SCIENCE

20 June 1975

Volume 188, No. 4194

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE







Protein electrofocusing in 1.5 hours

with a thin-layer PREPARED polyacrylamide gel

Now, for the first time, a thin-layer prepared polyacrylamide gel, the Ampholine® PAGplate, is available for electrofocusing of proteins, hormones and enzymes. Samples as low as 10 μ l, and in the microgram range, can be run and complete electrofocusing takes only 1.5 hours.

The Ampholine® PAGplate is an easy to use polyacrylamide gel plate (245 × 110 × 1 mm) containing Ampholine® carrier ampholytes in the pH range 3.5 to 9.5. The Ampholine is used to create the pH gradient in electrofocusing and the protein samples are then focused at their isoelectric points.

No tedious preparation

When you use an Ampholine PAGplate you avoid the tedious preparation and exposure to toxic chemicals involved in do-it-yourself gel plates. No pipettes or complicated sample applicators either. Everything you need for electrofocusing in polyacrylamide gel comes in the complete Ampholine PAGplate kit.

To get the best results, use an Ampholine PAGplate with the LKB 2117-010 Multiphor, complete for electrofocusing in polyacrylamide gel, and the new LKB 2103 Power Supply which gives you constant power, constant current or constant voltage.

For more information on the Ampholine PAGplate and other fine products from LKB for biochemical separations, contact your LKB representative or fill in the coupon below.

YES plea	Se. Mail to: LKI	B Instruments I 21 Parklawn Dri ckville, MD 208
☐ LKB 1804 Ampholine ☐ LKB 2117 Multiphor I ☐ LKB 2103 Power Supp	Electrofocusing Equipment	
Name	Title	
Institution		
Address		
City	State	Zip





The Ampholine® PAGplate can be used complete for 24 samples, or cut in half for 12 samples and in thirds for 8 or 16 samples. The remaining parts can then be stored in the original package in a refrigerator until your next experiment.



Applying your sample is simple and precise with the sample application pieces. Dip, soak for a few seconds in your sample so-lution, and then place on the gel



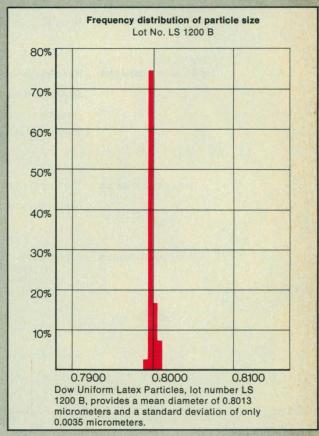
LKB Instruments Inc.

12221 Parklawn Drive, Rockville MD. 20852 11744 Wilshire Blvd. Los Angeles CA 90025 6600 West Irving Park Road, Chicago III. 60634 260 North Broadway, Hicksville N.Y. 11801 3700 Chapel Hill Blvd., Durham N.C. 27707

The Perfect Spherical Shape Of Dow Uniform Latex Particles Makes Them Versatile Enough For... Calibrating instruments

Calibrating instruments
Counting virus particles
Determination of pore size
Agglutination tests
Studies of the reticuloendothelial system
Analysis of flagellate locomotion systems
U.S. National Bureau of Standards
Electrophoresis experiments in space by NASA

The list of uses will continue to grow. These unique particles of specified diameter aid measurement and diagnosis. Their perfect spherical shape and uniformity of size make them suitable for several uses.



For more information on package and particle sizes available, or the uses of Dow Diagnostics Uniform Latex Particles write:

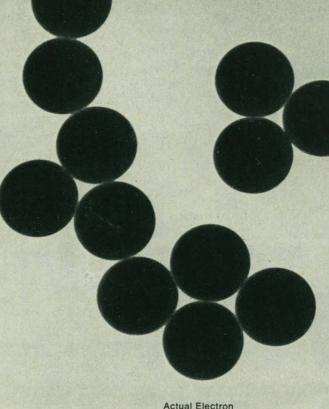


DOW DIAGNOSTICS

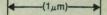
The Dow Chemical Company P.O. Box 68511B Indianapolis, Indiana 46268

Circle No. 518 on Readers' Service Card

Circle No. 510 on Readers Service Card



Actual Electron Photomicrograph of Lot No. LS 1200 B



SCIENCE

LETTERS	Soviet Arrests Continue: L. Bers et al.; Graduate Astronomy Programs: F. C. Michel; Far-Out Diets: T. H. Jukes; AGRIS: H. East; Miles-per-Gallon Indicator: A. T. Moffet.	1164
EDITORIAL	International Cooperation in Geology	1169
ARTICLES	Atmospheric Electrical Detection of Organized Convection: R. Markson	1171
	Membrane Transport: Its Relation to Cellular Metabolic Rates: J. Elbrink and I. Bihler	1177
	What Next in Health Policy?: E. Ginzberg	1184
NEWS AND COMMENT	Kennedy: What Science Is Doing Is Not Enough	1187
	Kennedy Has Rocky in to Talk	1188
	Navy Oceanographic Move: Renewal or Disaster for Basic Research?	1189
	American University in Beirut: Walking a Precarious Line	1191
RESEARCH NEWS	Probing the Tropical Firebox: International Atmospheric Science	1195
	Global Weather Experiment: The Petrodollar Connection	1196
BOOK REVIEWS	Mechanisms in Recombination, reviewed by H. L. K. Whitehouse; Plant Carbohydrate Biochemistry, F. A. Loewus; The Study of Benthic Communities, K. R. Walker; Myriapoda, R. Hoffman; Crop Physiology,	
	R. S. Bandurski; Books Received	1199

BOARD OF DIRECTORS	ROGER REVELLE Retiring President, Chairm	MARGARET MEAD President	WILLIAM D. MC ELROY President-Elect	RICHARD H. B. KENNETH B. C). DADDARIO E. DAVID. JR.
CHAIRMEN AND SECRETARIES OF AAAS SECTIONS	MATHEMATICS (A) Victor L. Klee Truman A. Botts	PHYSICS (B) Victor F. Weisskopf Rolf M. Sinclair	CHEMISTRY (C) William E. Hanto Leo Schubert		ASTRONOMY (D) Carl Sagan Arlo U. Landolt	
	Richard C. Atkinson	SOCIAL AND ECONOMIC SCIEN Seymour M. Lipset Daniel Rich	NCES (K) HISTORY A Roger C. Bu George Basa		OF SCIENCE (L)	ENGINEERING (M) Edward Wenk, Jr. Paul H. Robbins
	EDUCATION (Q) F. James Rutherford Phillip R. Fordyce	DENTISTRY (R) Clifton O. Dummett Sholom Pearlman	PHARMACEUTICAL SCIENC James T. Doluisio Raymond Jang	Ma	FORMATION, COMPUTIN Intin Greenberger seph Becker	NG. AND COMMUNICATION (T
DIVISIONS	William E. Davis Chairman, Executive Com	Irma Duncan mittee Executive Secretary		SION ert T. Orr retary-Treasurer	SOUTHWESTERN AND Joseph A. Schufle 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* 1975 by the American Association for the Advancement of Science. Member rates on request. Annual subscription \$50; foreign postage: Americas \$7, overseas \$8, air lift to Europe \$30. Single copies \$2 (back issues \$3) except Food Issue (9 May 1975), is \$3 and Guide to Scientific Instruments is \$6. School year subscription? 9 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

Volcanic Eruptions: Contribution to Magnetism in Deep-Sea Sediments Downwind from the Azores: W. K. Freed and N. D. Watkins	1203
Structure of Coat Proteins in Pf1 and fd Virions by Laser Raman Spectroscopy: G. J. Thomas, Jr., and P. Murphy.	1205
Denudation Studies: Can We Assume Stream Steady State?: S. W. Trimble	1207
Weyl's Theory of Glaciation Supported by Isotopic Study of Norwegian Core K 11: J. C. Duplessy, L. Chenouard, F. Vila	1208
Intercalation of Metallocenes in the Layered Transition-Metal Dichalcogenides: M. B. Dines	1210
Ganymede: Observations by Radar: R. M. Goldstein and G. A. Morris	1211
Chronotypic Action of Theophylline and of Pentobarbital as Circadian Zeitgebers in the Rat: C. F. Ehret, V. R. Potter, K. W. Dobra	1212
Flavonoids as Inhibitors of Lens Aldose Reductase: S. D. Varma, I. Mikuni, J. H. Kinoshita	1215
Antipsychotic Drugs: Direct Correlation between Clinical Potency and Presynaptic Action on Dopamine Neurons: P. Seeman and T. Lee	1217
Golgi Complex – Endoplasmic Reticulum Transition Region Has Rings of Beads: M. Locke and P. Huie	1219
Technical Comments: Origin of Horizon A: Clarification of a Viewpoint: T. G. Gibson and K. M. Towe; F. M. Weaver and S. W. Wise, Jr	1221
Poly(ADP-ribose): Polynucleotide Still without a Function: M. Smulson; Organotransition-Metal Chemistry: Y. Ishii and M. Tsutsui; Polyunsaturated Fatty Acids: J. F. Mead	1223
Blood Glucose Analyzer; Pipette Tip-Loading System; Ionized Calcium Analyzer; Hematology Standard; Disposable Thermometers; Blood and Tissue pO ₂ Monitor; Cyclic Adenosine Monophosphate Assay; Peroxidase-Conjugated Antisera; Thyroxine Radioimmunoassay; Literature	1228
	Structure of Coat Proteins in Pf1 and fd Virions by Laser Raman Spectroscopy: G. J. Thomas, Jr., and P. Murphy. Denudation Studies: Can We Assume Stream Steady State?: S. W. Trimble Weyl's Theory of Glaciation Supported by Isotopic Study of Norwegian Core K 11: J. C. Duplessy, L. Chenouard, F. Vila Intercalation of Metallocenes in the Layered Transition-Metal Dichalcogenides: M. B. Dines Ganymede: Observations by Radar: R. M. Goldstein and G. A. Morris Chronotypic Action of Theophylline and of Pentobarbital as Circadian Zeitgebers in the Rat: C. F. Ehret, V. R. Potter, K. W. Dobra Flavonoids as Inhibitors of Lens Aldose Reductase: S. D. Varma, I. Mikuni, J. H. Kinoshita Antipsychotic Drugs: Direct Correlation between Clinical Potency and Presynaptic Action on Dopamine Neurons: P. Seeman and T. Lee. Golgi Complex—Endoplasmic Reticulum Transition Region Has Rings of Beads: M. Locke and P. Huie. Technical Comments: Origin of Horizon A: Clarification of a Viewpoint: T. G. Gibson and K. M. Towe: F. M. Weaver and S. W. Wise, Jr. Poly(ADP-ribose): Polynucleotide Still without a Function: M. Smulson: Organotransition-Metal Chemistry: Y. Ishii and M. Tsutsui; Polyunsaturated Fatty Acids: J. F. Mead Blood Glucose Analyzer: Pipette Tip-Loading System; Ionized Calcium Analyzer; Hematology Standard; Disposable Thermometers; Blood and Tissue pO:

RUTH M. DAVIS WARD H. GOODENOUGH

FREDERICK MOSTELLER CHAUNCEY STARR

WILLIAM T. GOLDEN Treasurer

WILLIAM D. CAREY Executive Officer

GEOLOGY AND GEOGRAPHY (E)

William E. Benson

Ramon E. Bisque

BIOLOGICAL SCIENCES (G)

Hans Laufer

Jane C. Kaltenbach

MEDICAL SCIENCES (N) Robert Austrian Richard J. Johns

STATISTICS (U) Carl A. Bennett Ezra Glaser

AGRICULTURE (0) Paul E. Waggoner J. Lawrence Apple

ATMOSPHERIC AND HYDROSPHERIC SCIENCES(W) Charles E. Anderson Stanley A. Changnon, Jr.

ANTHROPOLOGY (H) Ruth L. Bunzel Philleo Nash

INDUSTRIAL SCIENCE (P) Jordan D. Lewis Robert L. Stern

GENERAL (X) Athelstan F. Spilhaus Joseph F. Coates

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.

