright drops to -76°C . Chest model sinks to -96°C . And in over-all performance, we're the hottest cold buy around.

We know what you need in the way of cold so we've designed our units to make you happy. Take the upright. Beyond the cold you need, you'll find convenience features like six French doors. Open one without losing the cold everywhere else. You can label each door. Know what's behind it.

What's good about the chest model? It gets colder. And the top can give you some more work surface. And here too we've come up with a great way for you to identify the location of everything that's in it.

More. Both have automatic alarm systems and 2" portholes to accommodate recorders. More importantly, both carry the name Kelvinator Commercial. The company that knows how to give you the best cold you ever had.



Circle No. 428 on Readers' Service Card

Send for detailed literature.

Upright UC-105 ($-76^{\circ}\text{C}/-105^{\circ}\text{F}$)
— 12 Cubic Feet.
Chest UC-520 ($-85^{\circ}\text{C}/-120^{\circ}\text{F}$),
UC-540 ($-96^{\circ}\text{C}/-140^{\circ}\text{F}$)
— 12 Cubic Feet.

Write: J. E. Hirssig, Sales Mgr.,
Scientific and Industrial Division,
Kelvinator Commercial Products, Inc.,
621 Quay Street, Manitowoc, Wisconsin 54220. Phone (414) 682-0156.

*See Ultra Cold: Annual Meetings of
American Society for Microbiology
and Tissue Culture Association.*

Kelvinator

One of the White Consolidated Industries



SCIENCE, VOL. 191



Test-weigh the new 1976 Mettler compacts. You'll like the way they travel.

Lean, light and nimble, the new compact Mettler PL300 and PL3000 are two rugged electronic balances that don't have to be parked in the same place all the time. They can be moved around to different locations and be ready for action immediately. No leveling or arresting required. They're not affected by minor level changes.

The PL300 and PL3000 have sleek, modern lines and a very low profile, which means you can comfortably operate the balances from a sitting position. You can fit one in a space no bigger than what a standard 8½ x 11 inch writing pad would require.

You get the same easy operation with these balances as with our larger electronic models—one control bar tares and turns the instrument on or off. And you

also get the same high-quality craftsmanship that has made Mettler the preferred balance throughout the world.

PL300, which sells for \$1995, has a capacity of 300 g and a readability of 0.01 g. PL3000, priced at \$2295, offers 3000 g capacity and 0.1 g readability.

Put yourself behind the control bar of one of these speedy compacts. Ask your Mettler dealer to let you test-weigh it now. Or for more information, write to us directly: Mettler Instrument Corporation, Box 100, Princeton, NJ 08540.

Mettler

Circle No. 308 on Readers' Service Card



Now your J.T. Baker distributor can also ship you things he doesn't have!

How can your Baker distributor ship you things he doesn't have? Easy. He now can immediately contact the Baker Super Service Center and—in almost every instance—have the desired item shipped directly to you within 24 hours. *It's as though your J. T. Baker distributor has just added the largest reagent warehouse in the world to his backyard to serve you.* (To super-serve you.)

Now depend on your nearest Baker distributor for *all* of your laboratory reagent needs. He's listed on the facing page.

And do you have our new 428-page Catalog 750 featuring thousands of Baker quality laboratory chemicals? If not, please write. Thanks.

And, of course, J. T. Baker's Super Service is also available for...

NEW BIOCHEMICALS AND LSC PRODUCTS.

Biochemicals

These key biochemicals are now available with "Baker Analyzed" quality ... proven pure by actual lot analysis. Most meet NAS/NRC specifications and additional criteria. For example:

N-Acetyl-L-cysteine, DL-Alanine, D-Arabinose, L-Asparagine Monohydrate

LSC Cocktails

Every lot exhaustively performance-tested. Many new cocktails including one for RIA.

LSC Cocktail Reagents

Scintillators, solvents, and gelling agents/solubilizers for mixing your own cocktails. Use-tested, too.



J. T. Baker Chemical Co.,
222 Red School Lane,
Phillipsburg, N.J. 08865
201 859-5411

J.T. Baker

SUPER SERVICE DISTRIBUTORS

NORTHEAST

Ace Scientific Supply Co. Inc.
Linden, N.J.
201 / 925-3300

Albany Laboratories, Inc.
Albany, N.Y.
518 / 434-1747

Beckman Instruments Inc.
Mountainside, N.J.
201 / 232-7600

Berg Chemical Co.
New York, N.Y.
212 / 563-2684

J. & H. Berge, Inc.
South Plainfield, N.J.
201 / 561-1234

Brand-Nu Laboratories Inc.
Meriden, Conn.
203 / 235-7989

Curtin-Matheson Scientific Co.
Wayne, N.J.
201 / 278-3300

Curtin-Matheson Scientific Co.
Woburn, Mass.
617 / 935-8888

Doe & Ingalls, Inc.
Medford, Mass.
617 / 391-0090

Duso Chemical Co. Inc.
Poughkeepsie, N.Y.
914 / 454-6500

Eastern Scientific Co.
Providence, R.I.
401 / 831-4100

Healthco Scientific
Canton, Mass.
617 / 828-3310

Kem Chemical
Mt. Vernon, N.Y.
914 / 699-3110

New York Lab Supply Co.
West Hempstead, N.Y.
516 / 538-7790

Sargent-Welch Scientific Co.
Springfield, N.J.
201 / 376-7050

SciChem Co.
Everett, Mass.
617 / 389-7000

SGA Scientific Inc.
Bloomfield, N.J.
212 / 267-9451

Arthur H. Thomas Company
Philadelphia, Pa.
215 / 574-4500

VWR Scientific
Rochester, N.Y.
716 / 288-5881

VWR Scientific
Newton Upper Falls, Mass.
617 / 969-0900

NORTH CENTRAL

Preiser Scientific
Charleston, W. Va.
304 / 343-5515

Preiser Scientific Inc.
Louisville, Ky.
502 / 636-3307

Riverside Chemical Co.
N. Tonawanda, N.Y.
716 / 692-1350

Sargent-Welch Scientific Co.
Cincinnati, Oh.
513 / 771-3850

Sargent-Welch Scientific Co.
Garfield Heights, Cleveland, Oh.
216 / 587-3300

Arthur H. Thomas Co.
Philadelphia, Pa.
215 / 574-4500

VWR Scientific
Columbus, Oh.
614 / 445-8281

VWR Scientific
Rochester, N.Y.
716 / 288-5881

Ashland Chemical Co.
Binghamton, N. Y.
607 / 723-5455

Curtin-Matheson Scientific Co.
Cincinnati, Oh.
513 / 671-1200

Curtin-Matheson Scientific Co.
Cleveland, Oh.
216 / 883-2424

MID-ATLANTIC

General Scientific
Richmond, Va.
804 / 264-2861

General Scientific
Vienna, Va.
703 / 938-3500

Macalaster Bicknell of N.J. Inc.
Millville, N.J.
609 / 825-3222

Ace Scientific Supply Co. Inc.
Linden, N.J.
201 / 925-3300

Beckman Instruments Inc.
Mountainside, N.J.
201 / 232-7600

Bellevue Surgical Supply Co.
Reading, Pa.
215 / 376-2991

Berg Chemical Co.
New York, N.Y.
212 / 563-2684

J. & H. Berge, Inc.
South Plainfield, N.J.
201 / 561-1234

Bowman-Mell Co., Inc.
Harrisburg, Pa.
717 / 238-5235

Curtin-Matheson Scientific Co.
Beltsville, Md.
301 / 937-5950

Curtin-Matheson Scientific Co.
Wayne, N.J.
201 / 278-3300

Dolbey Scientific
Philadelphia, Pa.
215 / 748-8600

John G. Merkel & Sons
Wilmington, De.
302 / 654-8818

Para Scientific Co.
Fairless Hills, Pa.
609 / 882-4545

Reading Scientific Co.
Reading, Pa.
215 / 921-0221

Sargent-Welch Scientific Co.
Springfield, N.J.
201 / 376-7050

SGA Scientific Inc.
Bloomfield, N.J.
212 / 267-9451
201 / 748-6600

Scientific Equipment Co.
Philadelphia, Pa.
215 / 222-5655

Seidler Chem. & Supply Co.
Newark, N.J.
201 / 622-4495

Arthur H. Thomas Company
Philadelphia, Pa.
215 / 574-4500

VWR Scientific
Baltimore, Md.
301 / 796-8500

SOUTHEAST

Nashville Surgical Supply Co.
Nashville, Tn.
615 / 255-4601

Preiser Scientific Inc.
Durham, N. C.
919 / 688-5583

Preiser Scientific Inc.
Louisville, Ky.
502 / 636-3307

Sargent-Welch Scientific Co.
Birmingham, Al.
205 / 251-5125

Arthur H. Thomas Company
Philadelphia, Pa.
215 / 574-4500

VWR Scientific
Atlanta, Ga.
404 / 351-3872

Curtin-Matheson Scientific Co.
Atlanta, Ga.
404 / 349-3710

Curtin-Matheson Scientific Co.
Miami, Fl.
305 / 552-8052

Curtin-Matheson Scientific Co.
Orlando, Fl.
305 / 859-8281

Carolina Biological Supply Co.
Burlington, N. C.
919 / 584-0381

Durr-Fillauer Surgical Supplies Inc.
Chattanooga, Tn.
615 / 267-1161

Estes Surgical Supply Co.
Atlanta, Ga.
404 / 521-1700

CENTRAL

Macmillan Science Co., Inc.
Chicago, Il.
312 / 488-4100

Physicians & Hosp. Supply Co.
Scientific & Laboratory Div.
Minneapolis, Mn.
612 / 333-5251

Rascher & Betzold, Inc.
Chicago, Il.
312 / 275-7300

Rupp & Bowman Company
Detroit, Mi.
313 / 491-7000

SGA Scientific Inc.
Elk Grove Village, Ill
312 / 439-2500

Sargent-Welch Scientific Co.
Detroit, Mi.
313 / 931-0337

Sargent-Welch Scientific Co.
Skokie, Il.
312 / 267-5300

Technical Industrial Products
East Peoria, Il.
309 / 694-6226

Wilkens-Anderson Co.
Chicago, Il.
312 / 384-4433

Hawkins Chemical Co.
Minneapolis, Mn.
612 / 331-6910

Melton Company, Inc.
Labco Scientific Div.
Oklahoma City, Ok.
405 / 235-3526

Lerlab Supply Co.
Hibbing, Mn.
218 / 262-3456

Curtin-Matheson Scientific Co.
Detroit, Mi.
313 / 964-0310

Curtin-Matheson Scientific Co.
Elk Grove Village, Il.
312 / 439-5880

Curtin-Matheson Scientific Co.
Kansas City, Mo.
816 / 561-8780

Curtin-Matheson Scientific Co.
Midland, Mi.
517 / 631-9500

Curtin-Matheson Scientific Co.
Minneapolis, Mn.
612 / 378-1110

Curtin-Matheson Scientific Co.
New Orleans, La.
504 / 524-0475

Curtin-Matheson Scientific Co.
St. Louis, Mo.
314 / 872-8100

A. Daigger & Co.
Chicago, Il.
312 / 644-9438

Drake Brothers
Menomonee Falls, Wi.
414 / 781-2166

Genetec Hospital Supply Co.
Div. of McKesson & Robbins
Milwaukee, Wi.
414 / 271-0468

General Medical of Indiana
Indianapolis, In.
317 / 634-8560

Lapine Scientific
Chicago, Il.
312 / 735-4700

SOUTH CENTRAL

Sargent-Welch Scientific Co.
Dallas, Tx.
214 / 357-9381

VWR Scientific
El Paso, Tx.
915 / 778-4225

VWR Scientific
Houston, Tx.
713 / 641-0681

Capitol Scientific
Austin, Tx.
512 / 836-1167

Curtin-Matheson Scientific Co.
Dallas, Tx.
214 / 747-2503

Curtin-Matheson Scientific Co.
Houston, Tx.
713 / 923-1661

Curtin-Matheson Scientific Co.
New Orleans, La.
504 / 524-0475

Curtin-Matheson Scientific Co.
Tulsa, Ok.
918 / 622-1700

SOUTHWEST

Sargent-Welch Scientific Co.
Denver, Co.
303 / 399-8220

VWR Scientific
Albuquerque, N. M.
505 / 842-8650

VWR Scientific
Denver, Co.
303 / 371-0970

VWR Scientific
Phoenix, Az.
602 / 272-3272

VWR Scientific
Salt Lake City, Ut.
801 / 486-4851

VWR Scientific
Tucson, Az.
602 / 624-8371

Curtin-Matheson Scientific Co.
Kansas City, Mo.
816 / 561-8780

FAR WEST

VWR Scientific
Brisbane, Ca.
415 / 469-0100

VWR Scientific
Los Angeles, Ca.
213 / 265-8123

VWR Scientific
San Diego, Ca.
714 / 262-0711

VWR Scientific
Portland, Or.
503 / 225-0400

VWR Scientific
Seattle, Wa.
206 / 447-5811

VWR Scientific
Honolulu, Hi.
808 / 847-1361

Curtin-Matheson Scientific Co.
Brisbane, Ca.
415 / 467-1040

Curtin-Matheson Scientific Co.
Fountain Valley, Ca.
714 / 963-6761

Curtin-Matheson Scientific Co.
Seattle, Wa.
206 / 575-0575

Labproducts
Tukwila, Wa.
206 / 575-0820

Northwest Scientific Co.
Billings, Mt.
406 / 252-3269

Sargent-Welch Scientific Co.
Anaheim, Ca.
714 / 772-3550

Powerful washing action
Gets glassware "squeaking clean" . . . 278 scouring water jets positioned above and below the rotating wash basket clean relentlessly.

Fresh, clean hot water
Instantly available for each wash. While one batch of glassware is being washed, Jet-Clean automatically preheats another batch of water to preset temperature and stores it for the next wash. No waiting ever.

Perpetually hot wash water
Jet-Clean's strong booster heater keeps water hot during entire wash cycle, boosts cleaning effectiveness.

Safety always
The wash chamber door slides up and out of your way . . . shuts off the washer when opened . . . turns it on again when closed.

Total automation and versatility
All yours with the Jet-Clean control panel. It's simple to use, yet provides an almost endless variety of wash programs. Set the exact wash program needed to suit the size, makeup, and dirtiness of your glassware. Program all wash cycles, water temperature, even the automatic detergent dispenser . . . in seconds.

Cool, quiet, steamless
Thanks to Jet-Clean's superior insulation and special baffle system.

Durable beauty
Stainless steel construction makes Jet-Clean good-looking and easy to clean.

Convenient Jet-Clean detergent
It's a ready-to-use liquid supplied in its own container. No messy mixing. Just slip it into the automatic dispensing module and forget it. The detergent itself is specially fortified to break down dirt fast . . . rinses off without streaking.

Large capacity wash baskets
Fill 'em up with 40% to 100% more glassware than other washer baskets. They hold the widest variety of glassware too — from beakers to volumetric flasks.

Audrey
She's not included with the washer but will be happy to send you detailed literature.
Write: Fisher Scientific Co.
711 Forbes Ave.,
Pittsburgh, Pa. 15219.

FISHER JET-CLEAN™
the finest laboratory glassware washer made



Circle No. 117 on Readers' Service Card

F-844-1

Make a Zeiss STANDARD your own STANDARD

It pays because of Zeiss Optics

For the optics alone it pays to buy Zeiss. They are without equal in quality and range. For example, the objectives for the Standard Microscope System are exactly the same as we use on our large, much more expensive research microscopes. And the System offers 131 different ones to choose from.

It pays because of the precision engineering

Every component in the Standard Microscope System is engineered and machined to such perfection that interchangeability is a snap. Everything is designed to fit and perform just as smoothly after years of use as it did on the first day—even under heavy daily laboratory work loads.

It pays because it's a whole system

We custom-tailor your Standard for your applications.

Shown below are just six of the most popular versions:

1. Standard 14 for students;
2. Standard 19 with Glarex viewing screen;
3. Standard 14 for phase contrast;
4. Standard 98 with zoom condenser and camera;
5. Standard 15 with rotating stage for Pol;
6. Standard 18 for fluorescence, with excitation in transmitted or incident light.

There are, of course, many other versions, including those for reflected light and Nomarski Interference Contrast.

Nationwide service.

Carl Zeiss, Inc., 444 5th Avenue, N.Y., N.Y. 10018 (212) 730-4400. Branches in: Atlanta, Boston, Chicago, Columbus, Houston, Los Angeles, San Francisco, Washington, D.C. In Canada: 45 Valleybrook Drive, Don Mills, Ont., M3B 2S6. Or call (416) 449-4660.

ZEISS
THE GREAT NAME IN OPTICS
CARL ZEISS
WEST GERMANY

Circle No. 385 on Readers' Service Card

REPIPET® reagent dispensers are the world's most versatile dispensers...they dispense from any manufacturer's container, no matter what size, no matter what reagent (except HF)...with guaranteed precision 0.1%.

L/I's extensive line of REPIPET® reagent dispensers now includes the following sizes: ½, 1, 2½, 5, 10, 20, 50, and 100 ml. Prices start at \$68.50 for glass

instruments; unbreakable plastic units available for under \$20. For free new catalog, phone, write or circle Reader Service Number.

LAB INDUSTRIES

1802 Second Street, Berkeley, CA 94710
Phone (415) 843-0220





Hotpack anticipates the researcher's needs with a complete line of CO₂ incubators

Mechanically-convected and water-jacketed CO₂ incubators. 5-50 cu ft capacities. Bench-top units with up to 74 sq ft of load area. Single, double and four-door floor models with up to 208 sq ft of load area. Temperature ranges down to 0°C and up to 60°C. Accurate Tempstat or solid state proportional control with $\pm 0.2^\circ\text{C}$ temperature uniformity.

