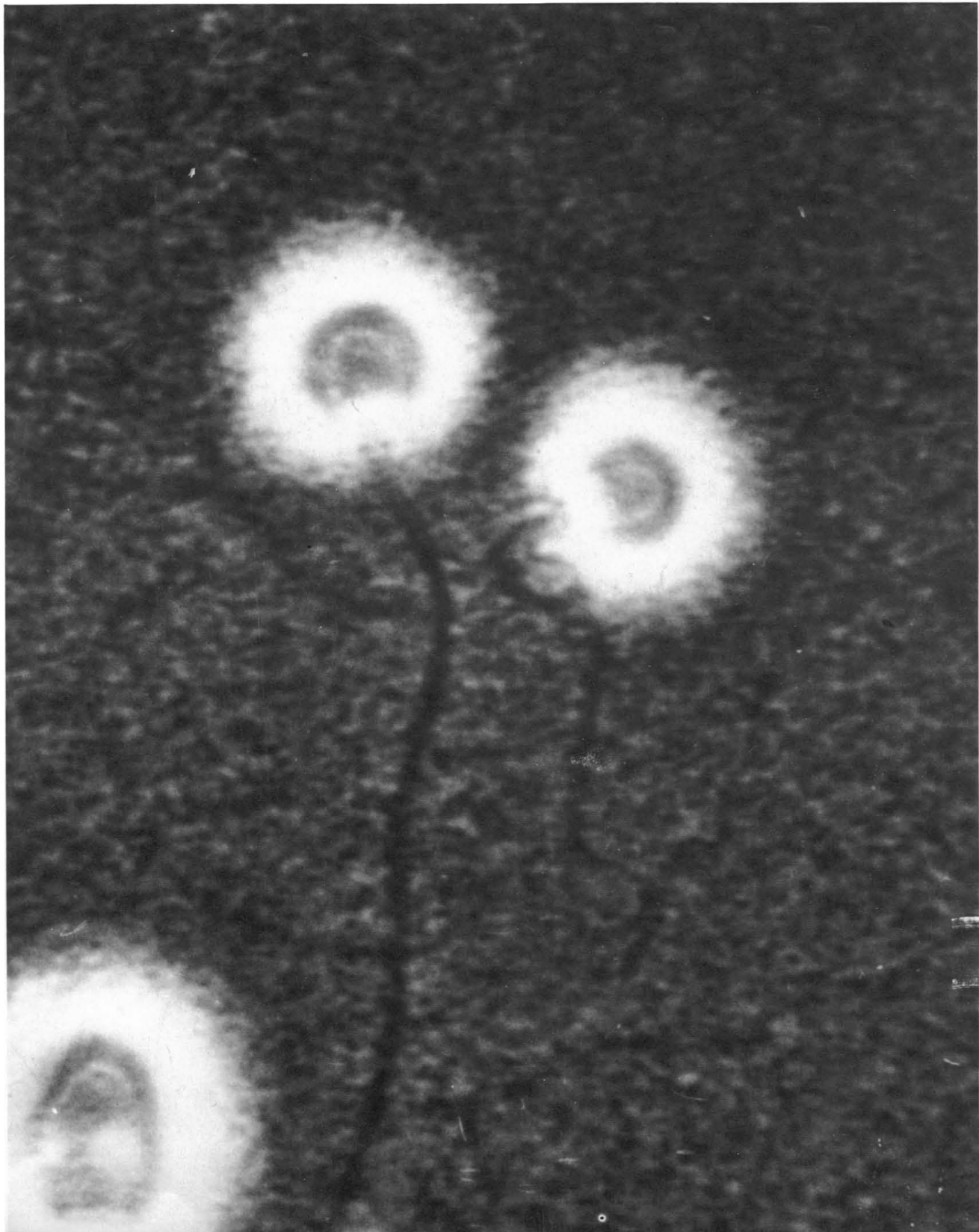


SCIENCE

13 November 1970

Vol. 170, No. 3959

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

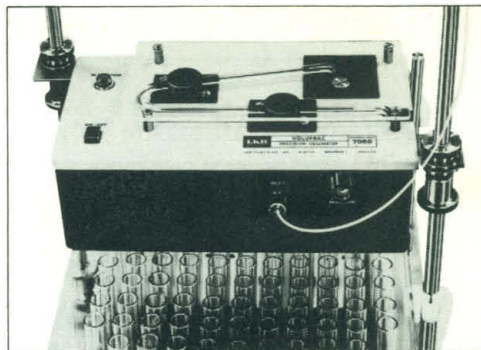


They're just made for each other, The NEW LKB VoluFrac Precision Volumeter was designed to combine perfectly with the LKB UltroRac.



IN THE SERVICE OF SCIENCE

LKB INSTRUMENTS INC. 12221 PARKLAWN DRIVE, ROCKVILLE MD. 20852
11744 WILSHIRE BLVD. LOS ANGELES CALIF. 90025
6600 WEST IRVING PARK ROAD, CHICAGO, ILL. 60634



What's the volume of a drop?

LKB have solved this problem ----- Eliminate the drop!

The LKB VoluFrac avoids all the conversion errors you meet when you have to convert from number-of-drops to equivalent volume.

No more need to compensate as your drop size changes due to alterations in viscosity, liquid density or surface tension.

With the VoluFrac, the measurements are always accurate, no matter what the liquid is like, or how it changes during measurements.

The LKB VoluFrac employs a NEW technique that puts it way ahead of all other volumetric instruments. It measures the liquid volumes **DIRECTLY and as the liquid flows**. It is simple to use, and auto-

matic in operation. Just switch it on, and forget it.

The inbuilt electronic-logic of the VoluFrac acts as your watch dog, ensuring that each part-volume meets the exacting standards programmed in the logic unit. At the least hint of malfunctioning, it shuts off the flow.

The glass and teflon system of the VoluFrac accepts all kinds of acids and corrosive substances.

Fraction collecting is just one of the many applications for the VoluFrac.

It is fully compatible with the LKB UltroRac and all other types of fraction collectors having electronic control and counting.

If you would like to know more about this unique instrument or have a demonstration, just write to the address above.



Sales and service in USA: New York, Boston, Washington, Chicago, St. Louis, Atlanta, Houston, Los Angeles; in Europe: Stockholm, The Hague, Copenhagen, Rome, Vienna, London; and throughout the world.