COVER

Aircraft used in atmospheric electrical research for detection of organized convection (top left). The vertical electric field was measured between radioactive probes above and below the left wing tip. Much of the data were gathered during extended duration passes 5 meters above the ocean (bottom left). Layers of positive space charge exist at the top of the atmospheric haze layer (right) and within 150 meters of the ocean. See page 1171. [B. J. Kaplan, Newton, Massachusetts]

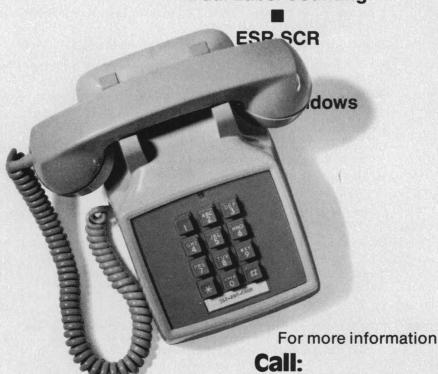
NEW Searle Analytic Liquid Scintillation

Counter

For under \$9000.00*

300 Samples

Dual Label Counting



EAST

Flushing, NY

Mike Nobles

Dave Zimmerli

212-445-7550 Colonia, NJ Elmer Lucas 201-388-3150 Rochester NY Brian Parker 716-442-2430 Philadelphia, PA Tony Anello Frank Toto 215-923-4818 Washington, DC Raoul Benoit Nathan Kight 301-622-3993 Boston, MA Hi Hansen

Tom Cain

Ken Stella

617-861-7500

SOUTH Dallas, TX **Bob Brewster** 214-438-2636 Atlanta, GA Al Robertson 404-451-6251 Miami, FL Barry Weisner 305-681-4624 Houston, TX Larry Wetterschneider 713-784-4577 Durham, NC Pete Bushong 919-471-3402 New Orleans, LA Larry Wetterschneider 504-888-7955

MIDWEST

Andy Teter

Tom Lange

612-646-6388

312-956-0390

Minneapolis, MN

WEST Cleveland, OH San Diego, CA Bill Cockrell 714-279-9340 Norm Goldman 216-333-4355 Detroit, MI Los Angeles, CA Bill Doody 213-240-7100 Bill Stringer 313-557-5743 Denver, CO Cincinnati, OH Ed Zurmuhlen Dave Cowles 303-825-3255 513-931-9100 St. Louis, MO San Francisco, CA Allan Schultz Steve Hickman 314-434-6200 415-444-0553 Chicago, IL Seattle, WA Tom Haege John Lason Dave Hansen 206-632-5313

SEARLE

Searle Analytic Inc.

Subsidiary of G.D. Searle & Co. 2000 Nuclear Drive Des Plaines, IL 60018

IN CANADA:

Searle Instrumentation
Division of G.D. Searle & Co. of Canada, Ltd.
400 Iroquois Shore Rd.
Oakville. Ont. L6H1M5

1154

^{*}Prices may differ outside the U.S.A.

Peel and use.

Our Nalgene® Filter Unit comes sterilized in a sealed plastic bag, ready to peel and use.

There's no preparation or handling of membranes.

And it's disposable so there's no cleaning or autoclaving.

It now gives you a choice of 3 membrane filters: 0.20, 0.45 and 0.80 micron. The new 0.80 size is ideal for removing and collecting yeast,

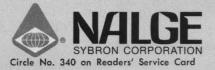
clean-room air sampling and reducing bacterial count in beverage samples. We've also added graduations to the 115 ml suction flask.

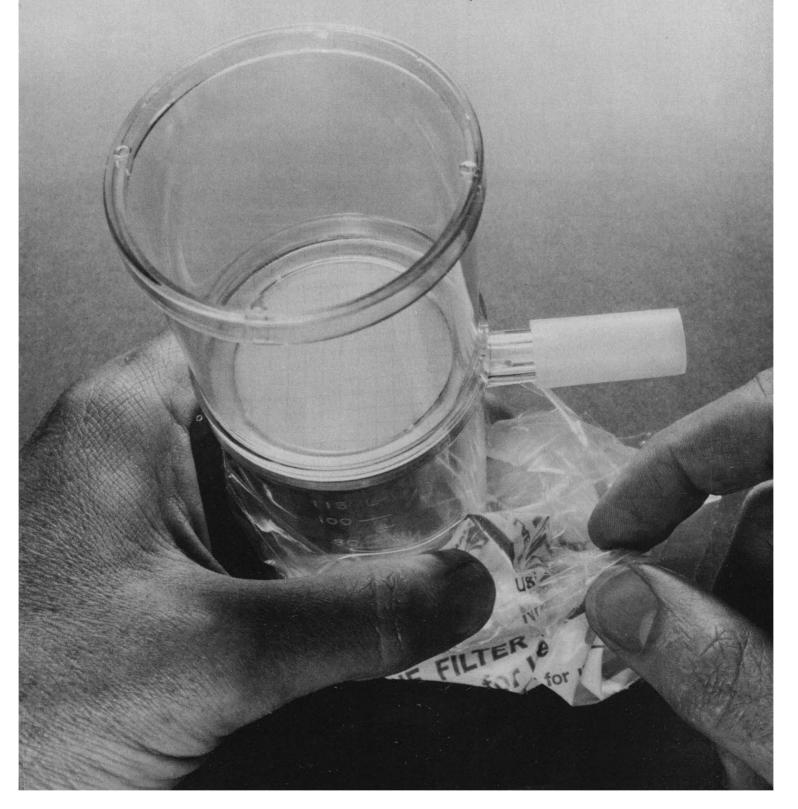
You'll like the simple one-piece design that reduces contamination hazard. And you'll save money by eliminating cleaning, preparation and sterilization needed with ordinary units.

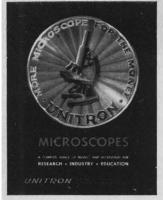
Disposal is easy. Just incinerate when you're through with it.

It's available off-the-shelf from your

lab supply dealer in packages of 12 or cases of 72. (Ask about case discounts.) For our catalog and a detailed brochure about our filter unit, write Nalgene Labware Division, Box 365, Rochester, N.Y. 14602.



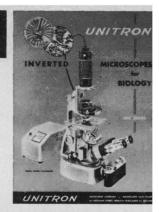




FREE MICROSCOPE BUYING GUIDE

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

A UNITRON MICROSCOPE CATALOG is Yours for the Asking.















ASK FOR YOUR FREE MICROSCOPE BUYING GUIDE

- Review our complete catalog.
- See the wide variety of microscopes and accessories that we offer to meet your needs.
- Demonstration and personal attention at your request, arranged through local dealers.

UNITRON SCIENTIFIC, INC. • 66 Needham St. • Newton Highland, MA 02161















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

Name

Company

Address

City

State

Zip

Circle No. 517 on Readers' Service Card



66 NEEDHAM STREET NEWTON HIGHLANDS MASSACHUSETTS 02161



Tektronix cuts the wait for 19"Graphics.

And cuts \$900 off hard copier costs.

Two special deliveries: rapid turn-around on 4014-1 orders, and a better hard copier for 20% less.

In more ways than one, Tektronix' 4014-1 Graphic Computer Terminal is one of the biggest draws in graphics. At 19", it displays up to three times the normal data load. In popularity, the performanceproved 4014-1 was outdrawing our production capacity.

Now 4014-1 production has been geared up to assure rapid turnaround between order and arrival.

> The size, speed and interactivity of the 4014-1 lops days off data processing. At \$9995,*

terminal of its kind in the industry.

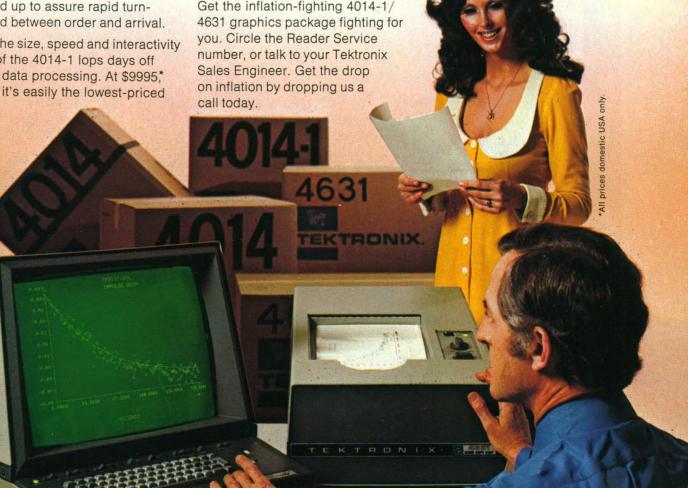
And now, the low-cost 4631 comes to the big screen. You can save 20% with the latest development in low-cost hard copy units. Our new 4631 delivers greater reliability and more capabilities than ever before. Its \$3895 price includes simplified circuitry, "fliptop" maintenance and immediate compatibility with the 4014-1 and our other terminals.

Get the inflation-fighting 4014-1/ 4631 graphics package fighting for you. Circle the Reader Service number, or talk to your Tektronix Sales Engineer. Get the drop on inflation by dropping us a

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



Circle No. 429 on Readers' Service Card



TO MEET YOUR NEEDS MOUND LABORATORY EXPANDS ITS

SULFUR-34

STABLE ISOTOPE INVENTORY

To meet the investigators stable isotope needs in the fields of environmental control biology, medicine, and pharmacology, we offer the stable isotope SULFUR-34 in the form of carbon disulfide and sulfur dioxide at enrichments of 90+%. Recent process improvements at Mound Laboratory now permit a significant reduction in the unit selling price. SULFUR-34 will be available at less than \$200 per gram.

For additional information concerning SULFUR-34 and our complete line of stable isotopes, write or call for your free catalog.

Monsanto MOUND LABORATORY

Monsanto Research Corp.
P.O. Box 32
Miamisburg, Ohio 45342 U.S.A.

Stable Isotope Sales (513) 866-7444 TWX 810-473-2974

Mound Laboratory is Operated for The United States Energy Research and Development Administration U.S. Government Contract No. AT-33-1GEN-53

giving information on the application and practical use of Philips X-ray diffraction equipment, X-ray spectrometers, emission spectrometers, electron microscopes, X-ray microanalyzers, nuclear equipment neutron generators, electro-chemical leasuring equipment, gas chromatographs

analytical equipment

Issued by: ANALYTICAL EQUIPMENT DEPARTMENT, N.V. PHILIPS' GLOEILAMPENFABRIEKEN, EINDHOVEN, THE NETHERLANDS

Rapid processing of kidney biopsies for electron microscopy

by Jan Vincents Johannessen The Gade Institute, Department of Pathology and Laboratory for Clinical Electron Microscopy, University of Bergen, 5000 Bergen, Norway.

The widespread use of kidney biopsy has ated by electron microscopy. Light microscopy contributed to the explosive expansion of clinical nephrology in the last 20 years. 1-3 This is now an established procedure in the response to therapy differ, cannot be dis- species. 10-14 tinguished clinically.5,6 Their lesions may have an almost identical appearance on light micro-

is, therefore, not an entirely reliable means of differentiating renal lesions, 5,7-9

A major obstacle to the use of electron microinvestigation and management of patients with scopy in the routine evaluation of kidney kidney disease and the only method of making biopsies has been the long processive time that an exact and morphological evaluation of dif- is usually employed. However, rapid methods fuse renal disease during life.4 Several forms of have been successfully used in electron microkidney disease in which the prognosis and scopy of normal tissues from different animal Therefore, the aim of the present study was to adapt and evaluate a rapid method of preparation of kidney biopsies for scopy^{3,6}, although they are readily differenti- electron microscopy. The quality of the sec-

From the Philips' Bulletin, about the EM201 Philips no nonsense. high throughput electron microscope. Circle the number below, we'll be glad to send you the complete Bulletin.



Uniquely simple to operate. Any staff member, with only a few minutes instruction can make a micrograph of the highest quality.

Uniquely simple to install. Ready for vacuum when it arrives, the EM201 can be prepared for use the same day.

Field report. literature. demonstration:

write or call Don Rodgers. Product Manager, Electron Optics.

914-664-4500

ELECTRONIC INSTRUMENTS

A North American Philips Company 750 South Fulton Avenue Mt. Vernon, NY 10550



new... informative... thought-provoking...