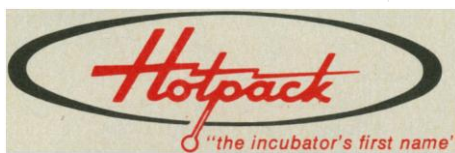
Standard direct set percent CO₂ tension 0 to 20%. Fast pushbutton CO₂ recovery. Built-in air supply. Automatic safety thermostat. Elevated

RH to 98%. 5,6,10,12,24 and 50 cu ft capacities. Most models available with built-in self-decontamination.

Hotpack options include: *Digital set and readout* solid state proportional temperature control with 0.1°C resolution; *Analytical CO₂ control/monitor* with digital readout and $\pm 0.1\%$ tension stability; *Direct-dial* solid state RH control system with effective range of 70% to 98% RH.

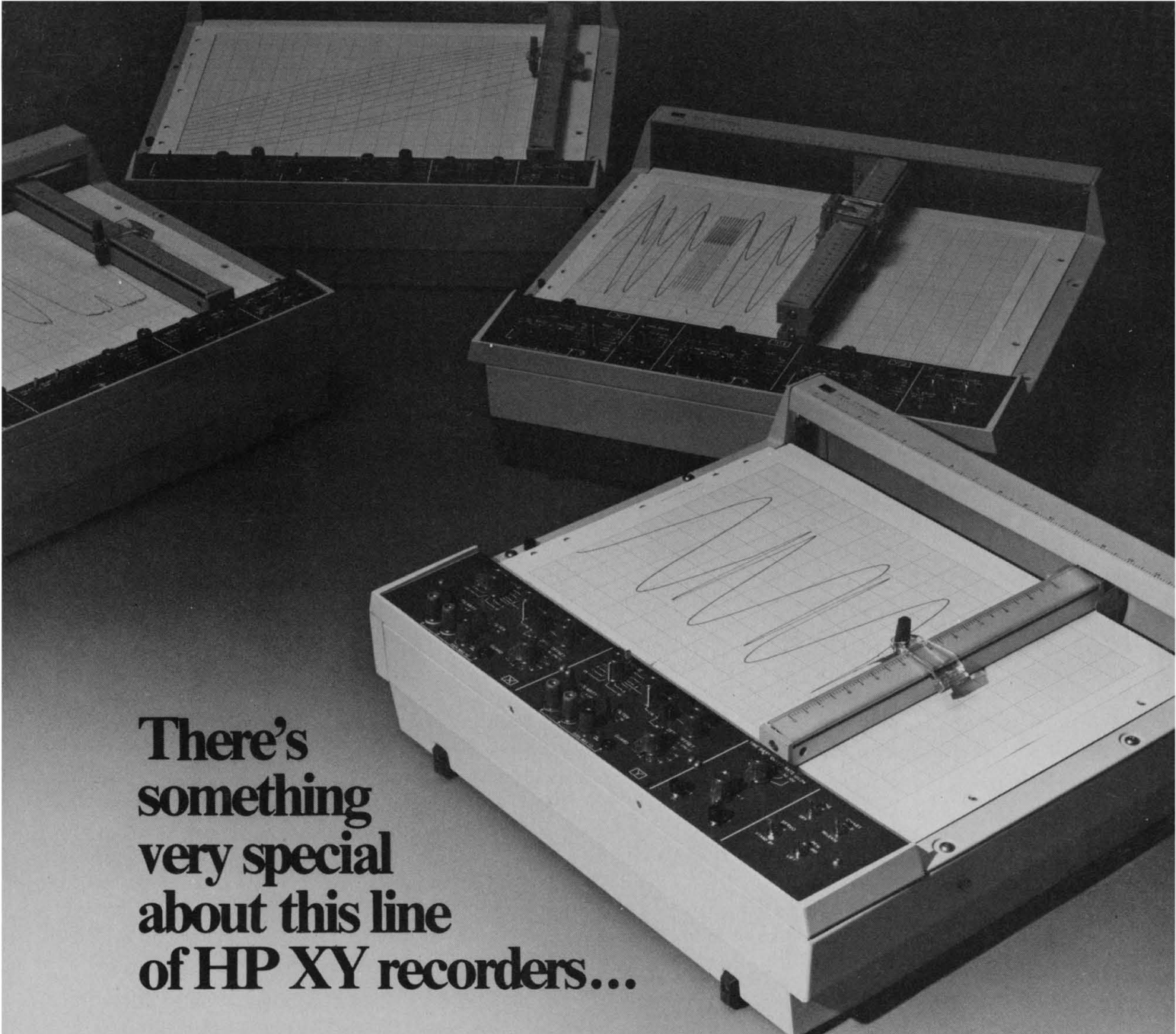
Always the right model for your application . . . including a full line of walk-in incubators.

EXPLORE THE FULL LINE OF HOTPACK CO₂ INCUBATORS. SEND FOR COMPLETE CATALOG TODAY!



HOTPACK CORPORATION

COTTMAN AVENUE AT MELROSE ST., PHILADELPHIA, PENNSYLVANIA 19135 (215) 333-1700 - 800-523-3608
IN CANADA: HOTPACK (CANADA) LTD., WATERLOO, ONT. (519-884-3590)



**There's
something
very special
about this line
of HP XY recorders...**

**the newest addition
is the fastest most sensitive machine
we've ever built.**

HP's line of XY recorders is designed to let you choose the right machine with the right options to do the right kind of job for your lab. First: a basic one-pen workhorse. Then, a fast high-performance version. And a two-pen model that doesn't sacrifice speed.

Now, HP introduces a very special combination of acceleration and sensitivity: The Model 7047A.

This is an outstanding XY recorder, the top of the line. Sensitivity of $50 \mu\text{V/in.}$

Acceleration in the Y axis of 3000 in/sec^2 and 2000 in/sec^2 in the X axis. With fully guarded input and 130db common mode rejection.

To meet the demands of the most exacting lab work, the 7047A gives you a switchable input filter, 11 scales of calibrated offset, internal time base and TTL remote control. All as standard equipment.

And like all recorders in the line, the 7047A is built on a strong die-cast aluminum mainframe. Inside, there are no

complicated slip clutches, just tough, continuous duty servo motors that can be driven offscale independently without damage.

This is the best of the best XY recorders ever offered by Hewlett-Packard. Prices start at \$2,850 (domestic USA price only). For complete details on the new 7047A and the other recorders in the HP line, see your HP field representative or write Hewlett-Packard, 1501 Page Mill Road, Palo Alto, California 94304.

11408

HEWLETT  PACKARD

Sales and service from 172 offices in 65 countries.
1501 Page Mill Road, Palo Alto, California 94304

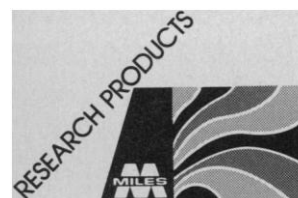
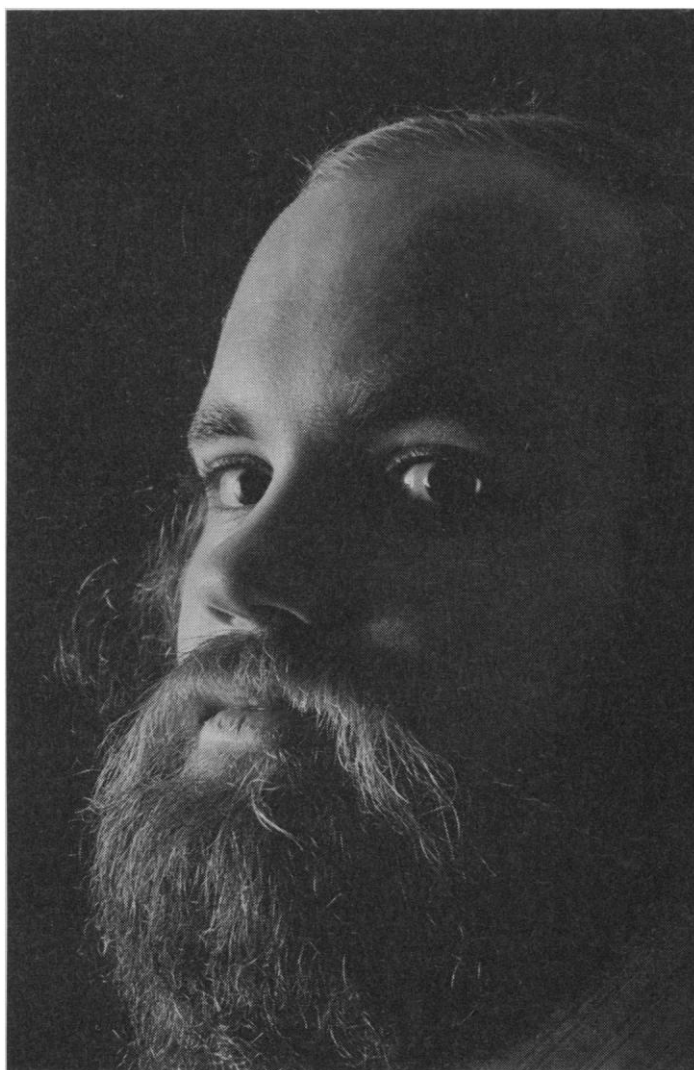
Circle No. 234 on Readers' Service Card

MEET YOUR MAKER.

We may not be able to tell you the meaning of life, but we can tell you all you want to know about the lives of every biochemical that comes from Miles Research Products; because we made them. For example, if our enzyme is losing activity in your lab, we can give you the advice and assistance you need to keep it alive and well and working for you.

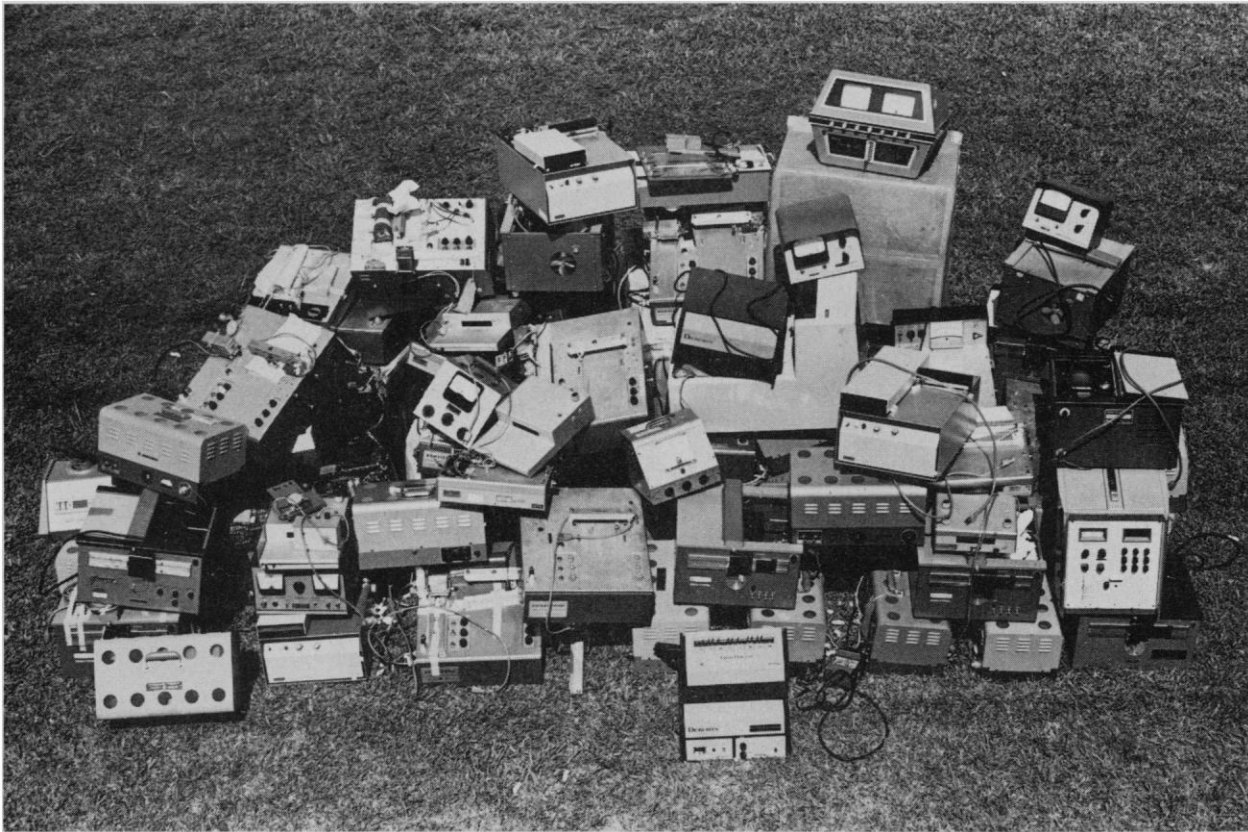
Or, if you're having trouble locating cleavage sites with our restriction nucleases, we can help you find them.

We can't do your experiment for you, but we can tell you what you want to know about our biochemicals. Our number is 219-264-8946. There is a human being on the other end who wants to help you. Call him and be saved.



Research Products
Miles Laboratories, Inc.
Elkhart, Indiana 46514
Phone: 219-264-8804

TECHNICAL SERVICE
THAT PUTS YOU
MILES AHEAD.



Helena has allowed generous trade-ins for 57 scanners, we want your old unit too!!

How good is a Helena Scanner?

Good enough for

Millipore Beckman Photovolt
Clifford Gelman Canalco

users to trade in their units for a Helena Scanner



FOR A DEMONSTRATION
OR MORE INFORMATION

**helena
laboratories**

1530 lindbergh drive / p.o. box 752
beaumont, texas 77704
toll free 800-231-5663
in texas, collect 713-842-3714
telex no. twx 910-884-5171

Electrophoresis

Immunology

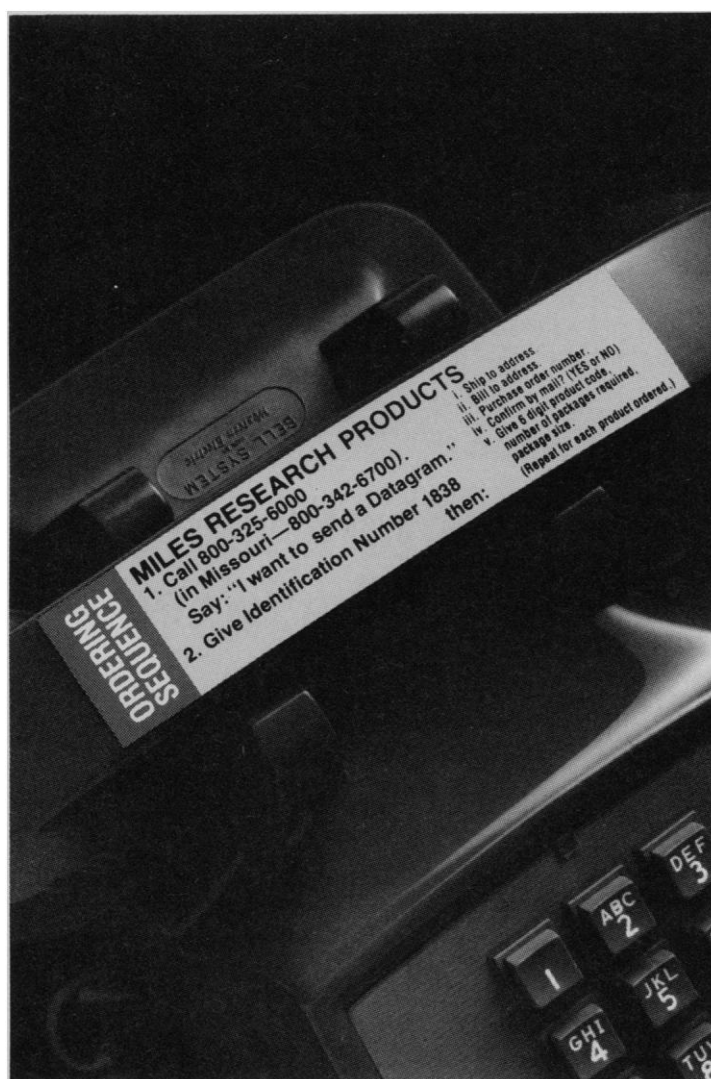
Enzymology

Circle No. 371 on Readers' Service Card

HAVE YOU MISSED YOUR CALLING?