Up-to-date books for class use, for reference and for your own library.

Warren: BIOLOGY AND WATER POLLUTION CONTROL

This topical book is ideal as a textbook for courses in environmental biology, as supplementary reading in biology or sanitary engineering, or for personal information about one of the major problems of the decade. The first part discusses historical, social, technological and legal aspects of pollution. The next part summarizes the physics and chemistry of polluted water. The following sections explain how organisms and communities adapt physiologically, morphologically, and ecologically to environmental changes. The final section evaluates ecological change and delineates and explains the role of biologists and other scientists in water pollution control and research.

By **Charles W. Warren**, *Oregon State Univ.* About 480 pp. with about 125 ill. About \$11. Ready Jan. 1971

Christensen: NEUTRALITY CONTROL IN THE LIVING ORGANISM

This excellent new programmed text follows the same format as *pH and Dissociation* and *Enzyme Kinetics*. It is a self-teaching guide that will help your students fully comprehend one of the most difficult aspects of biochemistry and physiology. Here, in six hours reading time, they will find a concise account of the production and disposition of the hydrogen ion. The book fully explains the concept of metabolic balancing of acidifying and alkalizing processes. For example, Dr. Christensen discusses bone deposition and dissolution in its relation to the acid-base balance and also investigates the role of diphosphogluceric acid in the function of hemoglobin.

By **Halvor N. Christensen**, *Univ. of Mich. Medical School.* About 160 pp. Illus. About \$6.50 Just ready.

Debré & Celers: CLINICAL VIROLOGY

This volume draws a detailed picture of the clinical symptoms, epidemiology, and prophylaxis of viral infections and diseases. Under the editorial direction of two of today's foremost authorities, fifty-seven contributors present a practical distillation of their advanced knowledge. The book approaches viruses by the body system they affect: neurological, muscular, digestive, cardiovascular, respiratory, urogenital, hematopoietic, lymphatic. Eye, ear, and skin viruses are also discussed.

Edited by **Robert Debré**, and **Josette Celers**, 57 contributors. 871 pp. 125 figs. \$38. Aug. 1970.

Sutherland: A SYNOPSIS OF PHARMACOLOGY

New 2nd Edition

The rewritten and expanded new 2nd edition of this text offers remarkably concise yet complete information on all aspects of drugs in current use. Written in outline form, this book emphasizes drug mechanisms and interactions. The various classes of drugs as well as specific agents are discussed. The use, dosage, toxicity, indications and contraindications for each drug are discussed and related to the chemistry, physiology, and pathology of a disease. A complete chapter covers every aspect of prescription writing.

By **V. C. Sutherland**, *Univ. of Calif. School of Medicine, San Francisco.* 720 pp. Illustrated. Aug. 1970. \$10.75.

Guyton: TEXTBOOK OF MEDICAL PHYSIOLOGY

New 4th Edition

Dr. Guyton's text presents the body as a single functioning organism controlled by a myriad of regulatory systems. It emphasizes the mechanisms which promote homeostasis. This new 4th edition incorporates the latest scientific findings and suggestions of the book's users. Chapters on general and cellular physiology have been extensively revised. The list of references has been brought up to date and expanded to guide students to other bibliographies which cover the entire spectrum of physiology.

By **Arthur C. Guyton**, *Univ. of Miss. School of Medicine.* About 1100 pp. 757 figs. About \$18.50. Ready Jan. 1971.

W. B. SAUNDERS COMPANY

West Washington Square, Philadelphia, Pa. 19105

Please send and bill me:

- ☐ Warren: **BIOLOGY AND WATER POLLUTION CONTROL** About \$11.
- ☐ Debré & Celers: **CLINICAL VIROLOGY** \$38
- ☐ Sutherland: **A SYNOPSIS OF PHARMACOLOGY** \$10.75
- ☐ Christensen: **NEUTRALITY CONTROL IN THE LIVING ORGANISM** About \$6.50
- ☐ Guyton: **TEXTBOOK OF MEDICAL PHYSIOLOGY** About \$18.50

Name _____

Address _____

City _____

Zip _____

13 November 1970

Vol. 170, No. 3959

SCIENCE

LETTERS	Drift Theory: Antarctica and Central Asia: <i>G. G. Simpson</i> ; Cleaner Air—Fewer Cars: <i>H. F. Bezdek</i> ; Geologists Prefer Earth Studies: <i>J. A. Noble</i> ; Appalachia: Focus of Health Care: <i>W. W. Dow</i> ; Federal Largesse: <i>R. A. Carpenter</i>	678
----------------	---	-----

EDITORIAL	Young Scientists and the AAAS: <i>M. Lipkin, Jr.</i>	683
------------------	--	-----

ARTICLES	Optical Communications Research Progress: <i>S. E. Miller</i>	685
	Temperature-Sensitive Mutations in <i>Drosophila melanogaster</i> : <i>D. T. Suzuki</i>	695
	Environmental Protection in the City of New York: <i>M. Eisenbud</i>	706

NEWS AND COMMENT	Medical Education: Carnegie Panel Urges Expansion, Acceleration	713
	New Congress: Election Produces Changes in Key Committee Posts	715
	Tax-Exempt Litigation: IRS Curbs Draw Widespread Opposition	716
	Land Use: Congress Taking Up Conflict Over Power Plants	718
	Economics: Nobel Prize for 1970 Awarded to Samuelson of M.I.T.: <i>Lhurwicz</i>	720

BOOK REVIEWS	<i>The Insects of Australia</i> , reviewed by <i>H. E. Evans</i> ; other reviews by <i>J. P. Scott</i> , <i>A. B. Meinel</i> , <i>J. J. Gibson</i> , <i>J. W. Purseglove</i> , <i>P. Howard-Flanders</i> , <i>R. A. Lewin</i> ; Books Received	722
---------------------	--	-----

REPORTS	Central North Atlantic Plate Motions over the Last 40 Million Years: <i>J. D. Phillips</i> and <i>B. P. Luyendyk</i>	727
	Marine Sediments: Dating by the Racemization of Amino Acids: <i>J. L. Bada</i> , <i>B. P. Luyendyk</i> , <i>J. B. Maynard</i>	730
	Aboriginal Trephination: Case from Southern New England?: <i>B. W. Powell</i>	732