A carefully selected group of audiotapes from the 1975 AAAS Annual Meeting is now available! Whether or not you attended the meeting, you will find these recordings an excellent addition to your listening library, presenting timely discussions in such critical areas as environment and ecology . . . land use, food production, and human population . . . energy and transportation . . . urban policy and planning . . . health policy and research . . . understanding human behavior . . . Check the list of available cassettes for topics that may be of special interest to you.

SCIENCE

... and human imagination

189-75 Information Technology and Individual Privacy (I). Status report on the convergency of law with science and technology in the area of individual privacy.

201-75 New Ideas Toward Metric Conversion for the Public (II only). The implications of a change to the metric system and the effects of such a change on everyday activities.

... and human environment

190-75 The Future of Cars: Energy, Environment, and Economics (I-IV). A discussion of auto-emission, power-plant and energy options, including near-term (1976-1980), medium-term (1980-2000), and long-term alternatives. Regulatory aspects also are discussed.

195-75 **Food, Population, and the Environment** (I-III). A discussion of the complex strategy of food research and management, indicating the need for an increase in the absolute levels of food, feed, and fiber (our renewable resources) with the most efficient utilization of nonrenewable resources.

196-75 **Energy and Societal Development** (I). AAAS Public Lecture by Chauncey Starr (President, Electric Power Research Institute, Palo Alto, California).

197-75 Electrical Responses of Plants to External Stimuli (I). An exploration of what is known about "primary perception" in plants and a look at recent claims that plants respond electrically to human thoughts and emotions.

200-75 **The Food-Energy Relationship** (I). A look at some questions of national and global interest and policy that are affected by the interrelationship of food and energy problems, and the impact of this relationship of U.S. foreign policy.

1160 SCIENCE, VOL. 188



202-75 Are There Thresholds in the Effects of Pollutants on Health? (I). A discussion of the need for restrictions to insure a reasonable level of pollutants consistent with health levels of a variable population, and ways to establish such restrictions.

. . . and human health

191-75 **Aging and Quality of Life** (I). A look at the quality of life in the later years as it may be associated with social, environmental, and behavioral variables, and the relationship of these variables to survival into the later years.

192-75 Application and Misapplication of Findings in Parapsychology (I). A review of the difficulties, both theoretical and practical, that have arisen with basic research in this area, a discussion of research that shows some promise of eventual applicability, and a look at the concept of teaching psychic ability.

198-75 **Genetics and Humanity** (I-II). Focuses on a number of social and ethical problems which the recent rapid increase in our knowledge of genetics has made quite pressing — the rights of individuals and the needs of society relative to genetic screening; the plight of the carrier of genetic defects; the implications of genetic engineering.

204-75 **Perceptual Systems: Images, Hallucinations, and Dreams** (I). Discussions among psychoanalysts and psychologists working with perceptual and fantasy-image formation.

... and the metropolis

193-75 **Urban Medical Problems** (I). Reports on major medical problems of urban communities, including alcoholism and drug abuse; also discusses the availability of care for acute health problems and the cost of hospital care.

194-75 **Primary Health Care in the Urban Community** (I). The availability, quality, and cost of medical and health care in urban communities is reviewed. Contemporary programs are discussed and future directions of the federal government, city health departments, private-prepaid group practices, medical schools, and foundations are also reviewed.

199-75 **The City and the Sea** (I). Discusses the complex relations between sea and city, as well as the unique situations and problems of maritime cities. Five case histories are presented.

[The hyphenated numbers preceding the symposium titles identify each title by tape number (preceding the dash) and by year of taping (after the dash). Roman numerals following the titles designate the number of sessions in each symposium.]

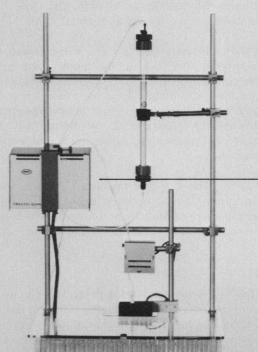
Prices: Single session symposium, \$19.95

Multi-sessions, \$19.95 for first session; \$16.95 for each additional session of the same symposium.

Approximate length of a single session is 3 hours.

Tape No	Session No.	Tape No	Session No
Tape No	Session No.	Tape No	Session No
Check or money (payable to AAAS		Please bill me (subject to \$1.50 hand	dling charge)
	Allow 3	to 4 weeks for delivery.	
NAME			
ADDRESS		The state of the s	/
CITY		STATE	ZIP CODE_
0111			
	Please send me a comp	lete listing of AAAS audiotape	S.

4 ways to upgrade your LIQUID CHROMATOGRAPHY SYSTEM.



FRACTO-SCANTM

This double beam photometer measures UV absorbing components with unmatched sensitivity. It provides direct linear recording of absorbance values with automatic sample/reference baseline compensation. A separate control unit houses the electronic circuitry, allowing more flexibility in positioning the optical unit.



MULTI-STALTIC PUMP®

This peristaltic action pump is available with four or eight veins. Variable speed designed for accurate metering, sampling, layering, transfer and withdrawal of liquids.

FRACTOMETTE® ALPHA 200

Complete for time, drop and volume modes of collection, our most recent model has a 200 tube capacity, yet occupies less than 1¼ sq. ft. It features 100% solid state circuitry, a lift-off collection platform, an electronic digital display and "LiquiFuse" — a unique overflow detection device.

RECORDER 3-5200

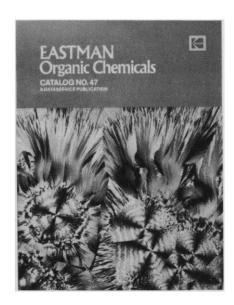
Our single channel, null-balance recorder provides an easy to read 10" chart width with four speeds of operation. The heart of the instrument is a fast responding linear servo motor with only a single moving part. An event marker pen completes the unit for a variety of monitoring applications.

SEARLE

Buchler Instruments

Division of Searle Analytic Inc. 1327 Sixteenth Street Fort Lee, New Jersey 07024 The equipment shown here is just a sample of the Buchler line currently available for biochemical research and clinical laboratories. If you'd like to know more about our instruments and their many applications, write to us. You may find we can make a real contribution to your work.

Eastman Torganic Chemicals Chemicals



EASTMAN Organic Chemicals Catalog No. 47

Featuring:

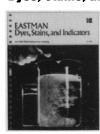
- 332 pages of data on nearly 6,000 EASTMAN Organic Chemicals.
- Structural formulas illustrated for more than 1,000 of the chemicals.
- An index of empirical formulas.
- A functional group listing.
- Color coding on all pages to help you quickly find what you need.
- Reader-service postcards enabling you to request additional literature, quotes on bulk and custom chemicals, and other information.

For your own personal copy, request Kodak Publication No. JJ-1.

Circle No. 479 on Readers' Service Card

If your needs are very specific, perhaps you also need one of these product listings for a particular application.

Dyes, stains, and indicators



EASTMAN Dyes, Stains, and Indicators, Kodak Publication No. JJ-196, is a new EASTMAN Dataservice Catalog to assist you in locating the many dyes, stains, and indicators available from Eastman Organic Chemicals. The product listing is divided into the following categories:

- Adsorption Indicators
- Biological Dyes and Stains
- Buffers
- Chelatometric Indicators
- Colorimetric Indicators
- Cyanine Dyes and Spectral Sensitizers
- Fluorometric Indicators
- Functional Group Determination Reagents
- Organic Laser Dyes and Phthalocyanine-Type Compounds
- Redox Indicators

Use the coupon below to request your copy of JJ-196 and we'll also include a copy of the popular, colorful wall chart, pH Ranges and Color Changes of EASTMAN Indicators.

Circle No. 480 on Readers' Service Card

Tools for synthesis



EASTMAN Tools for Synthesis, Kodak Publication No. JJ-195, is a quick reference to reagents commonly used in laboratory and industrial synthesis that are available from Eastman Organic Chemicals. The "Tools for General Organic Synthesis" section is divided into 105 categories listing reagents for chemical reactions (acetylation, etc) and chemical types (acid chlorides, etc).

Also included are separate listings of: ligands for organometallic synthesis, organometallic and complex salts, reagents for polymer synthesis, and reagents for functional group determination. Request Kodak Publication No. JJ-195.

Circle No. 481 on Readers' Service Card



Eastman Kodak Eastman Organ Dept. 412-L		6-4
Rochester, N.Y.	. 14650	
	ollowing: NN Organic Chemicals Catalog I MAN Tools for Synthesis	No. 47
	MAN Dyes, Stains, and Indicator	rs
		rs ————
JJ-196, <i>EASTI</i>		rs
JJ-196, EASTI		rs

New Ampholytes from Bio-Rad

New Bio-Lyte[®] carrier ampholytes for isoelectric focusing are now available from stock in one wide working pH range (Bio-Lyte 3/10) and in six narrow pH ranges, Bio-Lyte 3/5, 4/6, 5/7, 6/8, 7/9 and 8/10. (The product designations are indicative of the working pH range.)

Made of polyamino-polysulfonic acid, the Bio-Lytes are ideal for use with a polyacrylamide gel as the stabilizing medium, either by substituting directly for the ampholytes you are now using, or by following the suggested formulations in Bio-Rad's Bulletin 1030 or in the instructions that accompany each Bio-Lyte shipment.

Bulletin 1030 has all the details, including pH profiles, actual separations and complete pricing. It also contains information on the new Gel Pro-pHiler described below.

Gel Pro-pHiler

With the new Gel Pro-pHiler, miniature pH electrodes and a pH meter, you can take accurate pH readings every 5 mm along the entire gel length. No more gel slicing and soaking.

The Bio-Rad Gel Pro-pHiler

holds a cyclindrical gel in position so you can measure the pH profile of a gel as soon as it is removed from its tube. When you are finished, the gel emerges virtually undamaged and ready for staining.

If you are using isoelectric focusing, or if you suspect you should be, then write for Bulletin 1030. You'll find everything you need for this proven method of separating proteins.

*BIO·RAD Laboratories

32nd and Griffin Avenue Richmond, CA 94804 Phone (415) 234-4130

Also in: Rockville Centre, N.Y.; Mississauga, Ontario; London; Munich; Milan; Sao Paulo

Circle No. 449 on Readers' Service Card

LETTERS

Soviet Arrests Continue

The Soviet physicist Andrei Tverdokhlebov has been arrested. In 1970, he, together with A. Sakharov and V. Chalidze, founded the Moscow Human Rights Committee. More recently he became the secretary of the Soviet group of Amnesty International. The biologist S. Kovalev, another member of this group, was arrested last December.

Sakharov and Shasarevich (a distinguished Moscow mathematician) applied for the release of these men. In an "Appeal to American scientists" Chalidze wrote:

... these repressions involve serious scientists who, despite their public activity and pressure from the regime, have continued scientific work ... persecuted Soviet scientists have no defense other than to hope for the support of the international scientific community.

We initiate the creation of a Scientists' Committee for Tverdokhlebov. Interested colleagues are asked to write to one of us.

LIPMAN BERS

Department of Mathematics, Columbia University, New York 10027

OWEN CHAMBERLAIN

Department of Physics, University of California, Berkeley 94720

Marvin Goldberger

Department of Physics, Princeton University, Princeton, New Jersey 08540

MARK KAC

Department of Mathematics, Rockefeller University, New York 10021

Graduate Astronomy Programs

The recent recommendation by the National Academy of Sciences' Astronomy Manpower Committee to discourage graduate education in astronomy was reported in the 18 April issue of Science (Research News, p. 246). It is clear from reading the full report (1) that the intentions of the committee were good. Nevertheless I feel that, as chairman of a department that carries the name of astronomy, I must register my disagreement with that recommendation.

First, the recommendation may backfire. If the graduate program is reduced, so is need for faculty to maintain that program. With the present strong financial pressures on colleges and universities, the total faculty pool may well be cut. Thus the recommendation threatens to set off a vicious cycle that will exacerbate, not abate, the shrinking job market.

Second, a problem exists only if astronomy programs are set up to produce narrow specialists who are unfit, at least psychologically, for any other work. In that case the problem lies in those programs and not in the trivially obvious fact that one cannot have zero population growth in a population that attempts to replicate itself once every year or two. The solution we have adopted is to create a broader interdisciplinary approach so that a degree in astronomy does not restrict its recipient to work only as an astronomer. A few of the best and the luckiest remain in astronomy. The others are able, and feel that they are able, to use their ability and training in problem-solving in the physical sciences to work productively in government or industry. Our graduates are all finding good, useful jobs in which they are successful. They are not overly concerned that these jobs often do not involve a simple extension of their thesis research. There are undoubtedly other approaches to the problem, but the interdisciplinary one has worked well at Rice University.