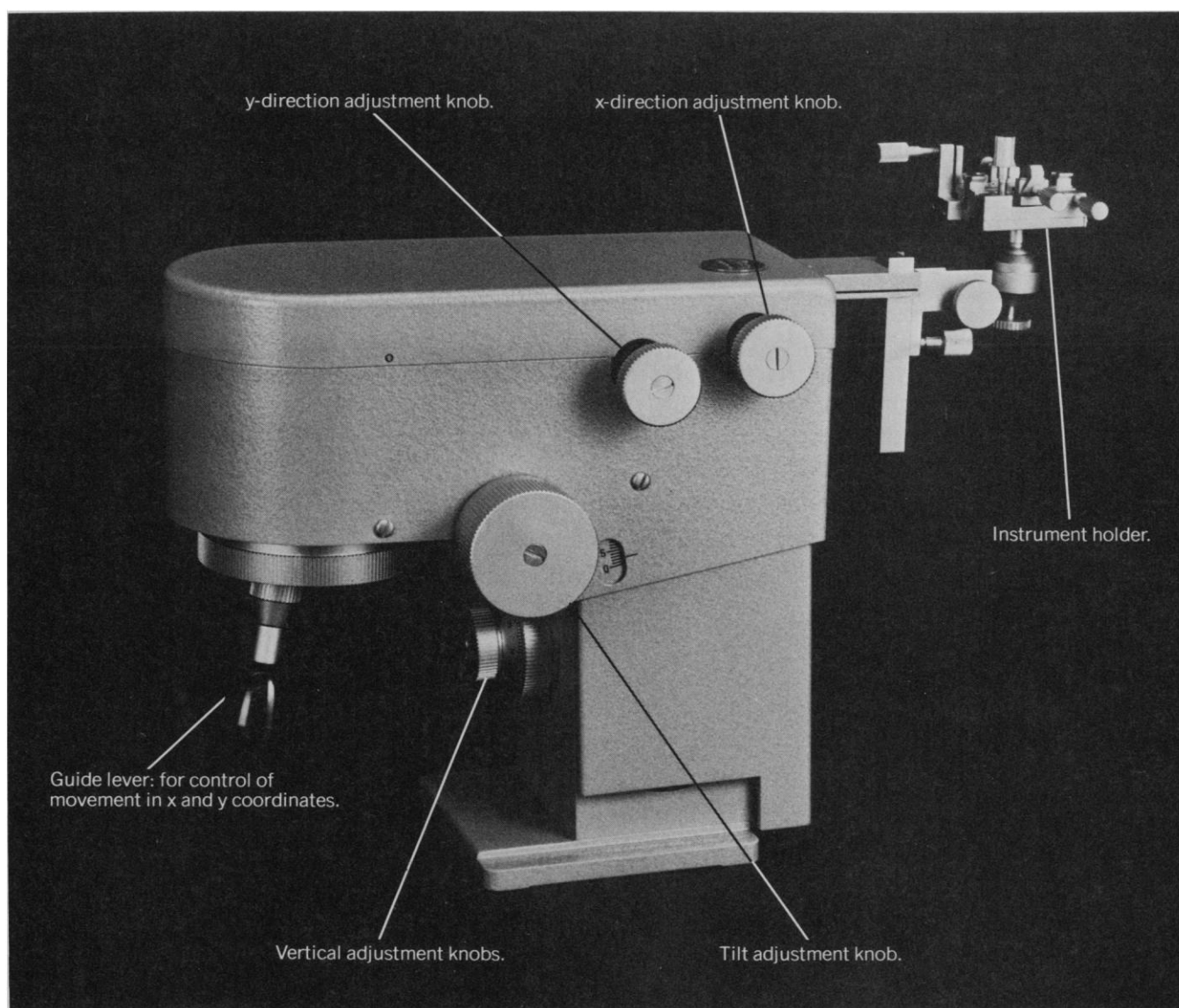
So you're relaxing at home on Saturday, and you suddenly remember you forgot to order the antisera you'll be needing in the lab next week. Don't worry. Miles Research Products has 24-hour-a-day, 7-day-a-week ordering service. Just

call 800-325-6000 toll free and send a Datagram from anywhere in the United States. Your order will be shipped bright and early the next working day. The next time you miss your calling, dial Miles. We'll give you another chance.



Research Products
Miles Laboratories, Inc.
Elkhart, Indiana 46514
Phone: 219-264-8804

SERVICE
THAT PUTS YOU
MILES AHEAD.



Our micromanipulator: It's positively Machiavellian.

Smooth, subtle, cunningly designed, this Leitz instrument lets you manipulate with exactness, skill, delicacy.

You can operate on the most minute specimens at highest magnifications. Because it is a mechanical, rather than pneumatic or hydraulic device, the Leitz instrument is precise, trouble-free, and has no drift.

The unique lever and sliding bar design eliminate hand vibrations, settling of instrument tips and backlash. Movements of the guide lever are immediately reproduced as instrument movements.

The guide lever actuates fine movements in the x and y coordinates. The ratio of hand-to-instrument movement is continuously variable from 1:1/16 to 1:1/800.

Precise inclinations of instruments through 15 degrees may also be made. Moreover, gross adjustments of instrument position in all three coordinates may be made with the instrument holder itself. The micro-instruments can be interchanged quickly.

The micromanipulator reaches every point within the microscopical field of view instantly and precisely even under the highest magnification. The instrument is ruggedly built to eliminate vibrations so that you can perform exact and reliable micro-operations.

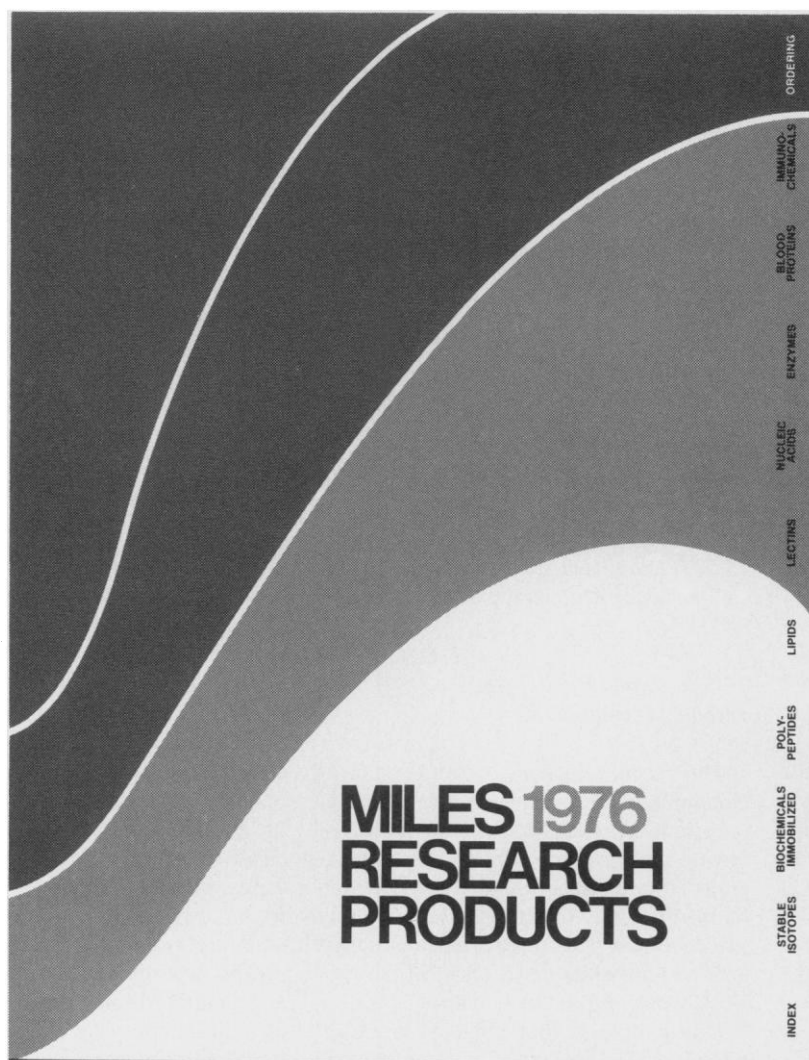
For information call 201-767-1100 or write E. Leitz, Inc., Rockleigh, N.J. 07647. Or: Wild Leitz Canada, Ltd., 881 Lady Ellen Place, Ottawa K1Y4G1.

Leitz[®]

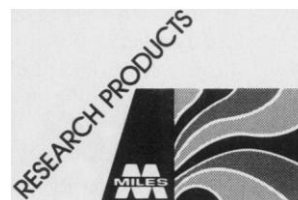
THE INFLATION YOU'LL BE GLAD ABOUT.

So you're unhappy about the way everything is going up these days? Well, here's a rising sign you'll like hearing about. In the past year, there's been an increase in the number of biochemical products you can get from Miles. Not just old familiar products, but exciting new ones like: L-Fucose dehydrogenase, Reagents for the detection of ANA antibodies, *Hae* Restriction nucleases,

Polyacrylic hydrazide agarose. In fact, we have so many new products, we had to make a new catalog to put them all in. It's literally bulging with our complete line of biochemicals, old and new. And each product listing is followed by a referenced summary of how it was made and assayed. One of these books is waiting now for your request. Send for it now, before inflation forces us to print our next catalog.



Circle No. 282 on Readers' Service Card



Research Products
Miles Laboratories, Inc.
Elkhart, Indiana 46514
Phone: 219-264-8804

PRODUCTS
THAT PUT YOU
MILES AHEAD.

Liquid Scintillation Counting: A Commitment

As the leading manufacturer of radiochemicals, NEN has come to know a good deal about the problems you face in liquid scintillation counting. So much so that in the last ten years we have developed the industry's most complete line of liquid scintillation chemicals, with over 30 products stocked worldwide. They include our AQUASOL® Cocktails — the world's most referenced scintillators, and BIOFLUOR™ — the highest efficiency product for aqueous tritium counting.

Our commitment goes beyond making products. We provide

worldwide LSC technical expertise through field representatives trained to assist you in the selection of scintillation chemicals tailored to your needs. And they're supported by the industry's only LSC Applications Laboratory. Write for complete information.

NEN New England Nuclear

549 Albany Street, Boston, Massachusetts 02118
Customer Service 617-482-9595

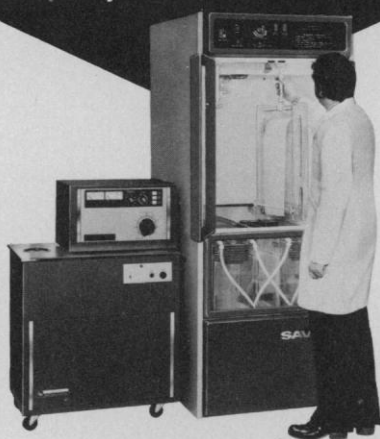
Canada: NEN Canada Ltd., Lachine, Quebec, H7T 3C9,

Tel: 514-636-4971, Telex: 05-821808

Europe: NEN Chemicals GmbH, D-6072 Dreieichenhain,
W. Germany, Daimlerstrasse 26, Postfach 1240. Tel: (06103) 85034.

Circle No. 422 on Readers' Service Card

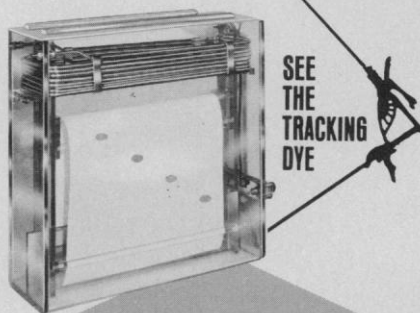
The world's most complete High Voltage Electrophoresis System ...and it's SAFE, TOO!



SAVANT'S HIGH VOLTAGE ELECTROPHORESIS ENCLOSURE WITH TWO LUCITE TANKS.

**A fully integrated ELECTRICAL and
FIRE PROTECTED chamber.**

- ☐ Fire Detection and CO₂ Extinguishing System.
- ☐ Audible Alarm and Remote Alert Signal.
- ☐ Electrical Interlocks for Primary and High Voltage Protection.
- ☐ Ground Fault Detection and Circuit Interruption.
- ☐ Flow-Thru Ventilation for Vapor Disposal.
- ☐ Cooling Water Flow Monitor and Visual Indicator.
- ☐ Unobstructed Visibility.
- ☐ Dimensions: 36" Wide x 39" Deep x 80" High.



SEE
THE
TRACKING
DYE

Savant HVE Systems are "PROVEN"
in over one thousand laboratories
around the world. Request cat. #8036.

**Savant
Instruments, Inc.**
221 Park Avenue Hicksville, N.Y. 11801
(516) 935-8774

Circle No. 197 on Readers' Service Card

center are successfully coping with the variety of problems which are bound to develop in such a large pioneering project. In terms of the basic scientific value, scientific excellence, ethics, community and scientists' cooperation, administration, and fiscal prudence, MRFIT is maintaining successful progress toward its objectives.*

JOHN C. CASSEL

*Department of Epidemiology, School of
Public Health, University of
North Carolina, Chapel Hill 27515*

WILLIAM INSULL, JR.

*Center for Prevention of Premature
Arteriosclerosis, Rockefeller University,
New York 10021*

DAVID JENKINS

*Department of Behavioral Epidemiology,
School of Medicine, Boston University,
Boston 02118*

DONOVAN THOMPSON

*Department of Biostatistics,
School of Public Health,
University of Washington, Seattle 98105*

PARK W. WILLIS, III

*Section of Cardiology, School of
Medicine, University of Michigan,
Ann Arbor 48104*

CHARLOTTE M. YOUNG

*Cornell University, Ithaca,
New York 14850*

*The undersigned are nonfederal scientists who comprise the MRFIT Policy Advisory Board.

Health Statistics

Horacio Fabrega's article, "The need for an ethnomedical science" (19 Sept. 1975, p. 969) and the comments by Bergner *et al.* (Letters, 9 Jan., p. 26) were indeed timely. This year's AAAS annual meeting included a symposium, Health Status Indexes—Their Role in Tomorrow, which addressed the same issues. Information was presented about the current applications of health indicators, such as morbidity and mortality, within the social indicator framework. Discussion focused on the methodology of measuring positive aspects of health, with implications for developing health indexes for policy purposes.

Measures of health are now becoming sufficiently developed to assist in the decision-making process. Various research efforts during the last 50 years have produced significant literature published in a variety of respected professional journals on the development of measurable concepts of health and disease. Much of this research has been supported by the U.S. federal health establishment, as well as by the United Nations and the World Health Organization.

To coordinate the dissemination of this information and to encourage communication and cooperation among health status researchers, the National Center for Health Statistics, Department of Health, Education, and Welfare, has established the Clearinghouse on Health Indexes. The Clearinghouse prepares annotated bibliographies of current information related to health measurement and generates bibliographies on specific subjects. These services are available without charge.

PENNIFER ERICKSON

*Division of Analysis,
Clearinghouse on Health Indexes,
National Center for Health Statistics,
Rockville, Maryland 20852*

Climate Research

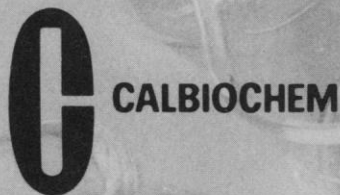
Among the host of warnings of environmental degradation now facing the public is the claim that disaster is in store if mankind fails to realize that his well-being depends on a stable global climate and that climatic change, either natural or man-made, is a real threat which must be attended to today.

As is true in the case of many environmental advocacy causes, some claims are gross exaggerations, thereby lending less credibility to the remainder. In addition, due in large measure to the degree of ignorance regarding the fundamentals of the nature of climatic variability and change, disagreements among climate experts concerning the plausibility of possible traumatic effects of climatic change have caused confusion on the part of the lay-public and within government circles, making it difficult to assess the true state of affairs.


However, these circumstances are hardly sufficient to account for the lack of federal funding of climate research in response, not just to the clamor of the doomsday prophets, but also to a series of highly authoritative and respectable reports (1), all of which have reiterated the need for a major increase in climate research activities. No doubt the demise last spring of the National Climate Program (2) can in part be ascribed to the nation's economic difficulties, but there is another more trenchant cause for the problem, specifically a failure to demonstrate to funders of such research the practical benefits that can result within a time frame of relevance to their mandate. For example, at its most ambitious, climate research would generate untold benefits if it could lead to a predictive capability; at present, however, this is more a hope than an expectation. Research funding with such an objective would be long-term, high-risk, and have a

An uncluttered description of more than 2000 authentic research biochemicals

The publication in your hand contains current technical information of vital importance to your professional research. So does the Calbiochem catalog. Our editors strive to be informative, entertaining and brief in their uncluttered description of more than 2000 authentic research biochemicals. Calbiochem's publications and products are available from 9 offices and 50 local agents throughout the world. If you want a free subscription to our publications, send your name and professional address to Ms. H. Gone, c/o Calbiochem, P.O. Box 12087, San Diego, California 92112. Ask for our current catalog.



Circle No. 256 on Readers' Service Card

BAUSCH & LOMB 

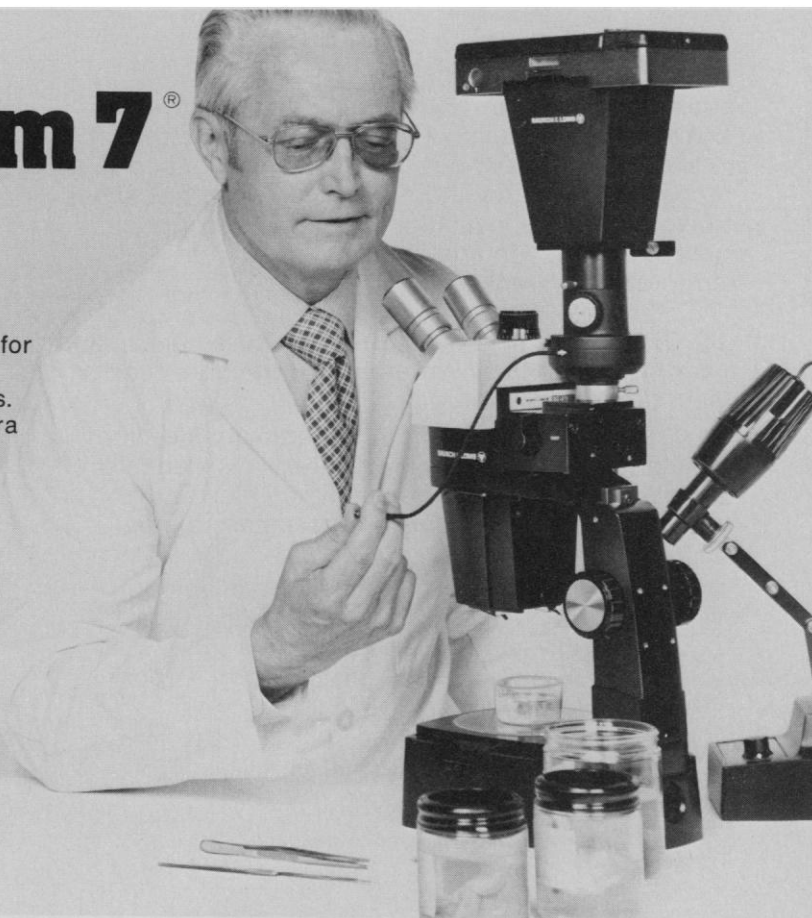
StereoZoom 7[®] microscope

...offers the largest selection of accessories to meet your individual needs.