BOARD OF DIRECTORS

H. BENTLEY GLASS
Retiring President, Chairman

ATHELSTAN SPILHAUS
President

MINA REES
President-Elect

DAVID BLACKWELL
RICHARD H. BOLT

LEWIS M. BRANSCOMB
BARRY COMMONER

VICE PRESIDENTS AND SECTION SECRETARIES

MATHEMATICS (A)
R. P. Boas
F. A. Ficken

PHYSICS (B)
R. G. Sachs
Albert M. Stone

CHEMISTRY (C)
Herman S. Bloch
Leo Schubert

ASTRONOMY (D)
Helmut A. Abt
Arlo U. Landolt

ANTHROPOLOGY (H)
Margaret Mead
Anthony Leeds

PSYCHOLOGY (I)
Frank W. Finger
William D. Garvey

SOCIAL AND ECONOMIC SCIENCES (K)
Robert M. Solow
Harvey Sapolsky

HISTORY AND PHILOSOPHY OF SCIENCE (L)
George Wald
Raymond J. Seeger

PHARMACEUTICAL SCIENCES (Np)
Don E. Francke
Joseph A. Oddis

AGRICULTURE (O)
Matthias Stelly
Michael A. Farrell

INDUSTRIAL SCIENCE (P)
Sherwood L. Fawcett
Burton V. Dean

EDUCATION (Q)
Frederic B. Dutton
Phillip R. Fordyce

DIVISIONS

ALASKA DIVISION

T. Neil Davis
President

Irma Duncan
Executive Secretary

PACIFIC DIVISION

George E. Lindsay
President

Robert C. Miller
Secretary

SOUTHWESTERN AND ROCKY MOUNTAIN DIVISION

Loren D. Potter
President

Marlowe G. Anderson
Executive Secretary

SCIENCE is published weekly on Friday and on the fourth Wednesday in September by the American Association for the Advancement of Science, 1515 Massachusetts Ave., NW, Washington, D.C. 20005. Now combined with *The Scientific Monthly*®. Second-class postage paid at Washington, D.C. Copyright © 1970 by the American Association for the Advancement of Science. Annual subscription \$12; foreign postage: Americas \$3; overseas \$5; single copies, 50¢ (back issues, \$1) except Guide to Scientific Instruments which is \$3. School year subscription: 9 months, \$9; 10 months, \$10. Provide 4 weeks notice for change of address, giving new and old address and zip codes. Send a recent address label. SCIENCE is indexed in the *Reader's Guide to Periodical Literature*.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

Stratospheric Ozone with Added Water Vapor: Influence of High-Altitude Aircraft: <i>H. Harrison</i>	734
Mercury Compounds Reduce Photosynthesis by Plankton: <i>R. C. Harriss, D. B. White, R. B. Macfarlane</i>	736
Collagen: Mobile Water Content of Frozen Fibers: <i>R. E. Dehl</i>	738
Pheromone Transport and Reception in an Amphipod: <i>E. Dahl, H. Emanuelsson, C. von Mecklenburg</i>	739
Secondary Structure of Ribosomal RNA: <i>K. A. Hartman and G. J. Thomas, Jr.</i>	740
Climatic Anomaly over the United States during the 1960's: <i>J. Namias</i>	741
Actomyosin from <i>Physarum polycephalum</i> : Electron Microscopy of Myosin-Enriched Preparations: <i>V. T. Nachmias and W. C. Ingram</i>	743
Prolactin: Evidence That it Is Separate from Growth Hormone in Human Blood: <i>A. G. Frantz and D. L. Kleinberg</i>	745
Ribonuclease-Inhibitor System Abnormality in Dystrophic Mouse Skeletal Muscle: <i>B. W. Little and W. L. Meyer</i>	747
Proteolytic Reaction of Mammalian Spermatozoa on Gelatin Membranes: <i>P. Gaddum and R. J. Blandau</i>	749
Alcohol Dehydrogenase in Maize: Genetic Control of Enzyme Activity: <i>Y. Efron</i>	751
Energy Transduction: Inhibition of Cockroach Feeding by Naphthoquinone: <i>D. M. Norris et al.</i>	754
Slow Synaptic Excitation in Sympathetic Ganglion Cells: Evidence for Synaptic Inactivation of Potassium Conductance: <i>F. F. Weight and J. Votava</i>	755
Predicting Measures of Motor Performance from Multiple Cortical Spike Trains: <i>D. R. Humphrey, E. M. Schmidt, W. D. Thompson</i>	758
<i>Technical Comments: Fluorescent Labeling of Chromosomal DNA: Superiority of Quinacrine Mustard to Quinacrine: T. Caspersson, L. Zech, E. J. Modest</i>	762
ASSOCIATION AFFAIRS The Developmental Sciences: State and Fate of Research Funding: <i>V. H. Denenberg</i> ; Biocybernetics of the Dynamic Communication of Emotions and Qualities: <i>M. Clynes</i>	763