F. CURTIS MICHEL

Department of Space Physics and Astronomy, Rice University, Houston, Texas 77001

References

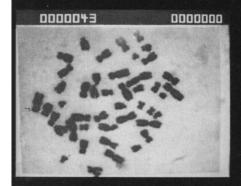
 Astronomy Manpower Committee, Committee on Science and Public Policy, Employment Problems in Astronomy (National Academy of Sciences, Washington, D.C., 1975).

Far-Out Diets

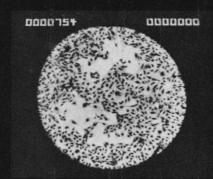
The Point of View "Stamp out food faddism" (News and Comment, 16 May, p. 714) is a curious mixture of emotion and inaccuracy. It says that "[o]ur far-out diet-almost 20 percent refined sugar and 45 percent fat—is new to human experience." New indeed, as anyone who has ever mixed or analyzed a laboratory diet could tell the anonymous author. American diets commonly supply about 42 percent of food energy as fat (1). Fat has a caloric content 2.25 times that of carbohydrate or protein, so this is equivalent to 25 percent, not 45 percent, of the diet, not counting roughage and minerals, which bring the fat content down to 20 percent or

The author implies that our great-grandparents ate diets of raw broccoli, wheat germ, and yogurt, but does not mention

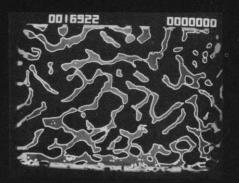
Cells, petri dishes, micrographs . . . virtually any biomedical specimen analyzed automatically at high speed.



CHROMOSOME ANALYSIS. spreads automatically located and recalled for analysis.



TARGET CELLS COUNTED IN TISSUE CULTURES. Cell preparations can be quantitated using slides or culture trays.



QUANTITATIVE ASSESSMENT OF BONE STRUCTURE. Perimeter measurement of trabecular bone.

THE QUANTIMET 720 SYSTEM COUNTS, MEASURES AND CLASSIFIES FEATURES BY SHAPE, OPTICAL DENSITY, AREA, PERIMETER, LENGTH AND WIDTH.



The Quantimet 720, by offering a wide selection of automated image analysis capabilities, enables the scientist to perform sophisticated, reproducible and accurate measurements at speeds up to 1,000 times faster than by conventional methods.

Selected features of both micro and macro specimens can be counted, measured, analyzed and classified according to shape, area, perimeter, density, length, width or other criteria you im-

pose. High speed frequency distributions and integrated optical density measurements, difficult to obtain by other means, are quickly obtained by the Quantimet 720 with exceptional accuracy.

A video screen displays the specimen being analyzed and identifies those features conforming to preselected criteria. Measurement results are displayed in digital form above the video screen. Desktop calculators and minicomputers can be interfaced with the Quantimet 720 to provide further statistical analyses and graphic presentations.

The Quantimet 720 is the most accurate instrument of its type presently available, and its modular design makes it the most versatile as well. A variety of plug-in modules are available so you can select a system which not only meets current requirements but can be easily expanded to meet future needs. Your Quantimet 720 will never be obsolete because of lmanco's continuing development and introduction of new modules to increase system capabilities. For more information, contact Image Analysing Computers, Inc., 40 Robert Pitt Drive, Monsey, N.Y. 10952. Telephone: (914) 356-3331.

INPUT PERIPHERALS AND INTERFACES

FROM CINE AND SLIDE FILMS

- Cineangiography—dynamic organ studies
- Biological growth rates
- Particle motion tracking
- Serial micrographs

FROM PETRI DISHES

- Inhibition/exhibition zone measurements in research and quality control.
- Colony counting and size distribution analyses.

FROM OPTICAL MICROSCOPES

- Measurements of cells, tissue sections, culture plates and autoradiographs.
- Automatic x-y specimen handling and automatic focusing for complete slide coverage.

FROM TRANSMISSION AND SCANNING ELECTRON MICRO-**SCOPES**

 On-line image analysis with direct optical and electronic interfaces. . . eliminates photographic processing.

FROM MACRO SPECIMENS

 Photographs, negatives, x-rays, large particulates, lung and brain sections, and other macro specimens can be analyzed directly with an epidiascope imaging system.



IMANCO Image Analysing Computers, Inc.

A METALS RESEARCH GROUP CORPORATION

From Amersham/ Searle labelled narcotics and related compounds

[Classified by the DEA as exempt chemical preparations. BNDD forms not required.]

CFA.401
CFA.544
TRK.444
TRK.448
CFA.421
TRK.449
TRK.450
TRK.476
CFA.534
TRK.461
TRK.447
CFA.363
CFA.537
CFA.538
TRK.446
SJ.77

For complete ordering information, consult your new Amersham/ Searle Research Products Catalog Call or write:



2636 S. Clearbrook Drive/Arlington Heights, Illinois 60005 Telephone, Toll free: 800-323-9750---Telex: 28-2452 In Illinois, Alaska, Puerto Rico, & Hawaii: 312-593-6300 400 Iroquois Shore Road/Oakville, Ontario Telephone: 416-844-8122-Telex: 069-82216 R757012

Circle No. 339 on Readers' Service Card

that their life expectancy was less than ours. Actually, the rejection of saturated fats is a recent fashion; our great-grandparents were great consumers of butter, cream, fat pork, lard, suet, and beef drippings. They ate starch, which, like refined sugar, is converted to glucose in vivo. If they ate broccoli, they had enough sense to cook it so it would be digestible. Wheat germ is a great food, even though it contains an estrogen that gives it a potency equivalent biologically to about 400 parts per billion of diethylstilbestrol as measured by the mouse uterine response (2). Yogurt is milk is yogurt. It is easy to use the term "junk food" in a subjective manner.

The statement that the "standard" diet "can contribute to obesity, tooth decay, heart disease, intestinal cancer, and diabetes" is an erroneous oversimplification. These are complex problems, involving heredity, hormonal balance, fluoride deficiency, dental hygiene, and even virus diseases. Overeating is paramount to obesity, but, alas, the degenerative diseases will not be arrested by going on a diet of cracked wheat, pumpkin seeds, and dried seaweed.

THOMAS H. JUKES

Space Sciences Laboratory and Department of Nutritional Sciences, University of California. Berkeley 94720

References

1. Committee on Dietary Allowances, Food and Nutrition Board, National Research Council, Recommended Dietary Allowances (National Academy of Sciences, Washington, D.C., ed. 8, 1974), p. 33.

A. N. Booth, E. M. Bickoff, G. M. Kohler, Science

AGRIS

One rather unfortunate misunderstanding might arise from the otherwise excellent article "AGRIS" by Joseph F. Caponio and Leila Moran (24 Jan., p. 233). In the section entitled "Discussion," the authors state, "AGRIS represents the first big international effort to coordinate and to consolidate a spectrum of information activities." This does less than justice to the work of the International Atomic Energy Agency (IAEA) and its member states in their creation of the International Nuclear Information System (INIS).

INIS came into operation in May 1970 and was the world's first computer-based documentation service for which input is prepared on an internationally decentralized basis. The first discussions in the IAEA secretariat, which ultimately led to the implementation of INIS, were initiated by the United States and the Soviet Union in the summer of 1966. R. K. Wakerling of the United States and L. L. Issaev of the Soviet Union, acting as consultants, drew up the first description of the system. Their report was reviewed in December of that year by a working group consisting of experts from 16 countries and three international organizations. Agreement was reached in 1966 on a number of important aspects of INIS which have endured through subsequent years.

In particular, it was decided to adopt a "network" concept for the organization of INIS. Each country or regional organization would scan the literature for the area for which it was responsible and prepare the input data for the system; the IAEA would merge this data to create a master file and would distribute the file in agreed forms (conventional printing, microform, and magnetic tape) for the use of national and regional information services.

INIS is now a well-established and highly efficient system. It has demonstrated that a system based on decentralized input can produce timely and consistent information services.

It may be of some interest to note that the implementation of the AGRIS Level One system—which became operational this year—has been achieved in close collaboration with INIS, making use both of the experience and computer software of the latter system. Further, all computer processing of AGRIS input is being performed as a joint operation with the computer section of the IAEA in Vienna. That this collaborative effort is working smoothly is a further tribute to INIS "know-how."

HARRY EAST

AGRIS Coordinating Centre, Food and Agriculture Organization of the United Nations, Q0100-Rome, Italy

Miles-per-Gallon Indicator

In his review of energy conservation (Research News, 23 May, p. 820), William D. Metz should have used the indicative rather than the subjunctive mood in referring to a miles-per-gallon indicator for automobiles. Such an instrument has been available for some time from SpaceKom, Inc., a small company in Santa Barbara, California. It costs about as much as 70 gallons of gasoline.

ALAN T. MOFFET

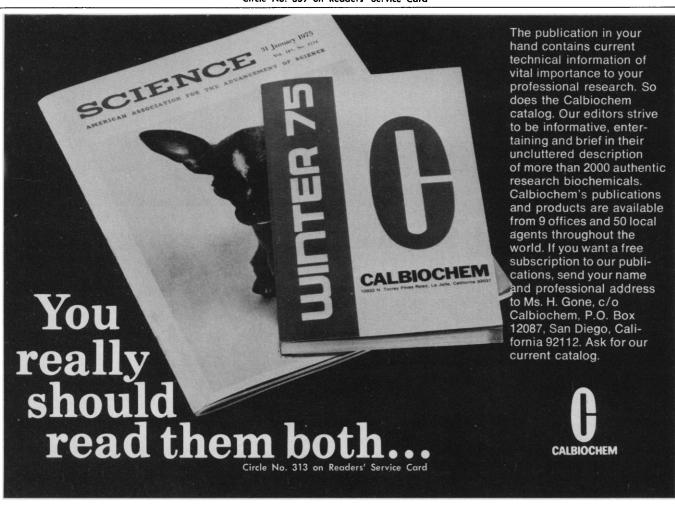
Owens Valley Radio Observatory, California Institute of Technology, Pasadena 91125

SCIENCE, VOL. 188



Circle No. 359 on Readers' Service Card

20818 Bausch Street, Rochester, New York 14602





A DEPENDABLE SOURCE...for your laboratory needs!

Just like the old country store where everything from food to clothing to hardware could be purchased, and where many of its wares were cluttered outside for display purposes, we serve as a dependable source for your laboratory needs — from costly, sophisticated instruments to items that sell for mere pennies.

Pictured in the recreated scene in front of the store are a few of the many thousands of items we stock . . . produced by over 200 prominent manufacturers in our field. And just as the old country store could be relied on for service, we, too, pride ourselves on maintaining large amounts of stock for prompt delivery to points both here and abroad.

The next time you are in the market for laboratory equipment or supplies, we would like an opportunity to serve you. To learn more about our facilities, why not send for our booklet entitled "This is SGA?"



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

SCIENCE

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

1075

H. S. Gutowsky N. Bruce Hannay Donald Kennedy Daniel E. Koshland, Jr Donald Lindsley Ruth Patrick Raymond H. Thompson

1976

Alfred E. Brown James F. Crow Hans Landsberg Edward Ney Frank Press Frank W. Putnam Maxine Singer Arthur M. Squires

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: PATRICIA ROWE

News and Comment: John Walsh, Luther J. Carter, Deborah Shapley, Robert Gillette, Nicholas Wade, Constance Holden, Barbara J. Culliton, 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: Margaret Allen, Isabella Bouldin, Eleanore Butz, Mary Dorfman, Sylvia Eberhart, Judith Givelber, Corrine Harris, Nancy Hartnagel, Oliver Heatwole, Christine Karlik, Margaret Lloyd, Eric Poggenpohl, Jean Rockwood, Leah Ryan, Lois Schmitt, Richard Semiklose, Ya Li Swigart, Eleanor Warner

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. Burklund, 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 xv, Science, 28 June 1974. ADVERTISING CORRESPONDENCE: Room 1740, 11 W. 42 St., New York, N.Y. 10036. Phone: 212-PE-6-1858.