Here's all the accessories... you asked for including 3 different eyepieces, 5 supplementary lenses, 8 stands and 6 illuminators. In addition, there are three separate camera formats and you can choose from a large array of photomicrographic "extras" for that *professional touch*... that's 25 accessories in all!

All this, plus high resolution (at least 300 lines/mm at 70X) and optimum lens design for crisp, flat field viewing over the entire range. Zooming is fast and continuously in focus from 1X to 7X while maintaining a constant working distance.

Find out more about the Bausch & Lomb StereoZoom 7. Write for free catalog and demonstration.



Bausch & Lomb, Scientific Optical Products Division, 20803 North Goodman Street, Rochester, N.Y. 14602

Circle No. 290 on Readers' Service Card

Isn't Your Work Too Important ... For Anything But The Best?



Product safety is our prime consideration. When Forma Scientific builds a biological storage freezer, we start with a heavy-duty steel cabinet bonded to an embossed aluminum liner with a minimum 5" foamed-in-place urethane insulation. With this superior quality construction and high-performance refrigeration system our cabinet temperatures of -75°C and -90°C are guaranteed in a very warm $+85^{\circ}\text{F}$ ambient. And overall temperature control and uniformity is the best. *No other manufacturer can match that guarantee!*

The dependable safety alarm system with life-time self-charging nickel cadmium batteries is standard. Forma's easily interchangeable liquid CO_2 and LN_2 automatic back-up systems are designed to meet OSHA requirements.

Forma Biological Storage Freezers. Available in low-profile 12 and 20 cu. ft. chest and space-saving 13 cu. ft. upright models. Temperatures to -75°C and -90°C . From Forma . . . the Freezer People.



Forma Scientific

BOX 649 • MARIETTA, OHIO 45750 • AREA CODE 614/373-4763
TELEX 24-5394 • TOLL FREE IN-WATS SERVICE 800-848-9730 AREAS 1, 2 & 3

Circle No. 14 on Readers' Service Card

high payoff. A conservative program would emphasize the collection and analysis of more data on climate the world over. Such knowledge would be of interest to planners in climate-sensitive sectors of the economy, for example, in determining the magnitude of buffer stocks of food. This type of research is easy to justify in terms of short-term goals but has attracted little attention from the research community, presumably because of its relatively mundane scientific content. Finally, there remains the very real possibility of an eventual man-made disturbance of the world's climate through any one of a variety of mechanisms, most of which were reviewed in the Study of Man's Impact on Climate report (3). The Climatic Impact Assessment Program (4), based on one such possibility, was in fact funded but ended without gaining the advances needed to predict the climatic consequences of a reduced ozone layer—its stated objective. Other man-induced impacts have been judged potentially serious, but far off, and thus those investigating them have not been able to compete for restricted research funds.

Within the last few months, new information has come to light: there is now a demonstrable case of a man-made global climatic change whose magnitude depends on planning decisions made today but which cannot be quantitatively assessed because of our ignorance of the dynamics of the climate system. The increase in global atmospheric carbon dioxide since the start of this century is well documented and the first-order climatic response well known (the "greenhouse" effect). Best estimates suggest an increase in global mean temperature of perhaps 2°C , with a doubling of ambient CO_2 levels above their preindustrial value (5), but reliable estimates are far from possible at present, due, not only to a lack of understanding of atmospheric dynamics, but to a wide variety of feedback mechanisms within the climate system that need to be investigated and taken into account. The latter, it should be pointed out, can result in diminution or enhancement of the climatic response (6). Projections have also been made of expected levels of atmospheric CO_2 by extrapolation of present-day trends of industrial generation. The recent report by Broecker (7) estimates a 50 percent increase by the year 2020, a figure that agrees with that used by Häfele and Sassin in an important new study (8) made for the International Institute for Applied Systems Analysis (IIASA). They assume a fully fossil-fuel energy production system for the world well into the next century (that is, insignificant nuclear or other forms of energy production) and report a date of 2035 for a doubling of the ambient CO_2 level. They also assume a 3 percent

energy growth rate for the world with an ultimate leveling off at 5 kilowatts per capita using 1974 U.N. population projection figures. The crucial new consideration introduced in the IIASA study is the juxtaposition of this fact with an assessment of our ability to massively deploy a new energy production technology. It points out that the "market penetration time" (that is, the time for a new energy production system to gain a 50 percent share of the total market, starting from a 1 percent level) is 60 years in the case of the United States and longer for the rest of the world. Moreover, this number appears to be an indigenous property of the economic forces that drive the market system and is difficult, if not impossible, to reduce materially. Thus, it so happens that the market penetration time just matches our current best estimate of the CO₂ doubling time, and if planning decisions for avoidance of possible CO₂ climatic impacts are to be effective, the time to make them appears to be now.

If the nation's energy planners take their public charge seriously, it is evident from these fundamental considerations that they should be pressing for assured predictions of the climatic consequences of their decisions on energy production deployment, as error could be disastrous. Understanding climatic change is a truly massive task; social responsibility dictates that we get on with the job diligently and expeditiously.

J. A. LAURMANN

3372 Martin Road,
Carmel, California 93921

References and Notes

1. Federal Council for Science and Technology, Interdepartmental Committee for Atmospheric Sciences, *Report of the Ad Hoc Panel on the Present Interglacial* (Government Printing Office, Washington, D.C., 1974); National Advisory Committee on Oceans and Atmosphere, *Third Annual Report* (Government Printing Office, Washington, D.C., 1974); U.S. Committee for the Global Atmospheric Research Program, *Understanding Climatic Change: A Program for Action* (National Academy of Sciences, Washington, D.C., 1974); Ocean Science Committee, *The Role of the Ocean in Predicting Climate* (National Academy of Sciences, Washington, D.C., 1975).
2. Environmental Resources Committee, Subcommittee on Climate Change, *A United States Climate Program* (Domestic Council, Washington, D.C., 1974).
3. *Inadvertent Climate Modification: Report of the Study of Man's Impact on Climate* (MIT Press, Cambridge, Mass., 1971).
4. A. J. Grobecker, S. C. Coroniti, R. H. Cannon, Jr., *The Effects of Stratospheric Pollution by Aircraft. Report of Findings* (National Technical Information Service, Springfield, Va., 1974).
5. S. H. Schneider and R. D. Dennett, *Ambio* 4, 65 (1975).
6. There are, of course, other possible man-made as well as natural causes of climatic change. Particulates from industrialization have until recently been thought to reduce global temperature. This is no longer believed to be necessarily the case [see S. H. Schneider and C. Mass, *Science* 190, 741 (1975)].
7. W. S. Broecker, *ibid.* 189, 460 (1975). Broecker also makes estimates of global temperature response allowing for projected natural climate change, an important consideration in predicting increased global temperatures.
8. W. Häfele and W. Sassin, "Energy strategies", paper presented at the European Physical Society Annual Meeting, Bucharest, 1975.

clean living

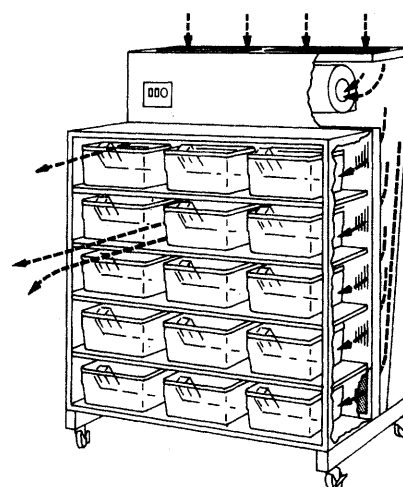


Laminar air flow is a technique which significantly reduces concentrations of airborne contamination in your animal breeding or research area.

Our laminar system, called **stay-clean**®, filters air at the source, and the velocity of the air—directed outward over the cages—carries away enclosure generated airborne contamination and also prevents entry of other contaminants.

Air flow from the **stay-clean** system is filtered to remove particles of 0.3 microns or larger. Air velocity is adjustable from 50 ft. per minute to 90 ft. per minute.

The **stay-clean** system is completely self-contained, easy to operate and requires little or no maintenance. The roll-around system is constructed of Type 316 stainless steel and is equipped with adjustable shelves so that a variety of cage sizes can be accommodated.



For complete details, prices and delivery, please write or call, Lab Products, Inc., 635 Midland Avenue, Garfield, New Jersey 07026. Phone (201) 478-2535.

lab products inc
a BioMedic company

The Gilson Micro-Fractionator:

Compact quality you
can carry with one hand—
and it doesn't cost you
an arm and a leg.

MODEL FC-80 FOR LIQUID CHROMATOGRAPHY

—drop counting or time-
actuated fraction collector.
Single-unit collector, with
base, drop detector, timer and
electronic digital counter.
Includes two test tube racks.
Holds 80 glass test tubes—
13 x 100 mm (9 ml). Size: 29 x
15 cm (11½ x 6 in.)

If you need to collect in larger
test tubes, the Model FC-100
holds 100 test tubes,
18 x 150 mm.

MODEL FC-80
*An electronic digital
counter indicates elapsed
number of drops or
elapsed time per tube*



Write or phone
U.S.A. MANUFACTURING PLANT:
GILSON MEDICAL ELECTRONICS, INC.
P.O. BOX 27, MIDDLETON, WIS. 53562
Telephone 608/836-1551 • TELEX 26-5478



EUROPEAN MANUFACTURING PLANT:
GILSON MEDICAL ELECTRONICS (FRANCE) S.A.
69, 72 rue Gambetta
VILLIERS-LE-BEL 95400 • ARNOUVILLE-LES-GONESSE, FRANCE
Telephone 990 54-41

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

1976

ALFRED E. BROWN	FRANK PRESS
JAMES F. CROW	FRANK W. PUTNAM
HANS LANDSBERG	MAXINE SINGER
EDWARD NEY	ARTHUR M. SQUIRES

1977

WARD GOODENOUGH	DONALD KENNEDY
CLIFFORD GROBSTEIN	NEAL E. MILLER
H. S. GUTOWSKY	RAYMOND H. THOMPSON
N. BRUCE HANNAY	

Editorial Staff

Editor

PHILIP H. ABELSON

Publisher

WILLIAM D. CAREY

Business Manager

HANS NUSSBAUM

Managing Editor: ROBERT V. ORMES

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

Assistant to the Editors: RICHARD SEMIKLOSE

News and Comment: JOHN WALSH, *Editor:* PHILIP M. BOFFEY, LUTHER J. CARTER, BARBARA J. CULLITON, ROBERT GILLETTE (on sabbatical), CONSTANCE HOLDEN, DEBORAH SHAPLEY, NICHOLAS WADE. *Editorial Assistant:* SCHERRAINE MACK

Research News: ALLEN L. HAMMOND, WILLIAM D. METZ, THOMAS H. MAUGH II, JEAN L. MARX, ARTHUR L. ROBINSON, GINA BARI KOLATA, FANNIE GROOM

Book Reviews: KATHERINE LIVINGSTON, LYNN MANFIELD, JANET KEGG

Cover Editor: GRAYCE FINGER

Editorial Assistants: JOHN BAKER, ISABELLA BOULDIN, MARGARET BURESCH, ELEANORE BUTZ, MARY DORFMAN, SYLVIA EBERHART, JUDITH GIVELBER, CAITILIN GORDON, CORRINE HARRIS, NANCY HARTNAGEL, OLIVER HEATWOLE, CHRISTINE KARLIK, MARGARET LLOYD, JEAN ROCKWOOD, LEAH RYAN, LOIS SCHMITT, YA LI SWIGART, ELEANOR WARNER, ROBERTA WEDGE

Guide to Scientific Instruments: RICHARD SOMMER

Membership Recruitment: GWENDOLYN HUDDLE; *Subscription Records and Member Records:* ANN RAGLAND

Advertising Staff

Director

EARL J. SCHERAGO

Production Manager

MARGARET STERLING

Advertising Sales Manager: RICHARD L. CHARLES

Sales: NEW YORK, N.Y. 10036: Herbert L. Burkland, 11 W. 42 St. (212-PE-6-1858); SCOTCH PLAINS, N.J. 07076: C. Richard Callis, 12 Unami Lane (201-889-4873); CHICAGO, ILL. 60611: Jack Ryan, Room 2107, 919 N. Michigan Ave. (312-DE-7-4973); BEVERLY HILLS, CALIF. 90211: Winn Nance, 11 N. La Cienega Blvd. (213-657-2772); DORSET, VT. 05251: Fred W. Dieffenbach, Kent Hill Rd. (802-867-5581)

EDITORIAL CORRESPONDENCE: 1515 Massachusetts Ave., NW, Washington, D.C. 20005. Phones: (Area code 202) Central Office: 467-4350; Book Reviews: 467-4367; Business Office: 467-4411; Circulation: 467-4417; Guide to Scientific Instruments: 467-4480; News and Comment: 467-4430; Reprints and Permissions: 467-4483; Research News: 467-4321; Reviewing: 467-4443. Cable: Advancesci, Washington. Copies of "Instructions for Contributors" can be obtained from the editorial office. See also page xi, *Science*, 26 September 1975. ADVERTISING CORRESPONDENCE: Room 1740, 11 W. 42 St., New York, N.Y. 10036. Phone: 212-PE-6-1858.

Synthetic Rubber in World War II

It is ironic that in the bicentennial year of our Declaration of *Independence*, one of the major national issues is concern about our *dependence* on foreign nations for some of our vital resources. However, the idea of a foreign cartel setting the world price for a crucial world commodity is not new. Southeast Asia is particularly well suited to the growth of rubber trees on plantations. This fact made that part of the world even more important to the rubber industry than the Persian Gulf is to today's oil industry, and the owners of the rubber plantations were not slow to take advantage of that.

In 1922, Great Britain felt secure enough in its command of the rubber supply to set in motion a cartel program called the Stevenson Plan. They succeeded in quadrupling the price of raw rubber within 4 years. Incidentally, the "Sheik Yamani" of the Stevenson Plan was Britain's Foreign Secretary, a rising young politician named Winston Churchill. In 1934, the Dutch joined the British in a second rubber cartel. Between them, they were able to control prices and dominate world markets. This situation persisted right up until the beginning of World War II. Indeed, only tentative steps were taken to alleviate our dependence during the first 6 months *after* Pearl Harbor.

In short, it certainly was not due to the foresight of the American people or their leaders that we managed to pull off the amazing feat of going from complete dependence on foreign rubber supplies to virtually complete rubber independence in three short years. How did we manage it?

There were two unusually lucky circumstances. First, some imaginative people had been attracted to the emerging field of polymer science in spite of the rather dim prospect of anything forthcoming that would be practical on a large scale. Second, the Germans had had the lack of foresight to export to the United States a lot of technological know-how in the chemical field. However, the synthetic rubber program involved much more than luck. At least one aspect of the program carries a lesson which is applicable today.

America's "rubber crisis" of 1942 underlined an important point about technology and human nature. That is, it is easier to meet a problem through the large-scale use of technology than to get people to make a major change in their style of living. Let me explain how the rubber program illustrates this.

After Malaya and Indonesia fell to the Japanese in 1942, the reality of the nation's rubber shortage began to dawn on our national policy-makers. Two obvious courses of action presented themselves. One was to step up the effort to find a "technological fix"—that is, to greatly accelerate the synthetic rubber program. The other was the idea of "resource conservation"—that is, to drastically curb civilian uses of rubber and collect scrap rubber to meet our needs.

At first, the idea of conservation got the main attention. The papers were filled with the exploits of people like Abner Peel of Rahway, New Jersey, who figured out a way of patching and recycling ladies' girdles.

But conservation was a disappointment. Much less scrap rubber was collected than had been expected, and problems of storage and transportation prevented even that from being used. The problem was not lack of patriotism or public willingness. Rather, it was the simple impossibility of totally turning around the ingrained habits of a society in a short time.

Fortunately, the technological fix solution was a bit more successful. Indeed, the success of the synthetic rubber program was fantastic by any standard. In 1940 not a single pound of general-purpose synthetic rubber was produced in the United States. By 1944, the annual production was over 670,000 tons.

What can this story teach us? The synthetic rubber program showed that a joint university-government-industry effort *can* be an effective method of meeting a national need that is just too big and too risky to ask a single industrial firm to undertake. The program also showed that we should not let important efforts be impeded by artificial distinctions between "pure" and "applied" research. Planning, research, and development are all necessary components of a total technical effort.—ARTHUR M. BUECHE, *Vice President for Research and Development, General Electric Research and Development Center, Schenectady, New York 12301*

This editorial is excerpted from a convocation address delivered on 26 September 1975 at the dedication of George Stafford Whitby Hall, University of Akron, Akron, Ohio.

Choose
Oxford® DIFFU-GEN™ Systems
for your immunology needs.



Benefit two ways.

1. Unexcelled quality and flexibility.

- Complete line of regular and low level plates for single radial immunodiffusion. "Measured time" or maximal diffusion. Lot-specific, pre-calibrated reference tables with all plates.
- Antisera for all techniques.

2. Individual attention.

- Call or write Dr. Richard Davis today, to order or to answer your specific questions.

800-227-0276 toll-free.

From California and Canada,
call (415) 573-1343 collect.

Authorized Oxford® DIFFU-GEN distributors:

Scientific Products
Fisher Scientific Company
Curtin Matheson Scientific, Inc.