GERALD HOLTON
PHYLLIS V. PARKINS

LEONARD M. RIESER
KENNETH V. THIMANN

WILLIAM T. GOLDEN
Treasurer

WILLIAM BEVAN
Executive Officer

GEOLOGY AND GEOGRAPHY (E)
Richard H. Mahard
William E. Benson

ENGINEERING (M)
Newman A. Hall
Raynor L. Duncombe

INFORMATION AND
COMMUNICATION (T)
R. M. Hayes
Scott Adams

ZOOLOGICAL SCIENCES (F)
David Bishop
Richard J. Goss

MEDICAL SCIENCES (N)
Leon O. Jacobson
F. Douglas Lawrason

STATISTICS (U)
Douglas Chapman
Ezra Glaser

BOTANICAL SCIENCES (G)
William A. Jensen
Arthur W. Cooper

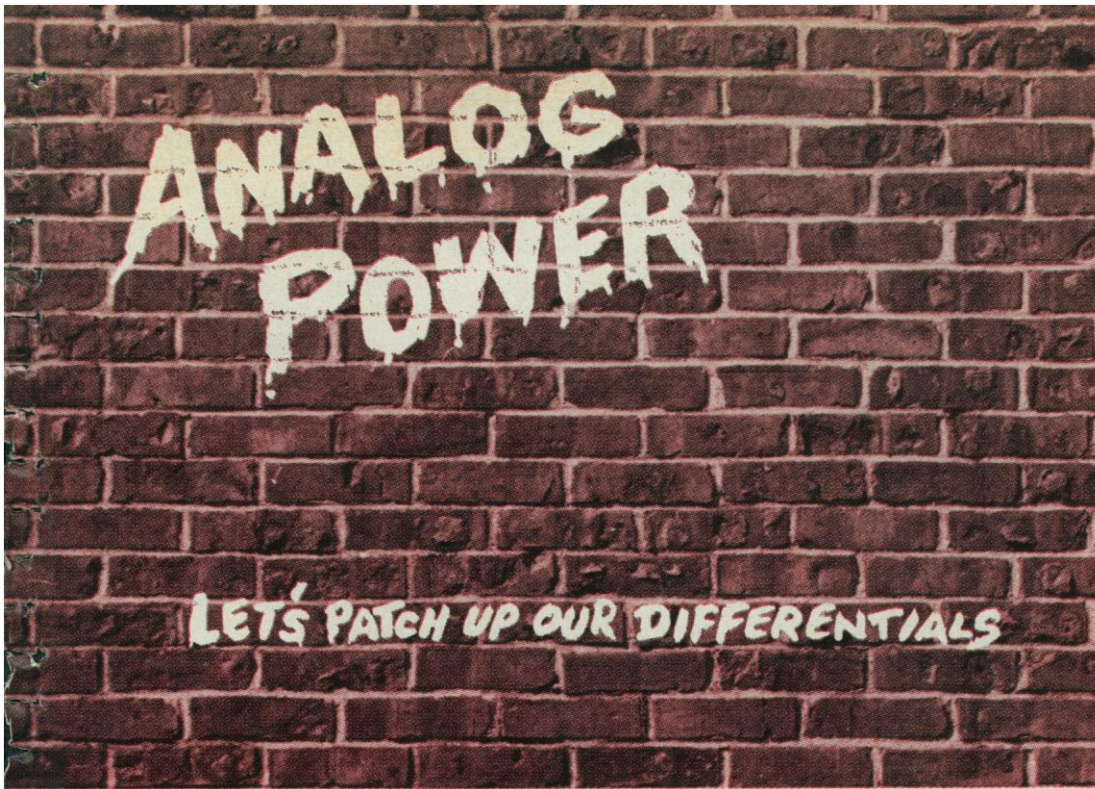
DENTISTRY (Nd)
Robert C. Likins
Richard S. Manly

ATMOSPHERIC AND HYDROSPHERIC
SCIENCES (W)
Robert M. White
Louis J. Battan

COVER

Mammalian spermatozoa applied to thin layers of gelatin impregnated with India ink and fixed in glutaraldehyde (method of Dr. Noel Owers) show proteolytic activity confined to the acrosome. Release of the enzyme occurs solely in the region of the acrosome, in a manner which is species-specific. See page 749. [Penelope Gaddum and Richard J. Blandau, University of Washington]

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.

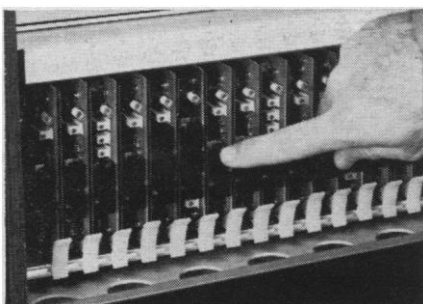


80,002

For teaching some things, an analog computer is a natural. Such as describing non-linear behavior in dynamic physical systems. We just made it more natural with MINIAC^{T.M.}, our new educational analog computer.

To begin with, you get handsome design . . . and controls that make small-scale analog programming easy. No component patching required . . . you select a mathematical function . . . you push a button, and you're in business. You get twelve selections — convert a summer to an integrator . . . or a multiplier to a divider . . . or a summer to track-store, or vice versa. All instantly selectable with a push-button switch.

It's desktop size. It offers operating convenience you expect to find in bigger, more expensive machines.



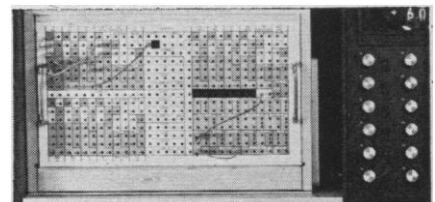
Many of the ideas come from the 2000 science and engineering educators who use our computers.

Digital readout and a dual select system allows you to control the monitoring of any two variables simultaneously. Without re-programming.

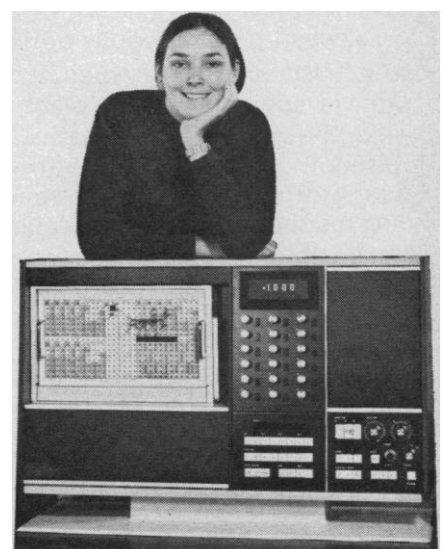


Overload features reduce troubleshooting time. An overload alarm with indicator lights, for one. A logic HOLD control which can be programmed to freeze all integrators for easy location of overload. And overload store for transient overloads without stopping the program solution.

You get smaller, removable program panels, labeled with universal math programming symbols. Inputs and outputs are color-coded. This allows fast, easy, programming. Logic expansion module, too. There is more to our new computer than we can show here. For more information, we have a new brochure. Yours for the asking.

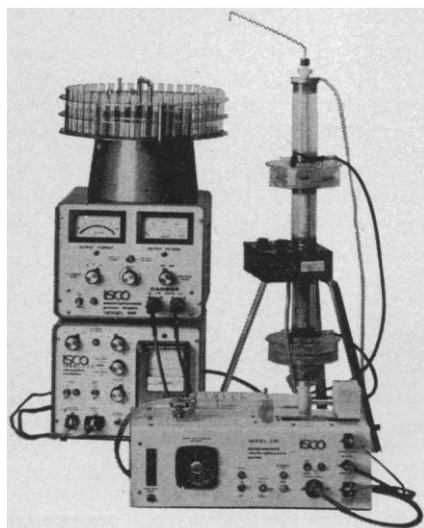


Write or call Electronic Associates, Inc., 185 Monmouth Parkway, W. Long Branch, New Jersey 07764. Phone: 201-229-1100; in U.K.: Victoria Road, Burgess Hill, Sussex; in Europe: 116 rue des Palais, Brussels; in Canada: 6427 Northam Drive, Malton, Ontario.