International Cooperation in Geology

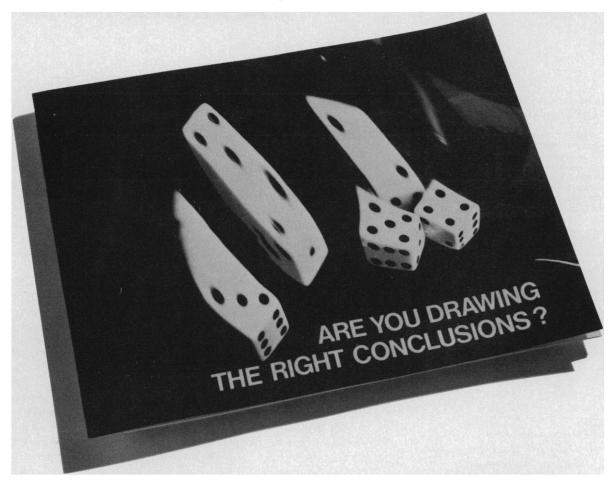
Relationships between the developed countries and the less developed countries (LDC's) are evolving. Some changes that are not so dramatic as the shifting behavior with respect to energy and materials may have equally important long-term consequences. One is a growing realization of the role of science and technology as determinants of standards of living. This awareness has only been partially acted on. Nevertheless, competence in science has been growing in some of the LDC's, and in some fields, notably the earth sciences, the gap between the two worlds has been closing. In proportion to their populations the LDC's do not have as many geologists as the advanced countries. However, the quality of their best is excellent.

Existence of widespread competence in geology has made feasible a major program which is likely to facilitate development while aiding in further transfer of geologic capabilities. The new enterprise has organizational aspects that reflect evolving attitudes and realities. First, it is a child of two parents—the International Union of Geological Sciences (IUGS) and the United Nations Educational, Scientific and Cultural Organization (UNESCO). Second, the program is guided by a Board on which the developing countries are solidly represented.

The enterprise, called the International Geological Correlation Programme (IGCP), includes 73 countries that have begun active participation or have indicated intention to do so. The program consists of more than 30 projects and additional ones will likely be approved by the Board. The projects must meet the following criteria: (i) be relevant to the major scientific and practical objectives of the program; (ii) fill a world-wide, continental, or regional need; (iii) preferably involve various branches of geology and their applications and require interdisciplinary cooperation; (iv) require coordinated international action and facilitate common understanding between specialists from different countries; and (v) result not only in long-term benefits but also, whenever possible, yield tangible short-term practical results for the participants.

Examples of projects include Holocene changes in sea level, circum-Pacific plutonism, and a number of projects on Precambrian geology and geochemistry. The project on sea-level movements has important world-wide applied aspects since many millions of people live in low-lying coastal regions. The project on circum-Pacific plutonism includes studies of phenomena related to the collisions of tectonic plates and will surely lead to better understanding of geochemical processes giving rise to ore formation. The projects on Precambrian geology and geochemistry will exploit major opportunities for studies. Earlier Precambrian investigations were handicapped by lack of accurate dating. Thus about six-sevenths of Earth history was incompletely accessible. More than half the world's mineral wealth comes from Precambrian formations and crucial information about origin and evolution of life remains buried in those rocks.

While the joint program is only in its initial phases and definitive results are few, indications are that it will be a success. It has already generated widespread international cooperation and interest and has involved developed and less developed countries in joint enterprises. The magnitude of accomplishments will depend on the extent to which supporting funds become available. Thus far the total expenditures by UNESCO and IUGS have amounted to about \$400,000. It has been used to provide for a Secretariat and to cover expenses of organizational, working group, and regional meetings. To facilitate broader participation, especially by the poorer LDC's, additional funds must be found. Involvement in projects relevant to their own country's needs, in cooperation with experts from other lands, would serve as an ideal training experience. This principle was proved in practice during the 1950's and 1960's by the Agency for International Development and the U.S. Geological Survey which together participated in the upgrading of geological competence in some 80 countries. The present IGCP represents a program that builds on a solid foundation of previous constructive effort with an organizational arrangement reflecting changed international realities. —PHILIP H. ABELSON



This brochure can take the gamble out of choosing a statistics calculator.

Whether you're doing basic statistics or complex data analysis, this 12-page guide will show you exciting new approaches...new alternatives. It starts with a powerful computing calculator that fits in your pocket and lets you do data analysis anywhere—at any time. The brochure then shows you desktop programmable calculators that can quickly solve statistical problems that would otherwise be done on a large mainframe computer. When you compare the capabilities of HP's computing calculators you'll see what a

cost. But judge for yourself. Send for our free guide and see if an HP statistics calculator isn't your best bet.

HP-Calc. Inq., P.O. Box 301, Loveland, Colorado 80537

dramatic difference they can make in

Whatever your discipline, research,

the efficiency and accuracy of

plant management ... HP has a

your statistical problem solving.

chemistry, agriculture, economics,

statistics calculator that can probably give you faster solutions at lower

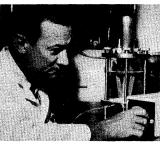


Sales and service from 172 offices in 65 countries.

Innovations in Ultrafiltration for Concentration, Desalting, and Fractionation

Research chemist adjusts speed control on Amicon high-flow stirred cell in preparation for reconcentration of an antiserum purified by column chromatography.

Senior technician controls stirring of Amicon micro-ultrafiltration system during protein binding study.









Pharmacologist checks inlet pressure on Amicon highyield hollow fiber dialyzer/ concentrator during vaccine production run.

Biochemist samples concentrate from reservoir of Amicon thin-channel ultrafiltration system during enzyme purification process.

Amicon has applied the principles of ultrafiltration to the development of membranes and systems used daily by medical researchers and life scientists throughout the world.

Amicon pioneered the development of anisotropic highrate ultrafiltration membranes for selective separation of macromolecules.

Amicon introduced the concept of thin-channel ultrafiltration which minimizes the effect of concentration polarization—the accumulation of retained solute on the membrane surface—thereby maximizing transmembrane flow and selectivity.

Amicon has utilized its advanced membrane technology to produce anisotropic high-speed hollow fibers which are made from several polymeric types to obtain a variety of performance advantages.

Amicon's worldwide organization is staffed by scientists and technicians, ready to help solve your concentration, desalting, and fractionation problems.

Amicon is *innovation* in ultrafiltration, with the research, technology, applications and methodology to help solve your macromolecular separation problems. Write, Amicon Corporation, 21 Hartwell Avenue, Lexington, Mass. 02173, or call (617) 862-7050, for technical literature, service or system demonstration.



Nuclepore membranes can make a big difference in their life tomorrow...





Leukocyte Chemotaxis (the study of white blood cell migration) relates directly to the body's immunity mechanism, and may someday provide a mass screening method for diseases: even an early warning test for cancer. Nuclepore membranes are now playing

a major role in this research.

and in your work today.

The time and quality factors in chemotactic measurement are most important to mass screening potential... and Nuclepore membranes are making a big difference in these factors. For example, Dr. Leonard C. Altman of the University of Washington reports faster, more reproducible results with Nuclepore membranes than with those used before. Unique, straight-through pores, uniformity and zero leaching of offensive surfactants, are major reasons why.

These unusual properties, plus many others, are also making big differences in numerous other fields.

For example, in analyzing very fine seawater particulate, the physical uniformity of Nuclepore membranes eliminates the need for matched weight or control filters.

In a totally different field—virology—very low adsorption, has increased virus yields in the filtrate by 95 percent.

And what about our air? In recent research, Nuclepore membranes turned up nearly 2 times the amount of asbestos previously believed to be in the air we breathe. And, only Nuclepore membranes had the characteristics needed for the job—precisely sized pores and a smooth, flat surface that's ideal for microscopy.

Some of these same properties, along with stain-resistance and auto-clavibility, are also proving valuable to people involved in tissue culture and cell analyses.

In addition, Nuclepore membranes are easily "customized." In one case,

a membrane with custom pore size and density is regulating bi-directional gas flow between two chambers in response to changes in differential pressure.

To get the full story of how Nuclepore membranes are making a big dif-

ference, ask for our case history booklet:
PoreTraits™.
We also welcome your specific inquiries. Just call or write.





7035 Commerce Cir., Pleasanton, Ca. 94566 (415) 462-2230

Circle No. 478 on Readers' Service Card

1194b 20 JUNE 1975

Avoid separation anxiety with disc electrophoresis.



Purify...

Disc Electrophoresis is being used in more than 5000 laboratories worldwide as a routine purity check on preparative separations accomplished by other methods . . . or, as the primary purification process itself.

Identify...

Wherever exact knowledge of the composition of mixtures of charged, large molecules is vital, Disc Electrophoresis is there. Specific pore size of polyacrylamide support media plus variable pH gradients make for consistent high resolution, easier identification.

Separate...

Achieve spectacular resolution capability for literally thousands of materials. Patented discontinuous buffer system* acts to preconcentrate sample molecules . . . thus, separation in the sieving gel begins with extremely sharp initial zones, permitting identification of separated bands only tens of microns thick—and tens of microns apart.

This photo shows the high-resolution capacity of Disc Electrophoresis. It's a simulation, but not an exaggeration.

Order through:



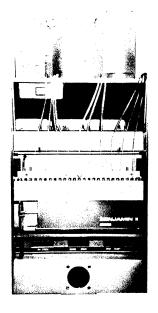
Scientific

Ames Company Division Miles Laborator In Canada: 77 Belfield Rd., F	ries, Inc., Elkha Rexdale, Ontar	SCI rt, Indiana 46514 io
☐ I already know at send me your ☐ I'd like to know r phoresis	new catalo	og.
Send me more information.		II me for an pointment.
name		
institution		
address		
city	state	zip
telephone		

Disc Electrophoresis...Now Available Exclusively from Ames Company.

^{*}The discontinuous pH buffer system is integral to Disc Electrophoresis, a test method owned and patented (U.S. Pat. No. 3,384,564)
by Mount Sinai Hospital Research Foundation, New York, which has
designated Ames Company as sole licensee for the manufacture and
sale of apparatus and materials to perform the method. Ames, in
turn, conveys to its customers an automatic sublicense to perform
the method with apparatus and reagents sold by Ames.

AUTOMATED TISSUE PROCESSING FOR ELECTRON MICROSCOPY



BENJAMIN II

... IS A SIMPLE AND COMPACT APPARATUS
FOR THE AUTOMATIC DEHYDRATION AND
INFILTRATION IN EPOXY RESINS OF SMALL
SPECIMENS OF THE TYPE USED IN ELECTRON
MICROSCOPY AND ALSO IN LIGHT MICROSCOPY (SEMI-THIN SECTIONS).

... REPRODUCES ACCURATELY AND RE-LIABLY THE PROCEDURE YOU PREFER AND USES THE FLUIDS YOU ARE FAMILIAR WITH.

... MOVES UP TO 24 SPECIMEN-BASKETS
SIMULTANEOUSLY IN A TROUGH THE CONTENT OF WHICH CAN BE EXCHANGED UP
TO 29 TIMES FROM 10 DIFFERENT CONTAINERS ACCORDING TO A PRE-SELECTED
PROGRAMME.

... IS SMALL AND EASY TO USE, CAN BE SET UP TO WORK DURING THE NIGHT, CLEANS ITSELF:



ERNEST F. FULLAM, INC.

SCIENTIFIC CONSULTANTS - ACCESSORIES SUPPLIER
P. O. BOX 444, SCHENECTADY, N. Y. 12301
TELEPHONE 518 785-5533
U.S.A.

LABORATORY TESTED SUPPLIES AND ACCESSORIES FOR MICROSCOPY

WRITE FOR CATALOG

Circle No. 156 on Readers' Service Card

BATHS

WATER



Dozens of models:
High-Powered,
Fast-Setting, Jar,
Shaker. +0.2°C.
or better control.

Sil

To +180°C. (+356°F.) and +260°C. (+500°F.). Many models, some with solid-state controls. REFRIGERATED



0°C. to +100°C. (+212°F.). Types include Jar, LN₂ and Thermal Shock Test. +0.2°C. control.

(83 MODELS* . . . \$150-\$8,000)

*All standard — plus the expertise to custom-engineer to your exact need. In general, that's our story. For specifics, write: BLUE M Electric Company; Corporate Headquarters: Blue Island, Illinois 60406.