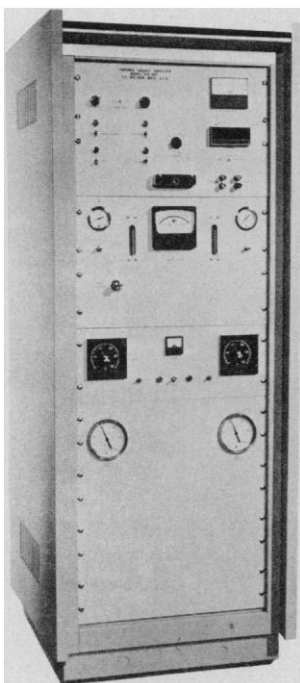
In Canada:

Canadian Laboratory Supply, Ltd.
Fisher Scientific Company, Ltd.

OXFORD
LABORATORIES

Subsidiary of G. D. Searle & Co.
Foster City, California 94404
Circle No. 347 on Readers' Service Card

Highly Specific
and
Sensitive Measurement of
**N-NITROSAMINES
AND
N-NITROSO
COMPOUNDS**



Model 502
**Thermal
Energy
Analyzer**

* Patents Pending

Measurements at the ppb level and lower in minutes. This important new research tool will find immediate applications in analyses for

**Cancer Research Air/Water Quality
Food and Liquor Metabolic Studies
Pesticides Drug Residues**

**Thermo
Electron**
CORPORATION

Cancer Research Division

85 First Avenue
Waltham, MA 02154, U.S.A.
Telephone (617) 890-8700
Telex 92-3323
Cable TEECORP

Circle No. 416 on Readers' Service Card

environmental and technicolgical hazards."

3 August. (R. J. Weir, discussion leader): C. Peraino, "Drug-induced enhancement of hepatic tumorigenesis"; W. G. Flamm, "Metabolism of procarcinogens by rodent liver extracts." (J. Campbell, discussion leader); R. A. Squire, "Evaluation of neoplastic response in mouse and rat livers."

4 August. (H. C. Grice, discussion leader): J. M. Rice, "Relevance to safety evaluation protocols of rodent response to carcinogens during fetal and neonatal life"; J. M. Spyker, "Functional evaluation of developmental disorders." (R. A. Scala, discussion leader); R. Willes, "The significance of alterations in physiology and behavior as indicators of a toxic response."

5 August. (G. Levinskas, discussion leader): D. Salsburg, "The statistical power of life-time studies in rodents to detect drug carcinogenicity in the presence of pharmacological activity"; C. J. Kodoski, "Safety factor considerations in toxicological evaluations." (A. M. Wolven, discussion leader): (Speaker and subject to be announced).

6 August. (J. F. Borzelleca, discussion leader): J. Beare-Rogers, "Dietary effects on *Brassica* oils."

Tumor Immunology

Holderness School

Ingegerd Hellström, chairman; D. Stewart Sell, vice chairman.

19 July. Genetic aspects of the immune response, with particular emphasis on the response to tumor antigens (chairman to be announced): Frank Lilly; David Gasser, discussant. Natural immunity to tumor antigens (Mary Fink, chairman): Robert Nowinski; Theodore Pincus, Ronald Herberman, discussants.

20 July. Molecular nature of tumor antigens (chairman to be announced): Jack Strominger; Stanley Nathenson, R. Reisfeld, Gary David, discussants. Embryonic antigens in tumors (Stewart Sell, chairman): R. Baldwin; M. Edidin and M. Hanna, discussants.

21 July. In vitro sensitization to tumor antigens (J.-C. Cerottini, chairman): Michael Feldman; (discussants to be announced). Nature of effector and suppressor cells in tumor immunity systems, and their mechanisms of action (Avion Mitchison, chairman): Melvin Cohn; Max Cooper, R. Gershon, Darcy Wilson, discussants.

22 July. Evidence for immunity to human tumor antigens (B. Bloom, chairman): Karl Erik Hellström; Mitsuo Takasugi,

Evan Hersh, Eero Saksels, discussants. Workshops: H. Winn, "Immune response to animal tumors"; Bernard Amos, "Immune response to human tumors."

23 July. Macrophages in tumor immunity (Anthony Allison, chairman): Peter Alexander; Steve Russel, discussant.

Water and Aqueous Solutions, Chemistry and Physics of

Holderness School

Frank H. Stillinger, chairman; Robert H. Wood, vice chairman.

2 August. P. F. Low, "Water at the mineral/water interface"; R. Zana, "Influence of water on kinetics of micellization"; W. Kauzmann, "Pressure effects on water and the validity of theories of water behavior"; P. Delahay, "Photoelectron spectroscopy of liquids and solutions"; R. D. Birkhoff, "Collective electronic oscillations in water and other liquids"; P. L. M. Plummer, "Nucleation of water and ice."

3 August. D. Chandler, "RISM theories for liquid water"; P. A. Kollman, "Theoretical studies of noncovalent interactions involving water"; A. Ben-Naim, "Present status of theory and experiment concerning hydrophobic interaction"; W. P. Jencks, "Polar and nonpolar interactions in aqueous solutions"; J. E. Desnoyers, "Thermodynamics of electrolyte-non-electrolyte interactions"; R. Battino, "Solubility of gases in water."

4 August. P. von Hippel, "Water structure, the Hofmeister series of ions, and biopolymer conformation"; F. Franks, "Small-molecule pair and triplet interactions in dilute solution"; I. D. Kuntz, "Kinetics of water motion in biological systems"; C. J. Montrose, "Depolarized Rayleigh light scattering and relaxation dynamics in water"; D. F. Evans, "Selective transport of ions across membranes"; J. Jonas, "Experimental studies of the dynamic structure of compressed water."

5 August. K. S. Pitzer, "Theory of concentrated electrolytes including mixtures with nonelectrolytes, and applications at high temperatures"; J. P. Valteau, "Monte Carlo studies of polar solvents and ionic forces"; F. Gibbard, "Experimental verification of the charge-asymmetric limiting law"; M. Sceats, "Structural studies of amorphous ice"; C. A. Angell, "More on supercooled water"; A. P. MacKenzie, "Nonequilibrium freezing behavior of aqueous systems of biological interest."

6 August. E. Whalley, "What we can learn about water from the properties of ice"; J. E. Enderby, "Recent progress in the structure of aqueous solutions"; A. H. Narten, "Diffraction: a status report."

First in Instruments Serving Science, Industry, Healthcare, and Education Since 1908

Specify . . .

LAB-LINE

for all your LABORATORY INSTRUMENT REQUIREMENTS...

MULTI-BLOK HEATERS . . .

- 5 Models—up to 6 Bloks
- 10 Interchangeable Aluminum Bloks
- 168 Different Combinations
- "Lo" and "Hi" Thermostats



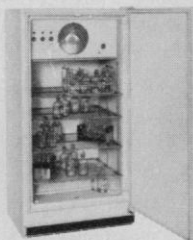
Bulletin 327

AMBI-HI-LO

ENVIRONMENTAL CHAMBERS . . .

3 Sizes—4 Models

- B.O.D. Tests
- General Incubations
- Serum Studies
- Enzyme Testing
- Storing Samples



Bulletin 53

ORBIT SHAKERS . . .

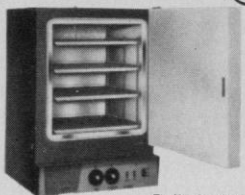
12 Models—130 Interchangeable Platforms

- Orbital Speeds from 0 to 500 rpm.
- Interchangeable Platforms Accommodate a Wide Variety of Glassware
- Eight Controlled Temperature Models

Cat. No. 274



OVENS—20 Models



Bulletin 417.1

- Radiant Wall Heat
- Maximum Loading Capacity
- Excellent Uniformity

CONDUCTIVITY METERS—4 Models



Bulletin 191.1

- Battery Operated
- Unbreakable Cells
- 5 yr. Warranty

MIXERS & STIRRERS—20 Models

- Single Units
- Multiple Units
- Heated Models
- Unheated Models

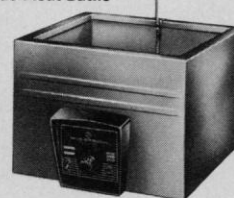


Bulletin 385

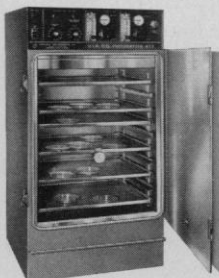
WATER BATHS—Over 50 Models

- Serological
- Utility
- Coliform
- Tissue Float Baths

Bulletin 17



INCUBATORS—50 Models



V.I.P. CO₂ INCUBATORS with exclusive automatic De-Gradientator air circulation system; precise CO₂ controls.

Cat. No. 773

ENVIRONMENTAL CHAMBERS World's Widest Selection . . .



Over 180 standard and custom designed models... "reach-in" chambers to multiple "walk-in" chambers. Finest environmental control. Over 65 years of unequalled experience.

Bulletin 283.1

EXPLOSION-PROOF FRIGID CABS AND FREEZERS—6 Models



All Lab-Line Frigid Cabs and Freezers have 100% safe, 3 way protection from fumes in the chamber, fumes seeping into the exterior and fumes in the surrounding atmosphere.

Bulletin 39

There are literally thousands of other Lab-Line products to choose from, each designed to perform accurately, more effectively, and cover all of your basic laboratory and control requirements.



LAB-LINE INSTRUMENTS, Inc.
Designers and Manufacturers
Lab-Line Plaza
Melrose Park, Illinois 60160

**AVAILABLE ONLY FROM EXCLUSIVE LAB-LINE
DISTRIBUTORS THROUGHOUT THE WORLD**

Please Rush Me the following LAB-LINE Catalogs:

- ☐ CO₂ Incubator Cat. No. 773 ☐ Orbit Shaker Cat. No. 274
☐ LAB-LINE General Catalog ☐ Bulletin No. _____

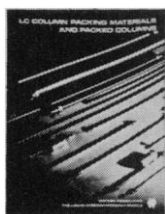
Name _____
Title _____ Dept. _____
Institution _____
Address _____
City _____ State _____ Zip Code _____

S-3

NEW required reading

from Waters — the Liquid
Chromatography People

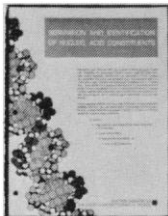
LC Packing Materials and Packed Columns Catalog.



A complete descriptive price list of Waters Associates' wide selection of column packing materials for high speed/high resolution chromatography. Ask for DS 013.

Circle No. 377 on Readers' Service Card

Separation and Identification of Nucleic Acid Constituents.



4 pgs. Describes the LC separation of DNA and RNA and their constituents — purine and pyrimidine bases, nucleosides and mononucleotides. Ask for AN 147.

Circle No. 378 on Readers' Service Card

Molecular Weight Distribution of Polymers.



New Way to Tell Good from Bad. This 12 pg. brochure describes various exclusion chromatography methods used to characterize rubber, paints, resins, oil and other complex polymer materials. Ask for AN 163.

Circle No. 379 on Readers' Service Card

free from



201 Maple Street, Milford, Ma 01757
Telephone (617) 478-2000

The Liquid Chromatography People

BOOKS RECEIVED

(Continued from page 1044)

tion. Proceedings of a symposium, Bressanone, Italy, May 1975. E. Carafoli, F. Clementi, W. Drabikowski, and A. Margreth, Eds. North-Holland, Amsterdam, and Elsevier, New York, 1975. xii, 588 pp., illus. \$45.95.

Career Management. A Guide to Combating Obsolescence. Harold G. Kaufman, Ed. IEEE Press, New York, 1975. vi, 442 pp., illus. \$17.95. To members: cloth, \$13.45; paper, \$8.95. IEEE Press Selected Reprint Series.

A Comparative Analysis of Complex Organizations. On Power, Involvement, and Their Correlates. Amitai Etzioni. Free Press (Macmillan), New York, and Collier Macmillan, London, ed. 2, 1975. xxiv, 584 pp. cloth, \$13.95; paper, \$5.95.

Comprehensive Virology. Vol. 5, Structure and Assembly. Virions, Pseudovirions, and Intraviral Nucleic Acids. Heinz Fraenkel-Conrat and Robert R. Wagner, Eds. Plenum, New York, 1975. x, 226 pp., illus. \$22.50.

Conserving Energy. Prospects and Opportunities in the New York Region. Joel Darmstadter. Published for Resources for the Future by Johns Hopkins University Press, Baltimore, 1975. xii, 108 pp. Cloth, \$8.95; paper, \$2.95.

Contemporary Topics in Molecular Immunology. Vol. 4. F. P. Inman and W. J. Mandy, Eds. Plenum, New York, 1975. xii, 248 pp., illus. \$22.50.

Delinquent Behavior. Don C. Gibbons. Prentice-Hall, Englewood Cliffs, N.J., ed. 2, 1976. vi, 298 pp. \$10.95.

De Ventis. Theophrastus. Translated from the Greek and edited by Victor Coutant and Val L. Eichenlaub. University of Notre Dame Press, Notre Dame, Ind., 1975. lx, 106 pp. \$9.95.

Diffraction Physics. John M. Cowley. North-Holland, Amsterdam, and Elsevier, New York, 1975. xiv, 410 pp., illus. \$56.25.

Digital Electronics and Laboratory Computer Experiments. Charles L. Wilkins, Sam P. Perrone, Charles E. Klopfenstein, Robert C. Williams, and Donald E. Jones. Plenum, New York, 1975. viii, 284 pp., illus. \$15.

The Dilemmas of Euthanasia. John A. Behnke and Sissela Bok. Anchor/Doubleday, Garden City, N.Y., 1975. x, 188 pp. Paper, \$2.95.

Drugs Demystified. Drug Education. Helen Nowlis. Unesco Press, Paris, 1975 (U.S. distributor, Unipub, New York). 92 pp. Paper, \$2.

Encyclopedia of Computer Science and Technology. Vol. 2, AN/FSQ to Bal. Jack Belzer, Albert G. Holzman, and Allen Kent, Eds. Dekker, New York, 1975. x, 494 pp., illus. \$60.

The Environment and Social Behavior. Privacy, Personal Space, Territory, Crowding. Irwin Altman. Brooks/Cole, Monterey, Calif., 1975. xii, 256 pp., illus. \$6.95.

Environmental Noise Control. Edward B. Magrab. Wiley-Interscience, New York, 1975. xii, 300 pp., illus. \$17.95.

The Enzymes. Vol. 11, Oxidation-Reduction. Part A. Paul D. Boyer, Ed. Academic Press, New York, ed. 3, 1975. xxviii, 658 pp., illus. \$48.

Ethical Constraints and Imperatives in Medical Research. Maurice B. Visscher. Thomas, Springfield, Ill., 1975. x, 116 pp. \$8.50. American Lecture Series Publication No. 983. A Monograph in the Bannerstone Division of American Lectures in Behavioral Science and Law.

Ethnicity and Resource Competition in Plural Societies. Papers from a congress, Chicago, Aug. 1973. Leo A. Despres, Ed. Mouton, The Hague, 1975 (U.S. distributor, Aldine, Chicago). xii, 222 pp. \$12.50. World Anthropology.

The Eukaryote Chromosome. Papers from a

conference, Canberra, Australia, 1973. W. J. Peacock and R. D. Brock, Eds. Australian National University Press, Canberra, 1975 (U.S. distributor, International Scholarly Book Services, Portland, Ore.). x, 500 pp., illus. Paper, \$26.30.

Faith, Keyes, and Clark's Industrial Chemicals. Frederick A. Lowenheim and Marguerite K. Moran. Wiley-Interscience, New York, ed. 4, 1975. xii, 904 pp., illus. \$47.50.

Fields of the Tzotzil. The Ecological Bases of Tradition in Highland Chiapas. George A. Collier. University of Texas Press, Austin, 1975. xvi, 256 pp., illus. \$9.75. The Texas Pan American Series.

Finite Dimensional Multilinear Algebra. Part 2. Marvin Marcus. Dekker, New York, 1975. xvi, 718 pp. \$36.50. Monographs and Textbooks in Pure and Applied Mathematics, 23.

Five Centuries of Map Printing. David Woodward, Ed. University of Chicago Press, Chicago, 1975. xii, 178 pp., illus. \$17.50. The Kenneth Nebenzahl, Jr., Lectures in the History of Cartography at the Newberry Library.

Flame Emission and Atomic Absorption Spectrometry. Vol. 3, Elements and Matrices. John A. Dean and Theodore C. Rains, Eds. Dekker, New York, 1975. xii, 674 pp., illus. \$49.50.

Fluid Mechanics, Thermodynamics of Turbomachinery. S. L. Dixon. Pergamon, New York, ed. 2, 1974. x, 258 pp., illus. Cloth, \$12.50; paper, \$8. Thermodynamics and Fluid Mechanics Series. Pergamon International Library.

Food Process Engineering. H. A. Leniger and W. A. Beverloo. Reidel, Boston, 1975. x, 552 pp., illus. Cloth, \$39; paper, \$19.

Formal Methods in Economic Anthropology. Papers from a conference, St. Louis, Oct. 1972. Stuart Plattner, Ed. American Anthropological Association, Washington, D.C., 1975. vi, 218 pp., illus. Paper, \$4.

Genetic Fix. The Next Technological Revolution. Amitai Etzioni. Harper and Row, New York, 1975. 276 pp. Paper, \$2.95. Harper Colophon Books. Reprint of the 1973 edition.

Glacial and Periglacial Geomorphology. Clifford Embleton and Cuchlaine A. M. King. Halsted (Wiley), New York, ed. 2, 1975. Two volumes, illus. Vol. 1, Glacial Geomorphology. x, 574 pp. Cloth, \$49.50; paper \$24.95. Vol. 2, Periglacial Geomorphology. x, 204 pp. Cloth, \$35; paper, \$12.50.

Graduate Science Education. Student Support and Postdoctorals, Fall 1973. National Science Foundation, Washington, D.C., 1975 (available from the Superintendent of Documents, Washington, D.C.). viii, 86 pp., illus. Paper, \$2.15. NSF 74-318. Surveys of Science Resources Series.