EAI / education systems

scanning density gradient electrophoresis



Easy determination of electrophoretic mobilities as well as physical separation of mixtures and quantitative microanalytical results can be obtained with the ISCO Model 210 Density Gradient Electrophoresis apparatus. Microgram size samples can readily be separated. Low sample concentration permits the use of dilute buffers, allowing a wide operational temperature range of from 0 to 25° C.

Between preset periods during which the density gradient column is subjected to an electric field, the column is automatically raised and lowered past a narrow bandwidth UV absorbance scanning monitor. Quantitative results can be obtained from these scans or from a final chart record made automatically at the conclusion of migration as separated specimen components are discharged into a fraction collector for further assay.

For more information please request Brochure E37.



**INSTRUMENTATION
SPECIALTIES COMPANY**

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

erence to the possibility that a study has profound implications for our understanding "perhaps for origin and distribution of ore deposits," as I have recently been working on this very subject (1). In this study I come to the conclusion that the constituents that form the metal deposits probably originated in the earth's upper mantle, at a depth of some 25 miles below the surface. I would therefore be much more interested in knowing the constitution of the earth's upper mantle, 25 miles below us, than the constitution of the moon, 250,000 miles away in space.

A sidelight of my study of the metal provinces was that one particular area in southern Arizona, partly overlapping into New Mexico, has a record of production plus probably reserves of copper of some \$26 billion of gross value. This is by far the greatest known concentration of value of nonferrous metallic wealth in the United States. It will be noted that this total gross value is very nearly equal to the total cost of the entire Apollo program including development, research, and facilities (\$24 billion). On the other hand, the *net* value of the metallic wealth is very much less. In fact, I doubt very much if the *net* value of all the known metallic wealth of the United States is equal to the cost of the Apollo program.

JAMES A. NOBLE
1474 East California Boulevard,
Pasadena, California 91106

Reference

1. J. A. Noble, *Geol. Soc. Amer. Bull.* **81**, 1607 (1970).

Appalachia: Focus of Health Care

As a member of the Student Health Coalition whose activities were discussed in "Appalachia: Two approaches in student summer health projects" (21 Aug., p. 746), I would like to clarify the relationship between our project and Vanderbilt University. Goldhaber implied that there was a lack of cooperation on the part of the university. In actual fact our project received considerable support from a number of faculty members and the offices of the dean of the medical school and the chancellor of Vanderbilt. . . . The lack of cooperation alluded to does not pertain to individuals but to the institutional framework. The medical school has investigated but not committed itself to the academic questions involving comprehensive

health care. A faculty committee recently issued a report concerning the university's role in health care and declared, "It is really not a question as to whether the Vanderbilt Medical Center can afford to hire such a Director [for comprehensive health care programs] but rather whether it can afford not to and still provide leadership for or even remain in the mainstream of American medicine in the future."

We are hopeful that the recommendations of this report can be realized, and that the university will be increasingly responsive to the need for research in new methods of urban and rural health care delivery.

WILLIAM W. DOW
Box 40, Station 17,
Vanderbilt Medical School,
Nashville, Tennessee 37203

Federal Largesse

In Greenberg's article ("Daddario: Scientific community's friend on the Hill is leaving," 25 Sept., p. 1291) I believe there is a misconception of the power of the appropriations subcommittees vis-à-vis the authorizing committees. He suggests that the legislative process consists solely of doling out money and that a member who is not on the appropriations committees might just as well stay home. This isn't so. The overview committees for federal programs do exercise great influence, particularly when they also handle annual authorization bills. The Joint Committee on Atomic Energy, the Senate and House Armed Services Committees, and the Space Committees of each body have had a major impact on science, research, and development. Senator Lister Hill chaired the Labor and Public Welfare Committee and thus influenced the course of the National Institutes of Health.

An objective analysis would show substantial effects of the National Science Foundation authorization hearings on appropriations this past session—only the second year they have been held. It seems clear that these annual hearings in the House and Senate—given the direction and momentum of the Daddario era—will have a key role in the determination of the future federal patronage of science.

RICHARD A. CARPENTER
Legislative Reference Service,
Library of Congress,
Washington, D.C. 20540

We want to be useful ...and even interesting

Kodak

Planning a talk with slides?

We get just as much for film that turns into good slides as poor ones. For some obscure reason, we prefer that you show good ones. Accordingly, we have put out a new Kodak publication. Don't bother with it if you just want to do a snow job

with your data. If you want to communicate with your audience—whatever their level—and would like suggestions, send for a copy of "Slides with a Purpose" from Department 640, Eastman Kodak Company, Rochester, N.Y. 14650.

Sticking to it

You were younger than 3 when you first understood clearly that one thing can be made to stick to another. Can you explain how it happens?

* * *

In 1943 sharp-seeing aerial reconnaissance lenses were coming apart. Canada balsam, the only optical cement anybody had ever heard of, had generally been used on smaller, more pampered optics. Bob Dann, a Kodak chemist anxious to do his bit, worked hard and found something better. Now there are six KODAK Optical Cements, none of them Canada balsam, all known to those who need to know about them, probably.¹ We find it hard to make money selling optical cement, but our lenses hold together well.

* * *

EASTMAN 910 Adhesive has become very well known but not as an optical cement, though it was discovered when an attempt to measure the refractive index of methyl cyanoacrylate permanently stuck together the prisms of one of our refractometers. Now we feel strong excitement at the prospect of how much of the world's goods—even its clothing—might be put together with EASTMAN Adhesives, which don't all have to be cyanoacrylates and indeed are not. Meanwhile we have announced improved versions of cyanoacrylate EASTMAN 910 Adhesive.²

* * *

Adhesion matters to us for more than industrial adhesives. Why do our photographic emulsions stick so nicely to our film base? "Why?" like "how?" can be a deep question. J. R. Dann's work and thought on adhesion have developed to the

¹If we have missed you, complain to Special Products Sales, Kodak Apparatus Division, Rochester, N.Y. 14650.