Circle No. 417 on Readers' Service Card

Unique Culture Perfusion.

By simulating in-vivo environment, Amicon's unique anisotropic hollow fiber capillaries provide an excellent matrix for the growth of cells and organ explants. In a three-dimensional vascular system called a VITAFIBER Culture Unit, these capillaries control perfusion of cell aggregates with nutrients as well as exchange of excreted substances. A wide variety of primary cultures and cell lines can be grown. Choice of molecular cut-ouranges. Autoclavable units available. Complete systems offered.

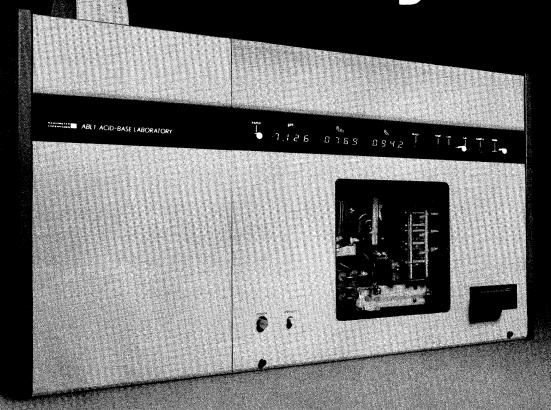
For more information, write Amicon Corporation, 21 Hartwell Avenue Lexington, MA 02173, or call (617) 862-7050.

Circle No. 419 on Readers' Service Card

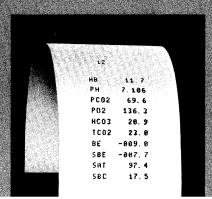




RADIOMETER'S acid-base laboratory



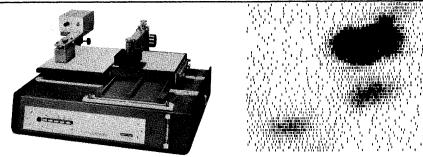
Automatic
Self-Calibrating
Self-Cleaning
Always Ready



A single insertion of blood automatically initiates the direct measurement of pH, PCO₂, PO₂ and hemoglobin in Radiometer's new acid-base laboratory. These values are then used by the internal computer to derive all meaningful acid-base parameters which are printed out as shown, Digital values of pH, PCO₂ and PO₂ are simultaneously displayed on the front panel. In addition to automatic measurement and calculation, the ABL1 is also self-cleaning and self-calibrating . . . always maintaining its own instant availability.

For color brochure containing detailed information contact us at 811 Sharon Drive, Cleveland, Ohio 44145. Phone (216) 871-8900:





FAST, DIRECT TLC SCANNING of radioactive isotopes... with 'fingerprints'

Tritium, Carbon 14, Phosphorus 32 and all other radioisotopes are easily detected on TLC plates with this special sensitive Berthold TLC Plate Scanner. Selected programs can scan the entire plate or just a portion, or handle 4, 6 or 8 chromatograms on one 20 x 20cm plate—all automatically. Adjustable scanning speeds are 15 to 6000mm/h; fast return at 6000mm/h. A dot-printer permits the registration of two-dimensional radioactivity distributions, providing a "fingerprint" (shown above). For more details, contact Shandon Southern Instruments, Inc., 515 Broad Street, Sewickley, Pa. 15143.



Circle No. 402 on Readers' Service Card

Industrial, Clinical and Research Opportunities

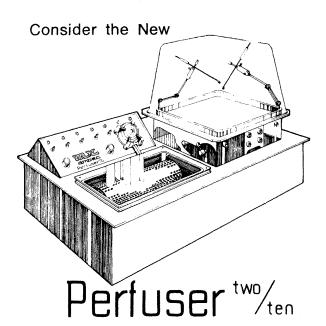
Exceptional opportunities in industry, education, government and in medical organizations throughout the U.S. Highly remunerative staff situations and directorships for medical and scientific personnel in basic and applied research and in all phases of medicine for industry. A per-ABSOLUTELY COST-FREE service for the vice for the career-minded professional on the way up. Send your C.V. to Herbert E. Picker, Director of Health Services.

WORLD WIDE HEALTH CONSULTANTS, INC.

(The Selective Professional's Placement Service) 919 Third Avenue New York, N.Y. 10022 Tel. (212) 421-1240

TO Perfuse laboratory

animal organs in vitro or in situ



MX International, Inc. 303/343-8330

876 Ventura Street Aurora, Colorado 80011

Circle No. 531 on Readers' Service Card

some tissue culture hoods just sit there



not the **CEI** STERILE 200

OUR DUAL SAFETY VENT AIRFLOW SYSTEM OFFERS THE PERFECT ENVIRONMENT FOR T.C. PROCEDURES, A CLASS 100 CLEAN WORK AREA FOR THE SAMPLE AND A NEGATIVE AIRFLOW TO PROTECT THE OPERATOR.

UNITS AVAILABLE 4', 5' & 6' WIDE IN BENCH OR CONSOLE MODELS. ALL FEATURE S/S INTERIOR, HEPA FILTER, FLOURESCENT LIGHTING, SAFETY GLASS SASH.

FOR INFORMATION ON THIS AND OTHER LAMINAR FLOW SAFETY AIRFLOW SYSTEMS, WRITE

**CONTAMINATION CONTROL INCORPORATED Forty Foot & Tomlinson Roads Kulpsville, Pa. 19443 215-368-2200

cortisol

Gamma labelled partners for adrenal/pituitary testing

ACTH Immunoassay Kit I-125

- Determines ACTH concentration in plasma over the range of 10-4000 pg/ml
- Plasma extraction avoids marked and variable incubation damage to labelled hormone by removing proteolytic enzymes
- Plasma extraction eliminates interfering substances which may be present in plasma samples
- Plasma extraction enables the assay to be performed in a short time, using higher concentrations of labelled ACTH
- Adsorbent glass employed for the plasma extraction increases specificity and does not extract significant amounts of most other proteins and polypeptides
- All reagents and tubes provided except water and acetone

Cortipac Assay Kit Se-75

- Only a small sample size (100 μl serum) required
- Predispensed reaction tubes are provided for convenience, precision and accuracy
- Only one 30-minute, temperature independent, incubation period
- Four predispensed human serum standards are provided for convenience and accuracy
- Gamma-labelled cortisol [selenium-75 for counting convenience
- Covers the assay range of $2.5-45 \mu g/100 \text{ m}$

Amersham/Searle also has in vitro kits available for HPL, Insulin, T3 uptake, Total T4, Normalized Thyroxine ratio and Cortisol. Reagents available include high specific activity B₁₂, Liothyronine, Thyroxine and Insulin.

For further information or to order, please contact our Customer Service Department.

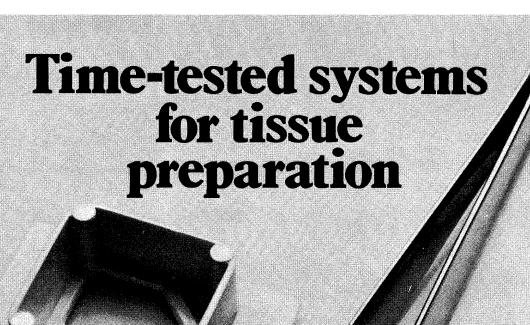
For RIA/CPB testing... Amersham/Searle

Our specific activity is service



2636 S. Clearbrook Drive/Arlington Heights, Illinois 60005 Telephone: (312) 593-6300--Telex: 28-2452 In Canada: 400 Iroquois Shore Road/Oakville, Ontario Telephone: (416) 364-2183.--Telex: 069-82216

Circle No. 401 on Readers' Service Card



Tissue-Tek

Tissue-Tek® II

Tissue-Tek and Tissue-Tek II Systems offer the ultimate in efficiency for the histology laboratory. These unique systems are totally organized to help you

take a specimen from start to storage with maximum convenience. There's never a doubt about who's who. Each specimen is permanently identified when the plastic cassette is inscribed. The same cassette carries the tissue specimen every



step of the way—through processing, embedding, sectioning, and into storage. You can have your choice of Tissue-Tek processing capsules, stainless steel base molds, and embedding rings. Or you may prefer Tissue-Tek II process/embedding cassettes with perforated stainless steel covers and base molds. Whatever your setup, our organized systems can save you effort and expense from start to storage. We'd be happy to send you our booklet, "The organized tissue embedding system." Just send us a request.

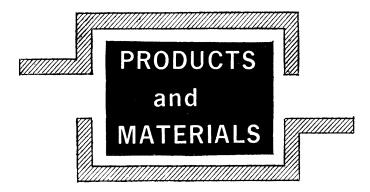
Lab-Tek Products...setting the standards by which performance is judged.

Lab-Tek Products

DIVISION MILES LABORATORIES, INC.
30 W 475 North Aurora Road, Naperville, Illinois 60540

Circle Na. 421 on Readers' Service Card





Blood Glucose Analyzer

Model 23A utilizes 25-microliter plasma samples and detects glucose in the range of 0 to 500 milligrams per deciliter. Operator pushes a button to prepare the instrument, injects the sample, reads the value within 45 seconds, and then clears the instrument for the next sample. Calibration is done the same way except that a standard is substituted for the sample. Principle of operation is the reaction of glucose with glucose oxidase to yield gluconic acid and hydrogen peroxide. The analyzer detects the peroxide. Yellow Springs Instrument Company, Incorporated. Circle 784.

Pipette Tip-Loading System

Sampler 810Q Organized Tips eliminate cross contamination, save preparation time, and eliminate the risks of mouth-pipetting when used with hand-operated systems. The tips come in trays of 240 tips each, five trays to a box. The tips do not need to be touched prior to use; the operator merely places a tray at a time nearby. The tips accommodate volumes of 0.005 to 0.2 milliliter. Oxford Laboratories Incorporated. Circle 780.

Ionized Calcium Analyzer

The SS-20 measures ionized calcium in whole blood in less than 3 minutes. First, 500 microliters of serum or heparinized blood is introduced through a sample injection port, then the operator activates the device. Analysis, restandardization, measurement, and clean out are performed and the result is displayed as milliequivalents of calcium ion per liter of sample. The device contains materials sufficient for 200

Newly offered instrumentation, apparatus, and laboratory materials of interest to researchers in all disciplines in academic, industrial, and government organizations are featured in this space. Emphasis is given to purpose, chief characteristics, and availability of products and materials. Endorsement by Science or AAAS is not implied. Additional information may be obtained from the manufacturers or suppliers named by circling the appropriate number on the Readers' Service Card (on pages 1166A and 1222A) and placing it in the mailbox. Postage is free.—RICHARD G. SOMMER

analyses. Usual values in normal patients are around 2 milliequivalents per liter; the SS-20 results are readable to 0.01 milliequivalent and the standard deviation on normal replicate samples is 2 percent. Orion Biomedical Division, Orion Research, Incorporated. Circle 783.

Hematology Standard

Haem-C is a stable reference and control that simulates human blood for use in automated and other clinical analyses. The product contains human erythrocytes and simulated leukocytes. Haem-C is packaged in six 7-milliliter vials per set. The vials are designed to be handled like patient samples; printed assay values are available for a variety of instrument systems and procedures. J. T. Baker Chemical Company. Circle 781.

Disposable Thermometers

The Single Use devices consist of 45 chemical dots debossed on an aluminum strip. The dots are activated by temperatures between 96.0° and 104.8°F. Each dot is sensitive to a specific temperature 0.2°F higher or lower than the next or preceding dot, respectively. The device is placed under the patient's tongue for 30 to 45 seconds; the operator reads the last dot to have fired. The device may then be discarded. Biomedical Sciences, Incorporated. Circle 779.

Blood and Tissue pO₂ Monitor

The SM7001 module accepts oxygen tension signals from a catheter and conditions them for display. A digital readout of values from 0 to 800 millimeters of mercury appears on a front panel. The module also provides a standard signal output for potentiometric recording. Minimum and maximum alarm limits may be set and telemetry is also an option. Gould, Incorporated, Statham Instruments Division. Circle 782.