Grants. How to Find Out about Them and What to Do Next. Virginia P. White. Plenum, New York, 1975. xiv, 354 pp. \$19.80.

A Guide to International Recommendations on Names and Symbols for Quantities and on Units of Measurement. D. Armstrong Lowe. World Health Organization, Geneva, 1975 (U.S. distributor, Q Corp., Albany, N.Y.). 314 pp. Paper, \$20.20. Progress in Standardization, 2.

Handbook of Psychopharmacology. Leslie L. Iversen, Susan D. Iversen, and Solomon H. Snyder, Eds. Plenum, New York, 1975. Vol. 5, Synaptic Modulators. xii, 382 pp., illus. \$29.50. Vol. 6, Biogenic Amine Receptors. xii, 308 pp., illus. \$25.





Hazard Control Policy in Britain. John C. Chicken. Pergamon, New York, 1975. viii, 194 pp. \$14.50.

High-Speed Pulse Techniques. J. A. Coekin. Pergamon, New York, 1975. xii, 220 pp., illus.

HP9830A USERS: HAS THIS EVER HAPPENED TO YOU?



Memory overflow problems can now be a thing of the past. The EM-30 Extended Memory System eliminates the necessity of re-designing your programs as a result of ERROR 2.

-  You can now economically expand the read/write memory capacity of your 9830 to a full 32K bytes.
-  You can easily work with large arrays of data without resorting to peripheral storage.
-  With the EM-30 you are assured of full compatibility with all software, peripherals, and HP ROM options.
-  The EM-30 is a direct plug-in replacement for HP memory and you can install it in minutes with just a screwdriver.

The HP9830A* already approaches the power of a minicomputer. The EM-30 Extended Memory System significantly furthers the dimensions of this versatile machine by giving you minicomputer memory capacity with desk-top convenience. For as little as \$4,230 you can expand a fully loaded 15K byte 9830 to 32K bytes. You can integrate the extended memory capability of the EM-30 into the 9830 without changing any of your existing programs.

The design of the EM-30 Extended Memory System is based on proven 4K RAM chips for low power requirements and high reliability. All units have passed extensive tests to ensure that they are consistent with the high quality and reliability that you expect from HP products.

INTRODUCTORY OFFER: Send us a list of your ROM's, options and peripherals and we will send you a cassette containing a collection of appropriate commercial programs. Your name will be added to a growing list of 9830 users who are interested in a mutual exchange of programs and techniques. For additional information circle the reader number or call us collect.



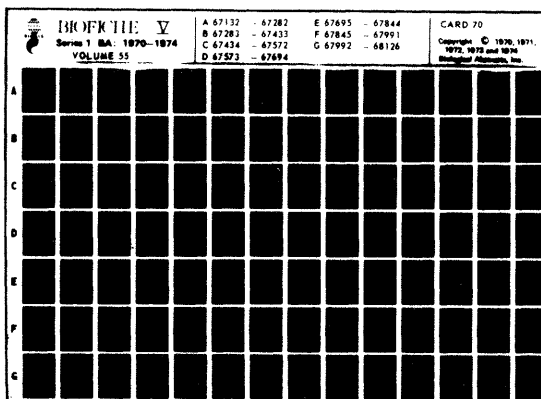
Infotek Systems

733 E. Edna Place • Covina, Calif. 91723
(213) 966-7431 • TWX 910-584-1812



Circle No. 430 on Readers' Service Card

Announcing A 5-Year Collective... of BIOLOGICAL ABSTRACTS!



New BIOFICHE V™

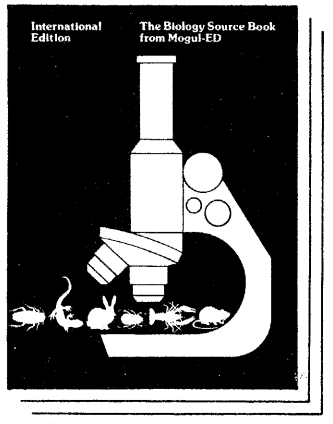
New BIOFICHE V (Series 1970-1974) ■ 700,000 BA Abstracts!
■ Completely Cumulated Indexes ■ Authors
(About 40,000 pages) ■ Subject/Generic ■ Biosystematic

BIOFICHE V will be both an opportunity to acquire BA as a new reference source, and a space-saving aid for present subscribers. An optional microfiche reader plan is available. For full information write or call BIOSIS, Marketing Bureau, 2100 Arch St., Philadelphia, Pa., U.S.A. 19103, (215) LO 8-4016.



**Everything you've
always wanted to know
about biological
supplies**

**The Mogul-ED Biology
Source Book
(Our best seller)**



New, larger edition of the Mogul-ED Biology Source Book expanded to feature more than 4,500 items. Individual sections covering: living materials, preserved specimens, microscope slides, audio visual supplies, kits, laboratory equipment, glassware, chemicals, osteological preparations, anatomical models. All items cross-indexed for easy reference.

The industry's best-known catalogue regularly used by educators, researchers, physicians, dentists, and individuals in the health sciences. Everything required for *any* life science program — EIS, ESS, PCP, MAPS, etc.

Use the coupon for your **FREE** copy.

.....

Please send along a copy of the Mogul-ED Biology Source Book.

Name/Title _____

Institution _____


Street Address _____

City _____

State _____

Zip _____

.....

**For fastest results, bug us with
your order on our toll-free
number (800) 558-0216** 

Mogul-ED
QUALITY PRODUCTS FOR EDUCATION

P. O. Box 2482
Oshkosh, Wisconsin 54901

Cloth, \$12; paper, \$8.50. Applied Electricity and Electronics. Pergamon International Library.

History of General Physiology. 600 B.C. to A.D. 1900. Thomas S. Hall. University of Chicago Press, Chicago, 1975. Two volumes. Vol. 1, From Pre-Socratic Times to the Enlightenment. xii, 420 pp. Paper, \$6.50. Vol. 2, From the Enlightenment to the End of the Nineteenth Century. viii, 400 pp. Paper, \$6.50. Reprint of *Ideas of Life and Matter* (1969).

Hormonal Correlates of Behavior. Vol. 2, An Organismic View. Basil E. Eleftheriou and Richard L. Sprott, Eds. Plenum, New York, 1975. xviii + pp. 441-806, illus. \$29.50.

Hormones, Homeostasis and the Brain. Proceedings of a congress, Utrecht, July 1974. W. H. Gispen, Tj. B. van Wimersma Greidanus, B. Bohus, and D. de Wied, Eds. Elsevier, New York, 1975. xx, 382 pp., illus. \$60.50. Progress in Brain Research, vol. 42.

The Hospital. A Social and Architectural History. John D. Thompson and Grace Goldin. Yale University Press, New Haven, Conn., 1975. xxviii, 350 pp., illus. \$25.

Human Beings. The Psychology of Human Experience. Liam Hudson. Anchor/Doubleday, Garden City, N.Y., 1975. viii, 232 pp. Paper, \$2.95.

Hunting with the Microscope. Gaylord Johnson and Maurice Bleifeld. Arco Publishing Co., New York, ed. 2, 1976. 126 pp., illus. Paper, \$2.25. A Sentinel Book.

Hydroponics. The Bengal System with Notes on Other Methods of Soilless Cultivation. J. Sholto Douglas. Oxford University Press, New York, ed. 5, 1975. xvi, 186 pp. + plates. \$4.25.

Infant Perception. From Sensation to Cognition. Vol. 2, Perception of Space, Speech, and Sound. Leslie B. Cohen and Philip Salapatek, Eds. Academic Press, New York, 1975. xvi, 246 pp., illus. \$17.50. The Child Psychology Series.

Interest and Ideology. The Foreign Policy Beliefs of American Businessmen. Bruce M. Russett and Elizabeth C. Hanson. Freeman, San Francisco, 1975. xvi, 296 pp. Cloth, \$10.95; paper, \$4.95.

An Introduction to Experimental Surgery. A Guide to Experimenting with Laboratory Animals. J. De Boer, J. Archibald, and H. G. Downie, Eds. Excerpta Medica, Amsterdam, and Elsevier, New York, 1975. xxviii, 680 pp., illus. \$79.25.

Living in Outer Space. George S. Robinson. Public Affairs Press, Washington, D.C., 1975. xii, 120 pp. Paper, \$6.

Macromolecular Reviews. Vol. 10. A. Peterlin, M. Goodman, H. F. Mark, S. Okamura, and B. H. Zimm, Eds. Interscience (Wiley), New York, 1975. iv, 236 pp., illus. Paper, \$14.50. Journal of Polymer Science.

Maritime Adaptations of the Pacific. Papers from a congress, Chicago, Aug. 1973. Richard W. Casteel and George I. Quimby, Eds. Mouton, The Hague, 1975 (U.S. distributor, Aldine, Chicago). x, 320 pp., illus. \$28.50. World Anthropology.

The Methodology of Anthropological Comparisons. An Analysis of Comparative Methods in Social and Cultural Anthropology. Gopala Sarana. Published for the Wenner-Gren Foundation for Anthropological Research by University of Arizona Press, Tucson, 1975. viii, 118 pp. Paper, \$4.95. Viking Fund Publications in Anthropology, No. 53.

Methods in Cell Biology. Vol. 11, Yeast Cells. David M. Prescott, Ed. Academic Press, New York, 1975. xiv, 346 pp., illus. \$27.50.

Methods of Protein Separation. Vol. 1. Nicholas Catsimpoilas, Ed. Plenum, New York, 1975. xiv, 282 pp., illus. \$27.50.

Migration and Development. Implications for Ethnic Identity and Political Conflict. Papers from a congress, Chicago, Aug. 1973. Helen I. Safa and Brian M. du Toit, Eds. Mouton, The Hague, 1975 (U.S. distributor, Aldine, Chicago). xvi, 336 pp. \$16.50. World Anthropology.

Migration and Urbanization. Models and Adaptive Strategies. Papers from a conference, Oshkosh, Wis., Aug. 1973. Brian M. du Toit and Helen I. Safa, Eds. Mouton, The Hague, 1975 (U.S. distributor, Aldine, Chicago). xii, 306 pp. \$15.50. World Anthropology.

Modern Cell Biology. William D. McElroy and Carl P. Swanson. Prentice-Hall, Englewood Cliffs, N.J., ed. 2, 1976. xvi, 398 pp., illus. Paper, \$9.25. Prentice-Hall Biological Sciences Series.

Multivariate Statistical Methods. William R. Atchley and Edwin H. Bryant, Eds. Dowden, Hutchinson and Ross, Stroudsburg, Pa., 1975 (distributor, Halsted [Wiley], New York). Two volumes, illus. Vol. 1, Among-Groups Covariation. xvi, 464 pp. \$27. Vol. 2, Within-Groups Covariation. xvi, 436 pp. \$26. Benchmark Papers in Systematic and Evolutionary Biology, vols. 1 and 2.

The Natural History of Rabies. Vol. 2. George M. Baer, Ed. Academic Press, New York, 1975. xvi, 388 pp., illus. \$36.

Nebraska Symposium on Motivation 1974. James K. Cole and Theo B. Sonderegger, Eds. University of Nebraska Press, Lincoln, 1975. xviii, 310 pp., illus. Paper, \$6.95. Current Theory and Research in Motivation, vol. 22.

Neural and Endocrine Aspects of Behaviour in Birds. Papers from a conference, Edinburgh, July 1974. Peter Wright, Peter G. Caryl, and David M. Vowles, Eds. Elsevier, New York, 1975. x, 408 pp., illus. \$40.95.

Non-Simple Liquids. I. Prigogine and Stuart A. Rice, Eds. Interscience (Wiley), New York, 1975. xii, 496 pp., illus. \$34.95. Advances in Chemical Physics, vol. 31.

Olfaction and Taste. Vol. 5. Proceedings of a symposium, Melbourne, Australia, Oct. 1974. Derek A. Denton and John P. Coghlan, Eds. Academic Press, New York, 1975. xxiv, 460 pp., illus. \$22.50.

On Measures of Information and Their Characterizations. J. Aczél and Z. Daróczy. Academic Press, New York, 1975. xii, 234 pp. \$24.50. Mathematics in Science and Engineering, vol. 115.

Opportunistic Fungal Infections. Proceedings of a conference, Lexington, Ky., Mar. 1972. Ernest W. Chick, Albert Balows, and Michael L. Furcolow, Eds. Thomas, Springfield, Ill., 1975. x, 360 pp., illus. \$22.50. American Lecture Series, No. 974. A Monograph in the Bannerstone Division of the American Lectures in Clinical Microbiology.

Optimization Problems. L. Collatz and W. Wetterling. Translated from the German edition (Heidelberg, 1966) by P. Wadsack. Springer-Verlag, New York, 1975. x, 356 pp., illus. Paper, \$14.50. Applied Mathematical Sciences, vol. 17.

The Organic Chemistry of Electrolyte Solutions. John E. Gordon. Wiley-Interscience, New York, 1975. xxii, 554 pp., illus. \$27.50. Interscience Monographs on Organic Chemistry.

Organochromium Compounds. R. P. A. Sneed. Academic Press, New York, 1975. viii, 328 pp., illus. \$33. Organometallic Chemistry.

PASCAL User Manual and Report. Kathleen Jensen and Niklaus Wirth. Springer-Verlag, New York, ed. 2, 1975. viii, 168 pp., illus. Paper, \$5.90. Springer Study Edition.

The Pathogenic Anaerobic Bacteria. Louis DS. Smith. Thomas, Springfield, Ill., ed. 2, 1975. xiv, 430 pp. \$26.75. American Lecture Series, Publication No. 980. A Monograph in the

INTRODUCTION TO FOREST GENETICS

by JONATHAN W. WRIGHT

This new textbook fills a major gap in the curricula of the rapidly burgeoning field of forestry. It provides a comprehensive, up-to-date introduction to the principles and practices of applied forest tree improvement, and is especially designed for graduate and upper-level undergraduate students with no prior training in genetics or statistics. Basic concepts and techniques applicable to the improvement of both forest and orchard trees are carefully elucidated. The five introductory chapters cover the basic principles of Mendelian and population genetics most used in tree breeding. These are followed by three chapters devoted to commonly used techniques. The remaining eleven chapters cover selective breeding, provenance testing, hybridization, exotics, and chromosome manipulation.

1976, 388 pp., \$19.50/£10.15

IMMOBILIZED ENZYMES FOR INDUSTRIAL REACTORS

edited by RALPH A. MESSING

CONTENTS: R. A. Messing, Introduction and General History of Immobilized Enzymes. D. J. Lartigue, Basic Enzymology. A. M. Filbert, Controlled-Pore Glasses for Enzyme Immobilization. R. A. Messing, Carriers. R. A. Messing, Immobilization by Adsorption and Inorganic Bridge Formation. H. H. Weetall, Immobilization of Proteins by Covalent and Entrapment Processes. D. J. Lartigue, Characteristics of Free vs. Immobilized Enzymes. H. J. Bright, Immobilized Coenzymes. W. H. Pitcher, Jr., Design and Operation of Immobilized Enzyme Reactors. H. H. Weetall, Applications of Immobilized Enzymes.

1975, 244 pp., \$13.50/£6.50

MOTOR CONTROL

Issues and Trends

edited by GEORGE E. STELMACH

This book makes available in a single volume a very large, diverse, and widely scattered literature on motor control. The problem of motor control is one of understanding the way in which the organism encodes, organizes, stores, and retrieves movement information. Here are some of the special features of this volume: provides a comprehensive, up-to-date review of contemporary issues in motor behavior research; presents a thorough investigation of the central and peripheral determinants of movement; integrates and distinguishes between closed-loop and schema models of motor learning; reviews the relevant topics of attention, inter-sensory integration, motor programs, and timing; important leads to journals and monographs of the specialized literature are provided.

1976, 256 pp., \$17.50/£9.10

PAABS Symposium Series, Volume 3

HYPOGLYCEIN

edited by E. A. KEAN

reprinted from *West Indian Medical Journal*

1976, 183 pp., \$20.00/£10.40

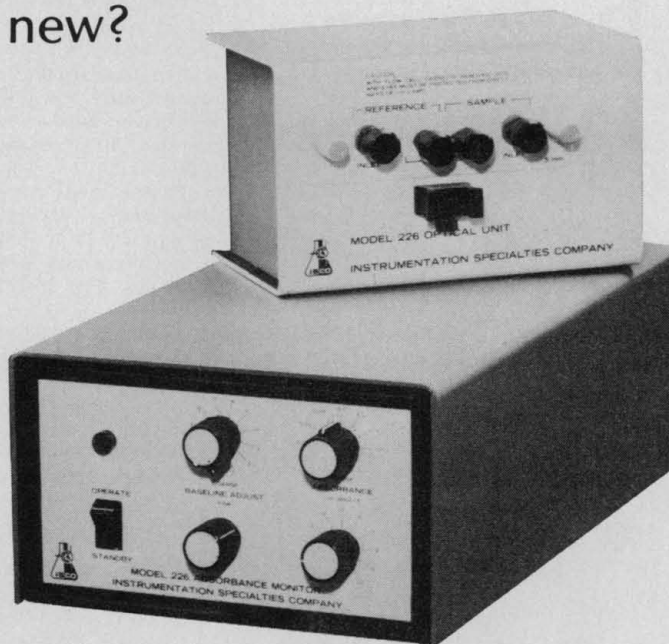
N.B.: Postage plus 50¢ handling charge on all orders not accompanied by payment.
Prices subject to change without notice.

ACADEMIC PRESS, INC.

A Subsidiary of Harcourt Brace Jovanovich, Publishers
111 FIFTH AVENUE, NEW YORK, N. Y. 10003
24-28 OVAL ROAD, LONDON NW1 7DX

Circle No. 300 on Readers' Service Card

Why would ISCO introduce an absorbance monitor that offers nothing new?