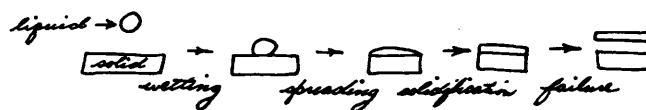
²Details from Industrial Chemicals Division, Eastman Chemical Products, Inc., Kingsport, Tenn. 37662.

point of asserting on p 321 of the February, 1970 issue of *Journal of Colloid and Interface Science*:³

A modification of the Good-Girafalco-Fowkes-Young equation is used to calculate nondispersion interactions I_{SL}^D at the interface for nine polymeric solids and four polar series of liquids. The relationship of I_{SL}^D to work of adhesion W_A and the spreading coefficient S_c is shown. A linear relationship is found to exist between I_{SL}^D and γ_L^D , the nondispersion energy component of the liquids, for the series of polar liquids and the solids studied. The slopes of the I_{SL}^D vs. γ_L^D curves vary depending upon the polymer surface. Intercepts of the curves may be a measure of π_s , the reduction in the surface energy of the solid resulting from adsorption of vapor from the liquid.

* * *

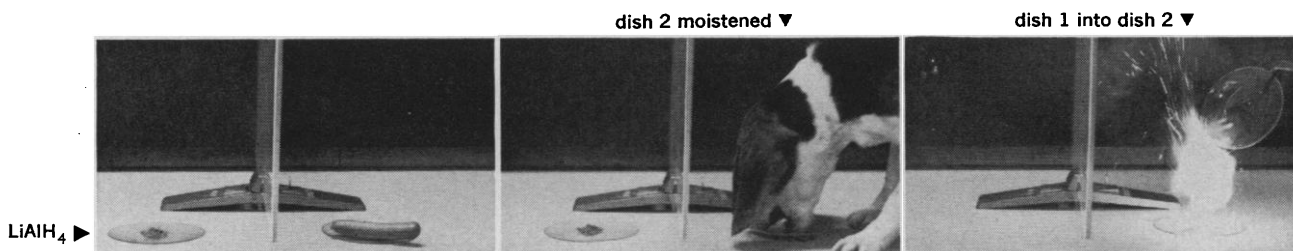
Dann is asked why this appears under the title "Forces Involved in the Adhesive Process." He steps to the blackboard and draws:



That's the history of a bond, he explains. Surface energetics of wetting and spreading are what the paper is about. It examines the significance of the cosine of the angle of contact as a measure of work required to form interface. Misconceptions, if any, will be cleansed in the flames of controversy. Then it will be necessary to tackle the rheology of the system: kinetics of spreading, viscoelastic behavior of both the adhesive and the substrate. Solidification follows—by polymerization, freezing, or solvent evaporation. Some of the best of chemists will continue to study degree and orientation of crystallinity, glass transition temperatures, melting points, moduli, and their relation to molecular architecture. Fracture mechanisms constitute, of course, still another discipline.

It has been a long haul since 1943. There is still a long way to go.

³Reprint on request from Kodak, Department 55W, Rochester, N.Y. 14650.



Powerful reducing agent

We do not sell lithium aluminum hydride. This mighty reducing weapon of the chemical armamentarium makes water a highly flammable liquid. The moisture left in a fingerprint becomes a threat to the brave steroid worker who knows that catalytic hydrogenation won't quite turn the trick of cleaving his epoxidized cholestene to make the equatorial alcohol, for example.

Enter VITRIDE, a trademark of National Patent Development Company for sodium bis(2-methoxyethoxy)aluminum

hydride manufactured by Realco Chemical Company. Knowing a good thing when we see it, we offer this almost equally potent bearer of active hydrogen as a 70% solution in benzene. It will dry an aprotic solvent in half an hour to absolute grade but cannot replace LiAlH_4 in the trick pictured above, a fact that should be widely appreciated by those who prefer not to regard chemistry as a perilous way of life.

Available as EASTMAN Organic Chemical No. 13112 from lab supply houses. To protect the user from overconfidence, the label says DANGER! EXTREMELY FLAMMABLE, which is, of course, true of plain benzene.



For scientists who take fun seriously

You can always tell a "pro." The effortless glide—the smooth traverse—the reflex-like reaction to changing situations...this skier and his Leicaflex® SL have a lot in common. Meticulous attention to every minute detail is what sets the Leicaflex SL apart from also-rans. The most brilliant viewfinder permits you to compose with reassuring confidence. The vibrationless shutter "winks" at the toughest situation. And a choice of 18 lenses to let you "touch" the Matterhorn. Let your carefully selected Leica® Specialist put confidence in your hands...and feel the quality of the Leicaflex SL...the camera the "pros" prefer.

E. Leitz, Inc., Rockleigh, N. J. 07647

120870



Leitz®
Leica®

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

1970

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

1971

THOMAS EISNER	NEAL MILLER
AMITAI ETZIONI	BRUCE MURRAY
EMIL HAURY	JOHN R. PIERCE
DANIEL KOSHLAND, JR.	

Editorial Staff

Editor

PHILIP H. ABELSON

Publisher

WILLIAM BEVAN

Business Manager

HANS NUSSBAUM

Managing Editor: ROBERT V. ORMES

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

Assistant to the Editor: NANCY TEIMOURIAN

News Editor: DANIEL S. GREENBERG

Foreign Editor: JOHN WALSH

News and Comment: LUTHER J. CARTER, PHILIP M. BOFFEY, CONSTANCE HOLDEN, ROBERT J. BAZELL, SCHERRAINE MACK

Research Topics: ALLEN L. HAMMOND

Book Reviews: SYLVIA EBERHART, KATHERINE LIVINGSTON, ANN BARKDOLL

Cover Editor: GRAYCE FINGER

Editorial Assistants: JOANNE BELK, ISABELLA BOULDIN, ELEANORE BUTZ, NANCY HAMILTON, CORINE HARRIS, OLIVER HEATWOLE, ANNE HOLDSWORTH, MARSHALL KATHAN, MARGARET LLOYD, VIRGINIA NUSSLE, DANIEL RABOVSKY, PATRICIA ROWE, LEAH RYAN, LOIS SCHMITT, BARBARA SHEFFER, RICHARD SOMMER, YA LI SWIGART, ALICE THEILE, MARIE WEBNER