Cyclic Adenosine Monophosphate Assay

Kits are now available for assay of cyclic AMP. Sensitivity is 0.11 to 27 picomoles per tube. Assay may be prepared for counting in approximately 2 hours. Accuracy is enhanced by presentation of results in the form of a log-logit plot. Assay procedure involves extraction of sample of tissue, urine, or plasma; competition of tritiated and free cyclic AMP; adsorption of free cyclic AMP on Dextran-coated charcoal, and liquid scintillation counting. Diagnostic Products Corporation. Circle 785.

Peroxidase-Conjugated Antisera

Twelve different products are available to provide a specific method for the localization of tissue antigens. All are prepared from the immunoglobulin G fraction of the corresponding antiserum after fractionation with DEAE cellulose. These soluble bound-protein complexes retain their enzymatic and immunological activity. Products include human immunoglobulins G, A, M, and E and rabbit, mouse, rat, and guinea pig immunoglobulin G all produced in goat; also mouse, rat, and guinea pig IgG produced in rabbit. Miles Laboratories, Research Division. Circle 777.

Thyroxine Radioimmunoassay

Immo-Phase T₄ is a solid-phase assay system for thyroxine. Antibody is bound to porous glass in a diluted, measured, and ready-to-use form. The operator performs a single step to separate the bound antibody/antigen after a single incubation and centrifugation. The iodine-labeled T₄ has a guaranteed shelf life of 120 days. Available in kit form, the system can provide up to 20 determinations in 90 minutes in disposable work trays. Total radioactivity of less than 2 microcuries per vial means that the waste may be disposed of without special handling. Corning Diagnostics, Corning Glass Works. Circle 778.

Literature

Carbon Dioxide Incubators are featured in a four-page brochure. Photographs, specifications, and design features are included. Hotpack Corporation. Circle 786.

Instructional Aids lists items pertinent to the medical-diagnostic fields of radio-immunoassay, hepatitis and thyroid function testing, nuclear medicine, and others. Abbott Laboratories, Diagnostics Division, Circle 789.

Prostaglandin **Precursors**

Arachidonic acid [1-14C] 40-60mCi/mmol Toluene: methanol, 9:1, in dry ice in Combi-vial NEC-661 \$94/10 μ Ci \$193/50 μ Ci

Arachidonic acid [5,6,8,9,11,12,14,15-3H(N)] 60-100Ci/mmol Hexane solution in amber sealed

NET-298 \$128/250 µCi \$378/1mCi

8,11,14-Eicosatrienoic acid [1-14C] 40-60mCi/mmol Hexane solution in Combi-vial NEC-632 \$110/50μCi \$328/250μCi

8,11,14-Eicosatrienoic acid [3-3H(N)] 15-30Ci/mmol Hexane solution in Combi-via NET-459 \$146/250μCi \$420/1mCi

NEN's labeled Prostaglandins include PGA1, PGA2, PGB1, PGE1, PGE2, PGF1 $^{\alpha}$, and PGF2 $^{\alpha}$.

Write for our new Lipids and Prostaglandins Brochure.



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

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

Circle No. 427 on Readers' Service Card

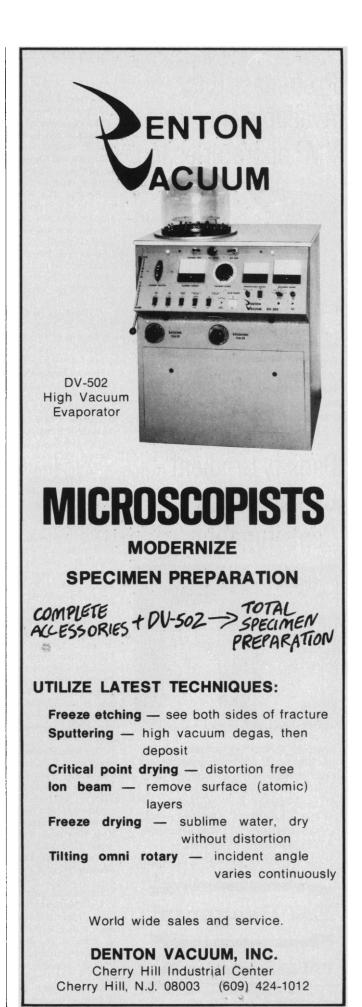
The New Gould 2400: the best performing, most versatile wide channel recorder you can buy.

It is available in 2, 3 and 4 channel configurations utilizing combinations of 50 mm and 100 mm channels totalling 200 mm. It has a 99.65% linearity over the full 100 mm channel. Its frequency response is an outstanding 30 Hz at 100 mm, 50 Hz at 50 mm and up to 125 Hz at reduced amplitude. It has a full range of signal conditioners for just about any scientific-medical application about any scientific-medical application.

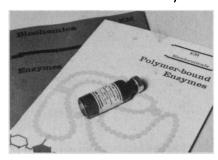
For full details on why the new Gould 2400 is the best performing direct writing recorder you can buy, write Gould Inc., Instrument Systems Division, 3631 Perkins Avenue, Cleveland, Ohio 44114. Or Kouterveldstraat 13, B 1920 Diegem, Belgium.



Circle No. 345 on Readers' Service Card



Proteinase K is Available only from EM Laboratories, Inc.



Proteinase K is useful in RNA, DNA isolation and for serological purposes.

Proteinase K is chromatographically purified, and lyophilized. Also available as a carrier-bound enzyme.

Send for literature, specifications, applications and prices.

Circle No. 356 on Readers' Service Card

Density Gradient Chemicals for Centrifugation



SuprapurTM chemicals with assayed purity levels. Ideal for UV monitoring, separation and electrophoresis. Free from RNase and DNase activity.

Cesium acetate Cesium bromide Cesium chloride Cesium formate Cesium sulfate Rubidium bromide Rubidium chloride Sucrose

Circle No. 357 on Readers' Service Card



EM Laboratories, Inc.

associate of E. Merck, Darmstadt, Germany 500 Executive Boulevard, Elmsford, New York 10523 Telephone 914/592-4660

BOOK REVIEWS

(Continued from page 1202)

vier, New York, 1974. xxiv, 450 pp., illus. \$42.50. Frontiers of Biology, vol. 38.

The Geometry of the Stars. James P. Calk. Exposition, Hicksville, N.Y., 1975. 104 pp., illus. \$5. An Exposition-Banner Book.

Growth and Morphometry of the Carcass, Selected Bones, Organs, and Glands of Mule Deer. Allen E. Anderson, Dean E. Medin, and David C. Bowden. The Wildlife Society, Washington, D.C., 1974, 122 pp., illus. Paper, \$2.10. Wildlife Monographs, No. 39.

Grzimek's Animal Life Encyclopedia. Bernhard Grzimek, Ed. Vol. 1, Lower Animals. Irenaus Eibl-Eibesfeldt and six others, Eds. Translated from the German edition (Zurich, 1970). Van Nostrand Reinhold, New York, 1974. 600 pp., illus. \$29.95; the 13-volume set, \$325.

A Handbook on Drug and Alcohol Abuse. The Biomedical Aspects. Frederick G. Hofmann in collaboration with Adele D. Hofmann. Oxford University Press, New York, 1975. xvi, 330 pp. Cloth, \$10.95; paper, \$6.95.

Human Engineering. The Body Re-examined. John Lenihan. Braziller, New York, 1975. viii, 212 pp., illus. \$7.95.

The Impact of Energy Development on Water Resources in Arid Lands. Literature Review and Annotated Bibliography. Charles Bowden. University of Arizona Office of Arid Lands Studies, Tucson, 1975. viii, 278 pp. Spiral bound, \$10. Arid Lands Resource Information Paper No. 6.

An Introduction to Attribution Processes. Kelly G. Shaver. Winthrop, Cambridge, Mass., 1975. vi, 154 pp., illus. Cloth, \$5.95; paper, \$3.95

Isozymes, Vol. 1, Molecular Structure. Papers from a conference, New Haven, Conn., Apr. 1974. Clement L. Markert, Ed. Academic Press, New York, 1975. xx, 856 pp., illus. \$33.

New York, 1975. xx, 856 pp., illus. \$33.

Last of the Naturalists. The Career of C. Hart
Merriam. Keir B. Sterling. Arno (New York
Times), New York, 1974. xvi, 482 pp. + plates.
\$23. Natural Sciences in America.

Lecture Outline of Preventive Veterinary Medicine for Animal Science Students. I. A. Schipper. Burgess, Minneapolis, ed. 5, 1975. vi, 314 pp., illus. Paper, \$9.95.

Liquid Crystals and Plastic Crystals. Vol. 1, Physico-Chemical Properties and Methods of Investigation. G. W. Gray and P. A. Winsor, Eds. Horwood, Chichester, England, and Halsted (Wiley), New York, 1974. xiv, 384 pp., illus. \$32.50. Ellis Horwood Series in Physical Chemistry.

Magnetic Resonance in Chemistry and Biology. Papers from a summer school, Baško Polje, Yugoslavia, June 1971. Janko N. Herak and Krešimir J. Adamić, Eds. Dekker, New York, 1975. xvi, 552 pp., illus. \$34.50.

Man and His Environment. Policy and Administration. Lynton K. Caldwell. Harper and Row, New York, 1975. xvi, 172 pp. Cloth, \$9.95; paper, \$3.95. Man and His Environment Series.

Mathematical Theory of Dislocations and Fracture. R. W. Lardner. University of Toronto Press, Toronto, 1974. xii, 364 pp., illus. \$20. Mathematical Expositions No. 17.

The Medical Assistant. An Intermediate Level of Health Care Personnel. Proceedings of a conference, Bethesda, Md., June 1973. Donald M. Pitcairn and Daniel Flahault, Eds. World Health Organization, Geneva, 1974 (available from Q Corp., Albany, N.Y.). 172 pp. Paper, \$5. Public Health Papers No. 60.

Mental Health and Going to School. The Woodlawn Program of Assessment, Early In-

The First Wide Range Microtome-cryostat... Temperatures from $-15^{\circ}\mathrm{C}$ to $-50^{\circ}\mathrm{C}...$ Frozen Sections from 40 μ to 2μ .

The Harris LoTemp model WRC is two microtome-cryostats in one. A single unit that can do both routine diagnostic procedures and such sophisticated research procedures as thin section light microscopy, autoradiography, fluorescence microscopy and other histological procedures, at a cost comparable to presently available routine cryostats.

The Harris model WRC is compact...can be moved anywhere it's needed. The cold chamber has extra room for tissue handling, storage or freeze drying. Full opening top with special access ports combines the features of a totally closed system with the easy accessibility of open top models.

Available equipped with International Equipment Corp. microtomes, or cryostat only prepared for installation of your present I.E.C. microtome. Installed stereo zoom microscope also available.

For a full description of the Harris WRC and its wide range of additional features write or call . . .



Harris Manufacturing Co., Inc. 14 Republic Road Treble Cove Industrial Park North Billerica, Mass. 01862 (617) 667-5116

tervention, and Evaluation. Sheppard G. Kellam, Jeannette D. Branch, Khazan C. Agrawal, and Margaret E. Ensminger. University of Chicago Press, Chicago, 1975. xvi, 214 pp., illus.

Methods in Enzymology. Sidney P. Colowick and Nathan O. Kaplan, Eds. Vol. 35, Lipids. Part B. John M. Lowenstein, Ed. Academic Press, New York, 1975. xviii, 654 pp., illus. \$34.50.

Microbiology. Vol. 1. V. A. Shorin and L. S. Smirnova, Eds. Translated from the Russian edition (Moscow, 1972). Hall, Boston, 1975. viii, 154 pp., illus. \$21. Itogi Summaries of Scientific Progress. Biology Series.

Models for the Analysis and Planning of Urban Systems. Alan Walter Steiss. Lexington Books (Heath), Lexington, Mass., 1975. xii, 354 pp., illus. \$19.50.

National Materials Policy. Proceedings of a meeting, Washington, D.C., Oct. 1973. National Academy of Sciences, Washington, D.C., 1975. viii, 216 pp., illus. Paper, \$8.25.

A New Dictionary of Physics. H. J. Gray and Alan Isaacs, Eds. Longman, New York, ed. 2, 1975. iv, 620 pp., illus. \$35.

Oceanology. Vol. 1. A. P. Kapitsa, P. S. Lineykin, and K. S. Losev, Eds. Translated from the Russian edition (Moscow, 1971). Hall, Boston, 1975. viii, 128 pp., illus. \$19. Itogi Summaries of Scientific Progress. Geophysics Series.