The specifications of the new ISCO Model 226 are typical of other high performance monitors: double beam optics; operation at 254 and 280 nm; sensitivity ranges from 0.01 to 1.0 Abs full scale; peak-to-peak noise of only 0.00015 Abs; 0 to 40°C operating range; easily removable, small volume flow cells.

But the Model 226 does have something special—it costs only \$995.

Did you know that for the price others ask for their versions of the 226 you could have an ISCO UA-5? This instrument is **really** special. It offers a choice of 13 wavelengths and can measure at any 2 simultaneously. It has a large built-in recorder, automatic peak separation, and 4x scale expansion. Its outstanding response speed makes it an excellent HPLC detector. In addition, with ISCO's specialized flow cells and accessories, the UA-5 can scan gels, zonal rotor effluents, and centrifuged and isoelectrically focused gradients. If you need this sort of versatility, there is no substitute for the UA-5. But if a simple, high quality monitor will do, don't pay somebody else a UA-5 price for 226 specifications.

Both instruments are fully described in our new catalog. Send for your copy now.



ISCO

BOX 5347

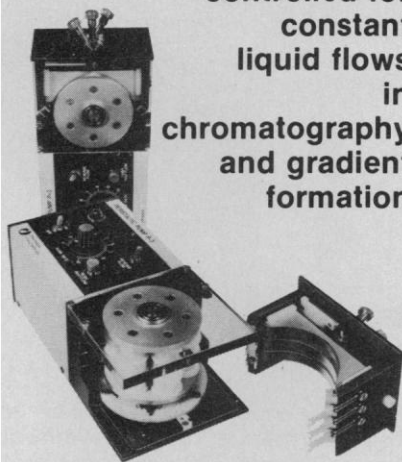
LINCOLN, NEBRASKA 68505 (402) 464-0231 TELEX 48-6453

Circle No. 361 on Readers' Service Card

NEW

Pharmacia Peristaltic Pump P-3

A compact pump
electronically
controlled for
constant
liquid flows
in
chromatography
and gradient
formation



You can

- obtain three different flow rates at the same time through the three individually tensioned pumping channels
- change tubes in seconds with the snap-in cassette
- forget about pulsation thanks to the large driven rollers
- rely on a constant motor speed, electronically compensated for load and temperature
- use any flow rate between 0.6 and 400 ml/h per channel with the same gear box
- reverse the flow instantly
- push for maximum flow and clear pump lines rapidly

For free descriptive literature,
write or call:

Pharmacia Fine Chemicals Inc.
800 Centennial Avenue
Piscataway, New Jersey 08854
Phone (201) 469-1222



Pharmacia
Fine Chemicals

Circle No. 227 on Readers' Service Card

Bannerstone Division of American Lectures in Clinical Microbiology.

Perinatal Addiction. Proceedings of a conference, Nashville, Tenn., Sept. 1974. Raymond D. Harbison, Ed. Spectrum, New York, 1975 (distributor, Halsted [Wiley], New York). x, 392 pp., illus. \$25. Sociomedical Science Series. Reprinted from *Addictive Diseases*, Vol. 2, Nos. 1 and 2, 1975.

Perspectives on Black English. J. Dillard, Ed. Mouton, The Hague, 1975. 392 pp. Dfl. 48. Contributions to the Sociology of Language, 4.

Petroleum and the Continental Shelf of North-West Europe. Vol. 1, Geology. Proceedings of a conference, London. Austin W. Woodland, Ed. Halsted (Wiley), New York, 1975. x, 502 pp., illus. \$47.50.

Photosynthesis and Productivity in Different Environments. Papers from a meeting, Aberystwyth, 1973. J. P. Cooper, Ed. Cambridge University Press, New York, 1975. xxiv, 716 pp., illus. \$65. International Biological Programme 3.

Physical Organic Chemistry. The Fundamental Concepts. Calvin D. Ritchie. Dekker, New York, 1975. x, 284 pp., illus. \$16.50. Studies in Organic Chemistry, vol. 4.

Physics. Chris Zafiratos. Wiley, New York, 1976. xvi, 912 pp., illus. \$17.95.

Physique Atomique et Moléculaire et Matière Interstellaire. Atomic and Molecular Physics and the Interstellar Matter. Proceedings of a summer school, Grenoble, France, 1974. Roger Balian, Pierre Encrenas, and James Lequeux, Eds. North-Holland, Amsterdam, and Elsevier, New York, 1975. xxii, 632 pp., illus. \$66.75.

Planation Surfaces. Peneplains, Pediplains, and Etchplains. George F. Adams, Ed. Dowden, Hutchinson and Ross, Stroudsburg, Pa., 1975 (distributor, Halsted [Wiley], New York). xvi, 476 pp., illus. \$28. Benchmark Papers in Geology, vol. 22.

Plant Cell Biology. An Ultrastructural Approach. Brian E. S. Gunning and Martin W. Steer. Crane, Russak, New York, 1975. Various pagings, illus. Paper, \$8.95.

The Plasma Proteins. Structure, Function, and Genetic Control. Vol. 1. Frank W. Putnam, Ed. Academic Press, New York, ed. 2, 1975. xvi, 482 pp., illus. \$37.50.

Polymer Engineering. H. Leverne Williams. Elsevier, New York, 1975. x, 166 pp., illus. \$14.75. Chemical Engineering Monographs, vol. 1.

Population and Social Organization. Papers from a congress, Chicago, Aug. 1973. Moni Nag, Ed. Mouton, The Hague, 1975 (U.S. distributor, Aldine, Chicago). x, 368 pp. \$16.50. World Anthropology.

Population, Ecology, and Social Evolution. Papers from a congress, Chicago, Aug. 1973. Steven Polgar, Ed. Mouton, The Hague, 1975 (U.S. distributor, Aldine, Chicago). x, 354 pp. \$16.50. World Anthropology.

Portraits in the Wild. Behavior Studies of East African Mammals. Cynthia Moss. Houghton Mifflin, Boston, 1975. xviii, 364 pp. + plates. \$12.50.

Post-Synthetic Modification of Macromolecules. Proceedings of a meeting, Budapest, Aug. 1974. F. Antoni and Anna Faragó, Eds. North-Holland, Amsterdam, and Elsevier, New York, 1975. x, 174 pp., illus. \$15.50; set of seven volumes, \$129.25. Proceedings of the Ninth FEBS Meeting, vol. 34.

Prelude to Science. An Exploration of Magic and Divination. Richard Fernald Smith. Drawings by Anne Corrough. Scribner, New York, 1975. viii, 130 pp. \$7.95.

Principles and Applications of Tribology. Desmond F. Moore. Pergamon, New York, 1975.

xii, 388 pp., illus. Cloth, \$23; paper, \$15. International Series in Materials Science and Technology, vol. 14. Pergamon International Library.

Principles of Biochemical Tests in Diagnostic Microbiology. Donna J. Blazevec and Grace Mary Ederer. Wiley, New York, 1975. xvi, 136 pp., illus. \$12.50. Techniques in Pure and Applied Microbiology.

Principles of Hydrology. R. C. Ward. McGraw-Hill, New York, ed. 2, 1975. xvi, 368 pp., illus. \$15.

Principles of Visual Anthropology. Papers from a congress, Chicago, Aug. 1973. Paul Hockings, Ed. Mouton, The Hague, 1975 (U.S. distributor, Aldine, Chicago). xiv, 522 pp. + plates. \$24.50. World Anthropology.

Private Property and the Public Interest. The Brandywine Experience. Ann L. Strong. Johns Hopkins University Press, Baltimore, 1975. xxvi, 206 pp., illus. \$12. Johns Hopkins Studies in Urban Affairs.

Problems of Philosophy and Psychology. Jay N. Eacker. Nelson-Hall, Chicago, 1975. xii, 204 pp. \$11.

Proceedings of the Seminar on Boiler Modeling. Bedford, Mass., Nov. 1974. David A. Berkowitz, Ed. MITRE Corp., Bedford, Mass., 1975. xii, 368 pp., illus. Paper, \$15.

Programming Language/One. With Structured Programming. Frank Bates and Mary L. Douglas. Prentice-Hall, Englewood Cliffs, N.J., ed. 3, 1975. xiv, 336 pp. Cloth, \$12.50; paper, \$9.95.

Progress in Neurological Surgery. Vol. 6. H. Krayenbühl, P. E. Maspes, W. H. Sweet, P. Paoletti, and Ch. E. Poletti, Eds. Karger, Basel, 1975. xvi, 490 pp., illus. \$119.25.

Properties of Purified and Cholinergic and Adrenergic Receptors. Proceedings of a meeting, Budapest, Aug. 1974. Maria Wollemann, Ed. North-Holland, Amsterdam, and Elsevier, New York, 1975. viii, 148 pp., illus. \$13.50; set of seven volumes, \$129.25. Proceedings of the Ninth FEBS Meeting, vol. 37.

Proteases and Biological Control. Papers from a conference, Cold Spring Harbor, N.Y. E. Reich, D. B. Rifkin, and E. Shaw, Eds. Cold Spring Harbor Laboratory, Cold Spring Harbor, N.Y., 1975. x, 1022 pp., illus. \$40. Cold Spring Harbor Conferences on Cell Proliferation, vol. 2.

Protein Nutritional Quality of Foods and Feeds. Part 2, Quality Factors—Plant Breeding, Composition, Processing, and Antinutrients. Proceedings of a symposium, Atlantic City, N.J., Sept. 1974. Mendel Friedman, Ed. Dekker, New York, 1975. xx, 674 pp., illus. \$49.50. Nutrition and Clinical Nutrition, vol. 1.

Proteins of Contractile Systems. Proceedings of a meeting, Budapest, Aug. 1974. E. N. A. Biró, Ed. North-Holland, Amsterdam, and Elsevier, New York, 1975. viii, 232 pp., illus. \$19.95; set of seven volumes, \$129.25. Proceedings of the Ninth FEBS Meeting, vol. 31.

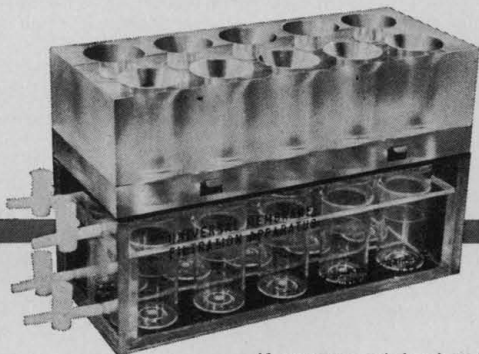
Proteinuria. Papers from a symposium, Hannover, Germany, June 1974. Georg M. Eisenbach, Hilmar Stolte, and Jan Brod, Eds. Karger, Basel, 1975. vi, 166 pp., illus. Paper, \$24. Contributions to Nephrology, vol. 1.

Proton-Transfer Reactions. Edward Caldin and Victor Gold, Eds. Chapman and Hall, London, and Halsted (Wiley), New York, 1975. viii, 448 pp., illus. \$47.50.

Psychiatry and Mysticism. Papers from three symposia, Dallas, 1972, Honolulu, 1973, and Detroit, 1974. Stanley R. Dean, Ed. Nelson-Hall, Chicago, 1975. xxii, 424 pp. + plates. \$15.

Psychoactive Drugs and Social Judgment. Theory and Research. Kenneth R. Hammond and C. R. B. Joyce, Eds. Wiley-Interscience,

Jack the Dripper



If your research involves DNA-RNA, or DNA-DNA Hybridization studies, NBS has the answer. A Universal Membrane Filtration Apparatus, equipped with reversible washing assembly and individual reservoirs, can now be employed for hybridization studies as well as rapid and complete filtration and/or collection of bacteria and precipitates; and protein-DNA-binding studies. To eliminate handling of individual reservoirs, a 10-cavity loading block can be quickly set in place for efficient filling and filtration. The entire battery of filters, clamped and sealed together, can be inverted at one time so that both sides of the 25 mm membranes can be repeatedly washed.

For complete information, ask for catalog DNAS/376



NBS
NEW BRUNSWICK SCIENTIFIC CO., INC.
1130 SOMERSET ST., NEW BRUNSWICK, N. J. 08903 201-846-4600

Circle No. 257 on Readers' Service Card

Scientific Freedom and Responsibility

An important new report from AAAS!

If you are concerned with the problems of responsibility and freedom as they relate to your professional work, you will find much of interest in *Scientific Freedom and Responsibility*.

- ▶ it examines the conditions necessary to give scientists and engineers the freedom and responsibility to speak out on the critical problems facing us today
- ▶ it discusses criteria and procedures for the objective, impartial study of conflicts concerning scientific freedom and responsible scientific conduct

Send for your copy today! Paper-bound, xiv+50 pp. ISBN 0-87168-224-9. Retail price \$3.45; AAAS member price prepaid \$2.95.

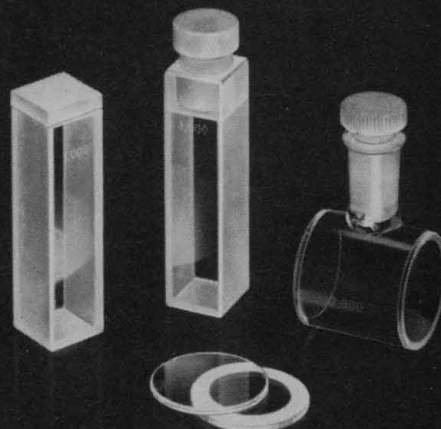
Send orders to Dept. SFR-2

**American Association for the
Advancement of Science**

1515 Massachusetts Avenue, N.W.
Washington, D.C. 20005

HELLMA

... tomorrow's designs today!



OS[®] QH[®] QS[®] OF[®] QU[®] QI[®]

Hellma—the largest assortment of highest precision glass and quartz cells.
Standard • Flow-through • Constant-temperature
Anaerobic • Special Designs
Also available—ULTRAVIOLET LIGHT SOURCES
Deuterium Lamps • Mercury Vapor Lamps
Hollow Cathode Lamps • Power Supplies

HELLMA
CELLS, INC.

Write for literature
Box 544
Borough Hall Station
Jamaica, New York 11424
Phone (212) 544-9534

Circle No. 180 on Readers' Service Card

Is scientific infighting making our "war on cancer" a losing battle?

"This marvelously entertaining and informative science book for the layman begins with the 1974 ink-stained mouse scandal at the Memorial Sloan-Kettering Cancer Center, and broadens to examine the dollar politics of cancer research and the often slovenly performance of the news media as it reports on critical scientific developments. The scandal broke when it was learned that Dr. William Summerlin, a high level center researcher, had darkened skin

grafts on mice with a pen to enhance results of immunological experiments linked to cancer research. Hixson explains in fascinating detail how two women reporters foiled the center's attempts to cover up the skulduggery, how such a discreditable episode could occur in the first place and how the scientific community reacted. The author also explores the question of who gets huge government research grants and why. A vital book on a life-and-death subject." —*Publishers Weekly*.



THE PATCHWORK MOUSE

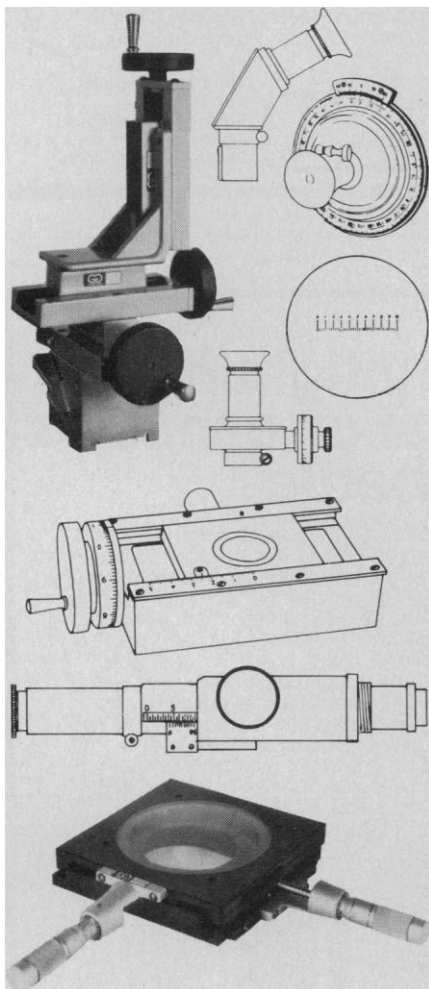
Joseph Hixson

At all booksellers **Anchor Press/Doubleday**

Send for Gaertner Information Kit:

Optical and mechanical modules for custom measuring and positioning assemblies

A wide line of basic optical instruments, plus scores of Gaertner interchangeable components and accessories enable you to build your own precision optical system. There's an ideal combination to solve almost any lab measuring, positioning, or observing problem quickly and easily. Our Optical System Selection Chart tells you part of the story. Additional details on all the Gaertner optical instruments shown (plus many others) are contained in our Bulletin 161. Write for a copy of each, plus a General Index of literature covering all Gaertner Instruments. Just ask for an Optical Measuring Information Kit. 3-211



Manufacturers
of **metric**
instrumentation
since 1896

GAERTNER SCIENTIFIC CORPORATION
1218 Wrightwood Ave., Chicago, Ill. 60614
Phone: (312) 281-5335

New York, 1975. xx, 278 pp., illus. \$16.95. Wiley Series on Personality Processes.

Psychology for Law Enforcement. Edward J. Green. Wiley, New York, 1976. xiv, 168 pp. Cloth, \$9.95; paper, \$4.95.

Quantum Statistics and the Many-Body Problem. Papers from a symposium, Sanibel Island, Fla., Jan. 1975. Samuel B. Trickey, Wiley P. Kirk, and James W. Dufty, Eds. Plenum, New York, 1975. xii, 288 pp., illus. \$27.50.