Membership Recruitment: PATRICIA CAESAR; *Subscriptions:* BETT SEEMUND; *Addressing:* THOMAS BAZAN

Advertising Staff

Director

EARL J. SCHERAGO

Production Manager

VERA JUCHNOWICZ

Advertising Sales Manager: RICHARD L. CHARLES

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

EDITORIAL CORRESPONDENCE: 1515 Massachusetts Ave., NW, Washington, D.C. 20005. Phone: 202-387-7171. Cable: *Advancesci*, Washington. Copies of "Instructions for Contributors" can be obtained from the editorial office. See also page xv, *Science*, 25 September 1970. ADVERTISING CORRESPONDENCE: Room 1740, 11 W. 42 St., New York, N.Y. 10036. Phone: 212-PE-6-1858.

Young Scientists and the AAAS

Young scientists, including committed undergraduates, graduate students, and postdoctoral fellows, are the principal consumers of science education. They also do a significant portion of the university-based teaching and research in science. Raised in the post-Hiroshima era, they want to know how to act responsibly and how to avoid becoming the passive technical instruments of others' policies. They expect to inherit the demands of a misled public for magical solutions to unforeseen as well as ancient problems. They see that the structure of science reflects that of society and is therefore deficient in matters such as the full inclusion of minority-group members and women at all levels and the rational and humane allocation of resources. As younger citizens, they will suffer longer the irreversible effects of public (and of private industrial) policies significantly influenced by science or by a lack of science's insights.

The Committee of Young Scientists attempted last spring to find ways in which the AAAS might serve these and other needs of young scientists. The committee grew out of a significant innovation of the AAAS Board of Directors, which invited a group of young scientists to meet with it in October 1969. The young scientists requested the opportunity to report to the Board on matters of major concern to young scientists. Their work culminated in a report containing specific recommendations for a variety of programmatic and institutional changes in the AAAS. Informing the report were the beliefs that the unique multi- and interdisciplinary resources of the AAAS should be extended to science institutions and education; that local organization, meaningful membership which structures and elicits member activity, and a democratic organization would enhance the purposes of the AAAS; and that active participation of members is necessary to render the AAAS potent in effecting public policy and in promoting better understanding of science by the public.

Accordingly, the Committee of Young Scientists recommended that regional AAAS offices catalyze and support multiple experiments in education concerning the responsibility of scientists, their varied roles in society, and interdisciplinary approaches to major problems. They urged structural changes in the AAAS to make its governing council less cumbersome and to make the Board of Directors even more responsive than it is now, by direct election of members. They recommended continued involvement of young people at all levels of the AAAS. They suggested expansion of debate in *Science* on controversial matters of science and society, and creation of a new type of newspaper column of science controversy. They urged formation of a committee of minority-group scientists. They made many suggestions designed to increase the interest of young scientists in the AAAS. Finally, they urged that the issues they raised be actively debated in the pages of *Science*.

The Board of Directors acted promptly on several of the recommendations. They formed a committee of minority-group scientists. They created a council of young scientists and assigned each to a significant AAAS committee. They then referred most of the other recommendations to various AAAS committees. They also shifted their approach from one of asking for consultation with the young scientists to requests for their active participation in specific projects.

The Youth Council now plans to present its coordinated goals to diverse committees and hopes to get action through these channels. Its members will participate actively in the annual meetings. But further progress will depend on the initiative demonstrated by other young scientists as well as by AAAS members (readers of *Science*).

—MACK LIPKIN, JR., AAAS Youth Council

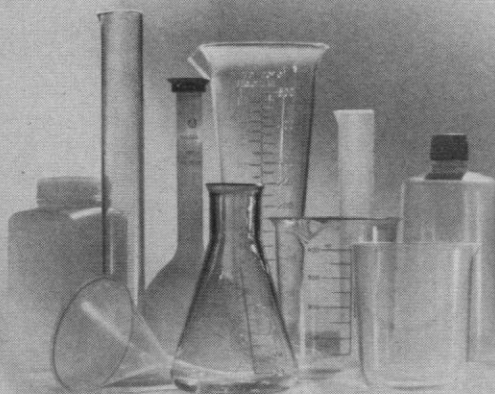
Nalgene labware won't shatter your lab budget.

Shattered labware means unnecessary replacement costs. You can save that money by specifying the permanent replacements—unbreakable Nalgene Labware.

Over 170 precision-designed Nalgene Labware items meet practically every lab application. Select the material you need: transparent TPX and polycarbonate, indestructible Teflon, translucent polyethylene and polypropylene. When you need calibrated ware, Nalgene Labware meets or surpasses glass accuracy requirements, and autoclavability is no problem.

Your initial cost is comparable to the labware that breaks. But because Nalgene Labware is more durable than glass, you'll save money through longer, safer equipment life.

Next time you order, specify the permanent replacements—unbreakable Nalgene Labware.



BUDGET



Nalgene® Labware...the permanent replacements.

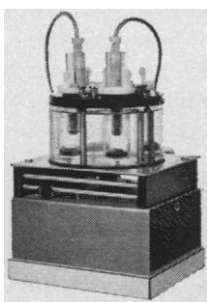
Order Nalgene Labware from your Laboratory Supply Dealer. Ask for our Catalog or write Dept. 8523, Nalgene Labware Division, Rochester, N.Y. 14602.

The Solution To Oxygen Uptake & Evolution

Uptake rates of 3 to 300 $\mu\text{l O}_2/\text{hr}$ can be monitored with 1% accuracy on YSI oxygen instruments, and the curves plotted on most 100 mv recorders.

You can use extra small samples, as little as 1 ml of substrate, add inhibitors and activators easily, and complete most experiments in 5 to 15 minutes.

Speed is up to 200 times faster, and sensitivity up to 25 times greater than manometric techniques.



Write for specs, plus a research bibliography. You'll see YSI instruments are the best solution to studies of oxygen uptake and evolution.



YELLOW SPRINGS INSTRUMENT CO.
YELLOW SPRINGS, OHIO 45387

BOOKS RECEIVED

(Continued from page 726)

Molecular Biology. Mikhail V. Vol'kenshtein. Translated from the Russian edition (Moscow, 1965) by Serge N. Timasheff. Plenum, New York, 1970. xiv, 514 pp., illus. \$15.