Optical Resonance and Two-Level Atoms, L. Allen and J. H. Eberly. Wiley-Interscience, New York, 1975. xvi, 234 pp., illus. \$19.95. Interscience Monographs and Texts in Physics and Astronomy, vol. 28.

Organotransition-Metal Chemistry. Proceedings of a seminar, Honolulu, May 1974. Yoshio Ishii and Minoru Tsutsui, Eds. Plenum, New York, 1975. xiv, 398 pp., illus. \$37.50.

Plant Propagation. Principles and Practices. Hudson T. Hartmann and Dale E. Kester. Prentice-Hall, Englewood Cliffs, N.J., ed. 3, 1975. x, 662 pp., illus. \$17.25.

Platelets, Thrombosis, and Inhibitors. Proceedings of a seminar, Honolulu, Dec. 1973. Paul Didisheim, Takio Shimamoto, and Hiroh Yamazaki, Eds. Schattauer, Stuttgart, 1974. xvi, 522 pp., illus. Paper, DM 128.

Polarization Nuclear Physics. Proceedings of a meeting, Ebermannstadt, Germany, Oct. 1973. D. Fick, Ed. Springer-Verlag, New York, 1974. x, 294 pp., illus. Paper, \$9.90. Lecture Notes in Physics, vol. 30.

Pollen. Biology, Biochemistry, Management. R. G. Stanley and H. F. Linskens. Springer-Verlag, New York, 1974. x, 308 pp., illus. \$24.60.

Précis de Botanique. 1, Protocaryotes et Thallophytes Eucaryotes. R. Gorenflot. Doin, Paris, 1975. 184 pp., illus. Paper, 98 F.

Predicting Adult Stature for Individuals. A. F. Roche, H. Wainer, and D. Thissen. Karger, Basel, 1975. viii, 114 pp. Paper, \$20. Monographs in Paediatrics, vol. 3.

Present Problems in Haematology. Proceedings of a meeting, Prague, Aug. 1973. J. Libánský and L. Donner, Eds. Excerpta Medica, Amsterdam, and Avicenum, Prague, 1974 (U.S. distributor, Elsevier, New York). xii, 302 pp., illus. \$34.25.

Principles of Pathobiology. Mariano F. La Via and Rolla B. Hill, Jr., Eds. Oxford University Press, New York, ed. 2, 1975. xviii, 296 pp., illus. Cloth, \$11.95; paper, \$7.95.

Principles of Psychotherapy. Irving B. Weiner. Wiley-Interscience, New York, 1975. xvi, 332 pp. \$15.95. Wiley Series on Personality Processes.

Progress in Biophysics and Molecular Biology. Vol. 28. J. A. V. Butler and D. Noble, Eds.



Range	Price
0 - 20 µV	\$ 98
20 - 200 μl	\$ 98
100 ul - 1 ml	\$ 98
0.5 -5 ml	\$125
	0 - 20 μ/ 20 - 200 μl 100 μl - 1 ml

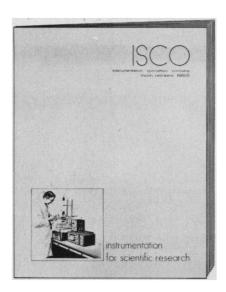
Better than 1% accuracy full range, all models.



94 Lincoln Street Boston, Mass. 02135 (617) 787-5050

RANN

NEW CATALOG FROM ISCO



instruments for high and low pressure liquid chromatography and electrophoresis

You'll find 56 pages describing complete high performance liquid chromatographs, L/C components, and instruments for other separating techniques used in the research lab. Components include absorbance monitors with unsurpassed performance and many features unavailable elsewhere. high and low pressure pumps including models which will reproduce any gradient program you'll ever need, large and small fraction collectors, and a digital electronic integrator specifically designed for L/C.

Check the number below on your reader service card for a current ISCO catalog. If you're in a hurry, write direct or phone collect [402] 464-0231.





BOX 5347 LINCOLN, NEBRASKA 68505 PHONE (402) 464-0231 TELEX 48-6453

Circle No. 561 on Readers' Service Card

Pergamon, New York, 1974. vi, 434 pp. + plates. \$50.

Progress in Medical Virology. Vol. 19. Joseph L. Melnick, Ed. Karger, Basel, 1975. xviii, 382 pp., illus. \$67.25.

Prophylaxis of Infectious and Other Diseases. Papers from a symposium, Berne, Nov. 1973. T. M. Inderbitzin, Ed. Karger, Basel, 1975. vi, 272 pp., illus. \$34. Monographs in Allergy, vol. 9.

Psychology in Progress. Readings from Scientific American. Richard C. Atkinson, Ed. Study guides by John P. J. Pinel. Freeman, San Francisco, 1975. x, 392 pp., illus. Cloth, \$12; paper, \$6.25.

Psychotherapy and Multiple Personality. Selected Essays. Morton Prince. Nathan G. Hale, Jr., Ed. Harvard University Press, Cambridge, Mass., 1975. viii, 328 pp., illus. \$12.50.

Radio Astronomy. F. Graham Smith. Penguin, Baltimore, ed. 4, 1975. 270 pp. + plates. Paper, \$3.50.

Reading for Working. A Functional Literacy Anthology. Thomas G. Sticht, Ed. Human Resources Research Organization, Alexandria, Va., 1975. x, 186 pp., illus. Paper, \$5.95.

Regulation of Hepatic Metabolism. Proceedings of a symposium, Copenhagen, May 1973. Frank Lundquist and Niels Tygstrup, Eds. Munksgaard, Copenhagen, and Academic Press, New York, 1974. 828 pp., illus. \$47.50.

A Revision of the Subfamily Coelidinae (Homoptera: Cicadellidae). Tribes Tinobregmini, Sandersellini and Tharrini. Mervin William Nielson. The British Museum (Natural History), London, 1975. 198 pp., illus. Paper, £12.20. Bulletin of the British Museum (Natural History), Entomology, Supplement 24.

Stanning Electron Microscopy in Biology. A Students' Atlas on Biological Organization. R. G. Kessel and C. Y. Shih. Springer-Verlag, New York, 1974. xii, 346 pp., illus. \$19.

Science and Technology in the Arts. A Tour through the Realm of Science/Art. Stewart Kranz. Margaret Holton and Elizabeth S. Fowler, Jr., Eds. Designed by Lorraine Hohman, Myron S. Hall III, and Jean King. Van Nostrand Reinhold, New York, 1974. 336 pp. \$40.

Scientific Strategies in Human Affairs. To Tell the Truth. Irwin D. J. Bross. Exposition, Hicksville, N.Y., 1975. viii, 174 pp. \$6.50. An Exposition-University Book.

Sexual Signatures. On Being a Man or a Woman. John Money and Patricia Tucker. Little, Brown, Boston, 1975. vi, 250 pp., illus. \$6.95.

Slow Sand Filtration. L. Huisman and W. E. Wood. World Health Organization, Geneva, 1974 (available from Q Corp., Albany, N.Y.). 122 pp., illus. Paper, \$7.40.

Sonar and Underwater Sound. Albert W. Cox. Lexington Books (Heath), Lexington, Mass., 1975. xx, 146 pp., illus. \$13.

Stability Theory and the Existence of Periodic Solutions and Almost Periodic Solutions. T. Yoshizawa. Springer-Verlag, New York, 1975. viii, 234 pp. Paper, \$9.50. Applied Mathematical Sciences, vol. 14.

Stellarators. D. V. Skobel'tsyn, Ed. Translated from the Russian edition (Moscow, 1973) by Dave Parsons. Consultants Bureau (Plenum), New York, 1974. viii, 132 pp., illus. Paper, \$32.50. The Lebedev Physics Institute Series, vol. 65.

Strategy for Tomorrow. André Beaufre. Translated from the French edition (Paris, 1972). Crane, Russak, New York, 1974. xii, 92 pp. \$7.50.

Structure and Bonding. Vol. 19. J. D. Dunitz and seven others, Eds. Springer-Verlag, New York, 1974. iv, 170 pp., illus. \$26.30.

Studies in Optimization. G. B. Dantzig and B. C. Eaves, Eds. Mathematical Association of America, Washington, D.C., 1974. x, 180 pp., illus. \$10. Studies in Mathematics, vol. 10.

The Superficial Veins of the Human Brain. Veins of the Brain Stem and of the Base of the Brain. Henri M. Duvernoy. Springer-Verlag, New York, 1975. viii, 110 pp., illus. \$36.10.

Switching Circuits for Engineers. Mitchell P. Marcus. Prentice-Hall, Englewood Cliffs, N.J., ed. 3, 1975. xvi, 300 pp., illus. \$15. Prentice-Hall Electrical Engineering Series.

Synthetic Fibrinolytic Thrombolytic Agents. Chemical, Biochemical, Pharmacological and Clinical Aspects. Proceedings of a symposium, Paris, Sept. 1972. K. N. von Kaulla and J. F. Davidson, Eds. Thomas, Springfield, Ill., 1975. xvi, 490 pp., illus. \$34.50.

Temperature Regulation and Drug Action. Proceedings of a symposium, Paris, Apr. 1974. P. Lomax, E. Schönbaum, and J. Jacob, Eds. Karger, Basel, 1975. xxii, 406 pp., illus. \$60.

Thermal Vibrations in Crystallography. B. T. M. Willis and A. W. Pryor. Cambridge University Press, New York, 1975. xvi, 280 pp., illus. \$27.50

Tissue Culture and Plant Science 1974. Proceedings of a congress, Leicester, England, July 1974. H. E. Street, Ed. Academic Press, New York, 1975. xii, 502 pp., illus. \$19.75.

Toward the Future. Pierre Teilhard de Chardin. Translated from the French edition (Paris, 1973) by René Hague. Harcourt Brace Jovanovich, New York, 1975. 224 pp. \$6.95. A Helen and Kurt Wolff Book.

Treatise on Solid State Chemistry. Vol. 2, Defects in Solids. N. B. Hannay, Ed. Plenum, New York, 1975. xiv, 528 pp., illus. \$35.

Tritium and Its Compounds. E. Anthony Evans. Halsted (Wiley), New York, 1975. xvi, 822 pp. illus. \$55.

Unready Kilowatts. The High-Tension Politics of Ecology. Gary Farmer. Open Court, La Salle, Ill., 1975. vi, 356 pp. \$11.95.

Vagotomy. Latest Advances with Special Reference to Gastric and Duodenal Ulcers Disease. F. Holle and S. Andersson, Eds. Springer-Verlag, New York, 1974. xii, 244 pp., illus. Paper, \$34.50.

Valvular Heart Disease. Edmund H. Sonnonblick and Michael Lesch, Eds. Grune and Stratton, New York, 1975. xii, 400 pp., illus. \$24.75. Progress in Cardiovascular Diseases.

The Volunteer Subject. Robert Rosenthal and Ralph L. Rosnow. Wiley-Interscience, New York, 1975. xiv, 266 pp., illus. \$14.95. Wiley Series on Personality Processes.

WATFIV. Fortran Programming with the WATFIV Compiler. John B. Moore. Reston Publishing Co. (Prentice-Hall), Reston, Va., 1975. xvi, 492 pp., illus. Paper, \$8.50.

The Wild Canids. Their Systematics, Behavioral Ecology and Evolution. M. W. Fox, Ed. Van Nostrand Reinhold, New York, 1975. xviii, 508 pp., illus. \$19.95. Behavioral Science Series.

World Review of Nutrition and Dietetics. Vol. 21. Geoffrey H. Bourne, Ed. Karger, Basel, 1975. x, 328 pp., illus. \$76.

Why Information Systems Fail. Henry C. Lucas, Jr. Columbia University Press, New York, 1975. xii, 130 pp. \$11.

Wonders of Creation. Meguer V. Kalfaian. Vantage Press, New York, 1974. viii, 88 pp., illus. \$4.95.

Zoologie et Assistance Technique. Proceedings of a conference, Liege, Belgium, May 1973. Jean-Claude Ruwet, Ed. Fondation de l'Université de Liège pour les Recherches Scientifiques en Afrique Centrale, Liege, 1974. 382 pp., illus. Paper, 600 BF.