Queuing and Waiting. Studies in the Social Organization of Access and Delay. Barry Schwartz. University of Chicago Press, Chicago, 1975. vi, 218 pp. \$12.

Race, Science and Society. Leo Kuper, Ed. Unesco Press, Paris, and Columbia University Press, New York, 1975. 370 pp. Cloth, \$12; paper, \$4.95. Revision of *The Race Question in Modern Science* (1956).

Radio Power. Propaganda and International Broadcasting. Julian Hale. Temple University Press, Philadelphia, 1975. xx, 196 pp. \$12.50. International and Comparative Broadcasting.

The Rape of the Nile. Tomb Robbers, Tourists, and Archaeologists in Egypt. Brian M. Fagan. Scribner, New York, 1975. xiv, 400 pp., illus. \$14.95.

Reactivity of Flavins. Proceedings of a symposium, Nagoya, Japan, Sept. 1973. Kunio Yagi, Ed. University of Tokyo Press, Tokyo, 1975. xiv, 186 pp., illus. ¥5800.

Reading, Perception and Language. Papers from a congress, Rochester, Minn., Nov. 1974. Drake D. Duane and Margaret B. Rawson, Eds. Published in cooperation with the Orten Society by York Press, Baltimore, 1975. xii, 272 pp., illus. \$12.50.

Regulation of Growth and Differentiated Function in Eukaryote Cells. Papers from a symposium, New Delhi, Oct. 1974. G. P. Talwar, Ed. Raven Press, New York, 1975. xx, 564 pp., illus. \$35.

Resistance of *Pseudomonas aeruginosa*. M. R. W. Brown, Ed. Wiley-Interscience, New York, 1975. x, 336 pp., illus. \$37.50.

Reviews of Plasma Physics. Vol. 6. M. A. Leontovich, Ed. Translated from the Russian edition (Moscow, 1972) by Herbert Lashinsky. Consultants Bureau (Plenum), New York, 1975. xiv, 332 pp. \$29.50.

Rodents in Desert Environments. I. Prakash and P. K. Ghosh, Eds. Junk, The Hague, 1975. xvi, 624 pp., illus. Dfl. 180. Monographiae Biologicae, vol. 28.

The Rodents of Uganda. M. J. Delany. British Museum (Natural History), London, 1975. viii, 166 pp., illus. Paper, £2.

The Role of Natural Selection in Human Evolution. Papers from a conference, Burg Wartenstein, Austria, Aug. 1974. Francisco M. Salzano, Ed. North-Holland, Amsterdam, and Elsevier, New York, 1975. xiv, 440 pp., illus. \$47.95.

The Role of the Laboratory in Hemolytic Disease of the Newborn. John G. Gorman. Lea and Febiger, Philadelphia, 1975. xiv, 228 pp., illus. \$12.

The Roots of Ancient India. Walter A. Fairervis, Jr. University of Chicago Press, Chicago, ed. 2, 1975. xxxiv, 480 pp., illus. Paper, \$7.95. A Phoenix Book.

The Roots of Consciousness. Psychic Liberation through History, Science and Experience. Jeffrey Mishlove. Random, New York, and Bookworks, Berkeley, Calif., 1975. xxxiv, 342 pp., illus. Paper, \$9.95.

Rural Nutrition in Monsoon Asia. Robert Orr Whyte. Oxford University Press, New York, 1975. xxii, 296 pp., illus. \$22.75.

Safeguarding Psychiatric Privacy. Computer

Systems and Their Uses. Eugene M. Laska and Rheta Bank, Eds. Wiley, New York, 1975. xviii, 452 pp., illus. \$22. A Wiley Biomedical Publication.

Sample Size Choice. Charts for Experiments with Linear Models. Robert E. Odeh and Martin Fox. Dekker, New York, 1975. x, 190 pp., illus. \$18.50. Statistics, vol. 14.

The Sanctity of Social Life. Physicians' Treatment of Critically Ill Patients. Diana Crane. Russell Sage Foundation, New York, 1975 (distributor, Basic Books, New York). xviii, 286 pp. \$13.50.

Sea Surveying. A. E. Ingham, Ed. Wiley-Interscience, New York, 1975. Two volumes. Vol. 1 (text). x, 306 pp. Vol. 2 (illustrations). iv, 234 pp. \$49.50.

Seasons of the Salt Marsh. David Alan Gates. Illustrated by Edward and Marcia Norman. Chatham Press, Old Greenwich, Conn., 1975. 128 pp. \$8.95.

Sedimentation Models and Quantitative Stratigraphy. Walther Schwarzacher. Elsevier, New York, 1975. xii, 382 pp., illus. \$47.95. Developments in Sedimentology, 19.

Seeing with the Mind's Eye. The History, Techniques and Uses of Visualization. Mike Samuels and Nancy Samuels. Random, New York, and Bookworks, Berkeley, Calif., 1975. xx, 332 pp., illus. Paper, \$9.95.

Semiconductor Fundamentals. Robert F. Coughlin and Frederick F. Driscoll, Jr. Prentice-Hall, Englewood Cliffs, N.J., 1976. xviii, 318 pp., illus. \$14.95.

Social Behaviorism. Arthur W. Staats. Dorsey, Homewood, Ill., 1975. xvi, 656 pp. \$13.95. The Dorsey Series in Psychology.

Solar Energy. Papers from a lecture course, Sydney, Australia, Aug. 1974. H. Messel and S. T. Butler, Eds. Pergamon, New York, 1975. 340 pp., illus. Cloth, \$12.50; paper, \$7.50. Pergamon International Library.

The Stone Age Diet. Walter L. Voegtlin. Van-tage Press, New York, 1975. xx, 278 pp. \$6.95.

Structure and Function of Tundra Ecosystems. Papers from a meeting, Abisko, Sweden, Apr. 1974. T. Rosswall and O. W. Heal, Eds. Swedish Natural Science Research Council, Stockholm, 1975. 450 pp., illus. Paper, 50 SKr. Ecological Bulletins No. 20.

A Student's Introduction to Engineering Design. Harold A. Simon. Pergamon, New York, 1975. xvi, 348 pp., illus. Cloth, \$18; paper, \$12. Pergamon Unified Engineering Series.

A Study of Changing Pre-Columbian Commercial Systems. The 1972-1973 Seasons at Cozumel, Mexico. Jeremy A. Sabloff and William L. Rathje, Eds. Peabody Museum of Archaeology and Ethnology, Harvard University, Cambridge, Mass., 1975. xii, 148 pp., illus. + loose maps. Paper, \$7.50. Peabody Museum Monographs, No. 3.

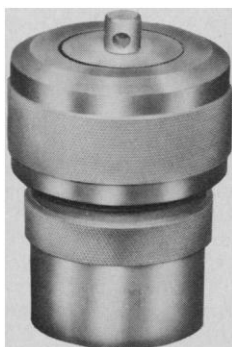
Surface Physics of Materials. J. M. Blakely, Ed. Academic Press, New York, 1975. Two volumes, illus. Vol. 1. xiv + pp. 1-278 + index \$29. Vol. 2. xiv + pp. 279-548. \$27. Materials Science and Technology.

Symmetry Discovered. Concepts and Applications in Nature and Science. Joe Rosen. Cambridge University Press, New York, xii, 138 pp., illus. \$11.95.

Theoretical Rheology. Proceedings of a conference, Cambridge, England, 1974. J. F. Hutton, J. R. A. Pearson, and K. Walters, Eds. Halsted (Wiley), New York, 1975. xvi, 378 pp., illus. \$37.50.

Theories of Group Processes. Gary L. Cooper, Ed. Wiley, New York, 1975. xii, 278 pp., illus. \$21. Wiley Series on Individuals, Groups and Organizations.

ACID DIGESTION BOMBS



The rapid and safe way to dissolve inorganic samples in HF, HCl or HNO₃, or to digest organic materials in strong alkalis or oxidizing acids with complete sample recovery.

Now available in two models: a **general purpose bomb** for temperatures to 150° C and pressures to 1200 psig, and a new **high pressure bomb** for samples which require dissolution temperatures up to 285° C and pressures to 5000 psig.

Both have removable, 25 ml Teflon cups with convenient closures, long-taper seals and other exclusive Parr features. For details, write or phone: Parr Instrument Co., Moline, Ill. 61265. Telephone 309/762-7716



Circle No. 232 on Readers' Service Card

Antisera

(for immunoassay)

Aldosterone Angiotensin I Angiotensin II Cortisol Deoxycorticosterone Diphenylhydantoin Estradiol Estriol	Estrogen (E ₁ /E ₂) Human Chorionic Somatomammotrophin Human Growth Hormone Insulin Progesterone Prostaglandin F _{2α} Testosterone
--	---

Specific lot data, uses, characteristics, bibliography, and storage information included in our technical folder—yours for the asking.

New England Nuclear

North Billerica, Mass. 01862
 Order Entry: 617-482-9595
 RIA Technical Service: 617-667-2743

NEN Canada Ltd., Lachine, Quebec; NEN Chemicals GmbH, Dreieichenhain, W. Germany.

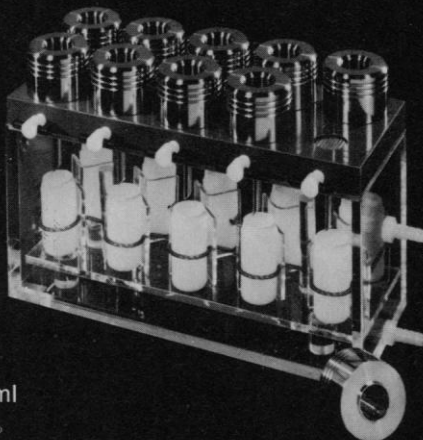
Circle No. 302 on Readers' Service Card

a thing of beauty can last forever

THE HOEFER 10 PLACE MICROANALYSIS FILTER HOLDER

The beauty of this uniquely designed microanalysis filter assembly speaks for itself, and we speak for its speed, efficiency, and durability.

The Hoefer assembly filters 12 ml samples under uniform vacuum pressure in seconds.



Filters are easily centered and sealed instantly without the use of clamps or O rings.

And they don't leak!

For added efficiency and versatility each filter is independently controlled by a separate valve that can be turned off or on or regulated for flow rate at will.

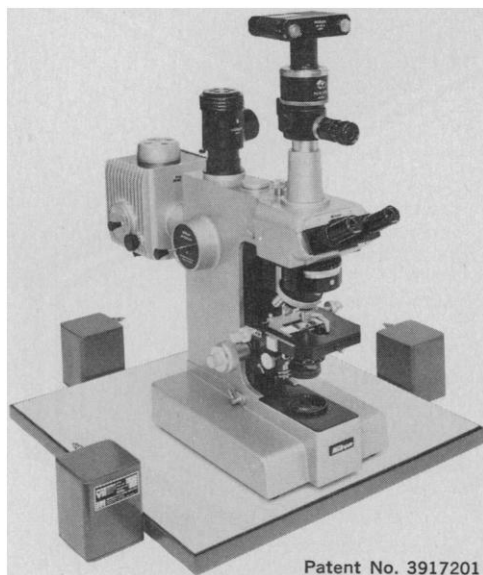
Hand-crafted of 316 stainless steel and PVC to last a lifetime!

Write for further information

HOEFER SCIENTIFIC INSTRUMENTS

650 Fifth St., Box 77387, San Francisco, CA 94107 (415) 495-4410

Low Frequency, Air Mounted Vibration Isolation Systems



Increase the performance efficiency and resolution of sensitive precision instruments in research and in on line production. On location performance guaranteed.

VIT (Vibration Isolation Tables) units are available to accommodate ultramicrotomes, scanning electron microscopes, micromanipulators, mask alignment stations, bonding systems and many other types of sensitive equipment. Our VIT systems are completely self-contained and do not require constant air supply. Table top, console and unique cradle systems are standard items.

Resonant frequency:	Table Top	2 Hz.
	Console	1.5 Hz.
	Cradle	1.1 Hz.

Table top sizes range from as small as 2.75 sq. ft. up to 6.5 sq. ft. Console systems from 8.5 sq. ft. to 17.5 sq. ft. Custom systems to meet special requirements are available. Write for our catalog showing all available configurations.

VIT Department, Nikon Instrument Group, Ehrenreich Photo-Optical Ind., 623 Stewart Avenue, Garden City, New York 11530. (516) 248-5200.



Circle No. 313 on Readers' Service Card

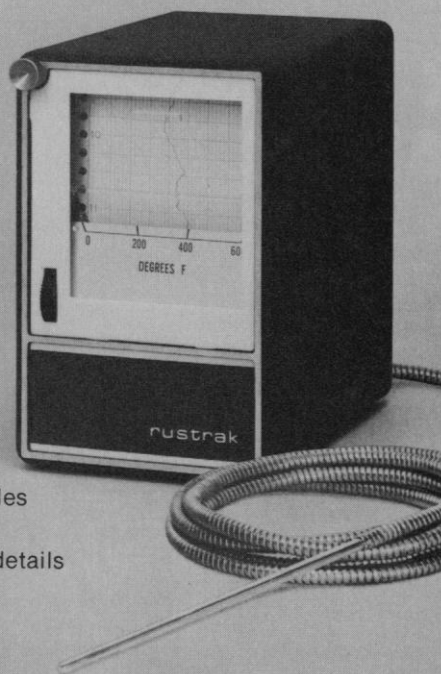
Rustrak miniature temperature recorders

Thermocouple, Thermistor, Resistance Bulb Types.

Ranges and spans to suit practically any temperature measurement application. Sensors available. In stock at your local authorized Rustrak distributor.

Attention OEM's. Custom mounting arrangements, colors, nameplates, chart paper and scales available.

New 32 Page Catalog. Provides details on DC, AC, Temperature, Servo, Multichannel, Event and a variety of special recorder types.



gulton

Measurement & Control Systems Division
Gulton Industries Inc., East Greenwich, Rhode Island 02818
401-884-6800 • TWX 710-387-1500

Circle No. 336 on Readers' Service Card

The Theory of Brillouin Zones and Electronic States in Crystals. H. Jones. North-Holland, Amsterdam, and Elsevier, New York, ed. 2, 1975. xii, 284 pp., illus. \$37.50.

Theory of Molecular Relaxation. Applications to Chemistry and Biology. Francis K. Fong. Wiley-Interscience, New York, 1975. xviii, 314 pp., illus. \$15.95.

The Times Atlas of the World. Comprehensive Edition. Quadrangle (New York Times), New York, ed. 5, 1975. xl, 224 pp. + plates. \$75.

Toward a Science of Man. Essays in the History of Anthropology. Papers from a congress, Chicago, Aug. 1973. Timothy H. H. Thoresen, Ed. Mouton, The Hague, 1975 (U.S. distributor, Aldine, Chicago). xiv, 232 pp. \$14.95. World Anthropology.

Trends in Comparative Endocrinology. Papers from a symposium, Kenya, June 1974. E. J. W. Barrington, Ed. American Society of Zoologists, Thousand Oaks, Calif., 1975. vi, 270 pp., illus. \$12. *American Zoologist* Supplement 1975.

Urban Technology. A Second Primer on Problems. Herbert Fox. Dekker, New York, 1975. xviii, 178 pp. \$16.50. Urban Problems and Urban Technology Series, vol. 2.

Urban Vegetation. A Review and Chicago Case Study. James A. Schmid. University of Chicago Department of Geography, Chicago, 1975. xii, 268 pp., illus. Paper, \$5. Department of Geography Research Paper No. 161.

The Use of Axonal Transport for Studies of Neuronal Connectivity. Papers from a symposium, Gwatt-Thun, Switzerland, July 1974. M. Maxwell Cowan and Michel Cuénod, Eds. Elsevier, New York, 1975. xvi, 366 pp., illus. \$40.95.

The Value of Food. Patty Fisher and Arnold E. Bender. Oxford University Press, New York, ed. 2, 1975. viii, 184 pp., illus. Paper, \$4.25.

A Vector Space Approach to Models and Optimization. C. Nelson Dorn. Wiley-Interscience, New York, 1975. xxii, 600 pp., illus. \$26.50. Wiley Series on Systems Engineering and Analysis.

40. Deutsche Pflanzenschutz-Tagung. Oldenburg in Oldenburg, West Germany, Oct. 1975. Biologische Bundesanstalt für Land- und Forstwirtschaft, Berlin, West Germany, 1975. xvi, 228 pp., illus. Paper, DM 20.

Viral Immunology and Immunopathology. Abner Louis Notkins, Ed. Academic Press, New York, 1975. xii, 484 pp., illus. \$14.50.

War, Its Causes and Correlates. Papers from a conference, South Bend, Ind., Aug. 1973. Martin A. Nettlehip, R. Dalegivens, and Anderson Nettlehip, Eds. Mouton, The Hague, 1975 (U.S. distributor, Aldine, Chicago). xviii, 814 pp., illus. \$39. World Anthropology.

Waterfowl of North America. Paul A. Johnsgard. Indiana University Press, Bloomington, 1975. xiv, 576 pp., illus. + plates. \$25.

The Way the Earth Works. An Introduction to the New Global Geology and Its Revolutionary Development. Peter J. Wyllie. Wiley, New York, 1976. viii, 296 pp., illus. Cloth, \$12.95; paper, \$7.95.

The White Cell. Martin J. Cline. Harvard University Press, Cambridge, Mass., 1975. xii, 564 pp., illus. \$35. A Commonwealth Fund Book.

World Capitals. Toward Guided Urbanization. H. Wentworth Eldredge. Anchor/Doubleday, Garden City, N.Y., 1975. xiv, 642 pp., illus. \$19.95.

World Communications. A 200-Country Survey of Press, Radio, Television and Film. Gower Press, Epping, England, Unesco, Paris, and Unipub, New York, ed. 5, 1975. xviii, 534 pp. \$21.