Myeloproliferative Disorders of Animals and Man. Proceedings of an annual symposium, Richland, Wash., May 1968. W. J. Clarke, E. B. Howard, and P. L. Hackett, Eds. U.S. Atomic Energy Commission, Oak Ridge, Tenn., 1970 (available as CONF-680529 from the Clearinghouse for Federal Scientific and Technical Information, Springfield, Va.). xii, 768 pp., illus. Paper, \$3.

Nasca Gravelots in the Uhle Collection from the Ica Valley, Peru. Donald A. Proulx. Department of Anthropology, University of Massachusetts, Amherst, 1970. viii, 104 pp., illus. + plates. Paper. Anthropology Department Research Reports No. 5.

New Math Puzzle Book. L. H. Longley-Cook. Van Nostrand Reinhold, New York, 1970. x, 176 pp., illus. \$4.95.

Occurrence of Pesticides in Aquatic Environments. Part 1, Insecticide Distribution on an Agricultural Plot. Ervin Hindin and Paul J. Bennett. Technical Extension Service, Washington State University, Pullman, 1970. xii, 46 pp., illus. Paper. College of Engineering, Bulletin 317.

Operational Calculus. Gregers Krabbe. Springer-Verlag, New York, 1970. xvi, 350 pp., illus. \$14.90.

The Organization and Support of Scientific Research and Development in Mainland China. Yuan-li Wu and Robert B. Sheeks. Assisted by Lawrence J. Lau and Grace Wu; under the direction and editorial supervision of Ralph J. Watkins. Published for the National Science Foundation by Praeger, New York, 1970. xxvi, 594 pp., illus. \$17.50. Praeger Special Studies in International Economics and Development.

Parametric Processes. A. Yariv and J. E. Pearson. Pergamon, New York, 1969. iv, 50 pp., illus. Paper, \$2.75. Progress in Quantum Electronics, vol. 1, part 1.

The Path of the Pole. Charles H. Hapgood. Chilton, Philadelphia, 1970. xxviii, 414 pp., illus. \$14.95.

The Pathology of Leadership. Hugh L'Etang. Hawthorn, New York, 1970. vi, 218 pp. \$6.95.

The Paths of Culture. A General Ethnology. Kaj Birket-Smith. Translated from the Danish by Karin Fennow. University of Wisconsin Press, Madison, 1965. xii, 536 pp. + plates. Cloth, \$10; paper, \$2.95.

Photophysiology. Current Topics in Photobiology and Photochemistry. Vol. 5. Arthur C. Giese, Ed. Academic Press, New York, 1970. xviii, 290 pp., illus. \$15.50.

Physical Properties of Plant and Animal Materials. Vol. 1, Structure, Physical Characteristics and Mechanical Properties. Nuri N. Mohsenin. Gordon and Breach, New York, 1970. xvi, 734 pp., illus. \$24.50; to libraries, \$45.

The Physiology and Biochemistry of Muscle as a Food. Vol. 2. Proceedings of

an international symposium, Madison, Wis., July 1969. E. J. Briskey, R. G. Casens, and B. B. Marsh, Eds. University of Wisconsin Press, Madison, 1970, xvi, 844 pp., illus. \$20.

Physiology and Pharmacology of Local Anesthesia. Rudolph H. de Jong. Thomas, Springfield, Ill., 1970. xiv, 268 pp., illus. \$12.50.

The Physiology of Insect Reproduction. Franz Engelmann. Pergamon, New York, 1970. x, 308 pp., illus. \$18.75.

Phytochemical Phylogeny. Proceedings of a symposium, Bristol, England, April 1969. J. B. Harborne, Ed. Academic Press, New York, 1970. xvi, 336 pp., illus. \$16.50.

Pictorial Guide to the Birds of North America. Text and photographs by Leonard Lee Rue III. Crowell, New York, 1970. xviii, 368 pp. \$12.50.

Pleneurethic. R. B. Collier. Published by the author, Rama Hotel, Bangkok, 1969. Vol. 3, viii, 228 pp.; vol. 5, x, 196 pp.

Principles of Aerosol Technology. Paul A. Sanders. Van Nostrand Reinhold, New York, 1970. x, 418 pp., illus. \$17.50.

Principles of Lithogenesis. Vol. 2. N. M. Strakhov. Translated from the Russian edition (Moscow, 1962) by J. Paul Fitzsimmons. S. I. Tomkeieff and J. E. Hemingway, Eds. Consultants Bureau, New York; Oliver and Boyd, Edinburgh, 1969. xii, 610 pp., illus. + plates. \$35.

Proceedings of the Fourth Asian-Pacific Congress of Cardiology, Jerusalem and Tel Aviv, Israel, September 1968. Marcel Eliakim, Ed. Academic Press, New York, 1969. 516 pp., illus. \$24.50.

Proceedings of International Symposium on Sensory Evaluation of Food. Principles and Methods. Kungälv (near Göteborg), Sweden, September 1968. B. Drake, Ed. Swedish Institute for Food Preservation Research, Göteborg, 1969. 56 pp. Paper.

Processing of Optical Data by Organisms and by Machines. Proceedings of the International School of Physics "Enrico Fermi," Course 43, Varenna, Italy, July 1968. W. Reichardt, Ed. Academic Press, New York, 1969. xviii, 616 pp., illus. \$28.50.

A Propos du Mécanisme Terrestre. Georges Dubourdieu. Imprimerie du Neubourg, Le Neubourg, France, 1970. 70 pp. illus. Paper.

Psychoanalysis and Interpersonal Psychiatry. The Contributions of Harry Stack Sullivan. Patrick Mullahy. Science House, New York, 1970. xvi, 752 pp. \$15.

The Psychology of Gambling. Edmund Bergler. International Universities Press, New York, 1970. xii, 244 pp. \$7.50. Reprint of the 1957 edition.

Quantum Optics. Proceedings of the International School of Physics "Enrico Fermi," Course 42, Varenna, Italy, 1967. R. J. Glauber, Ed. Academic Press, New York, 1969. xx, 762 pp., illus. \$31.

Recent Advances in Phytochemistry. Vol. 3. Proceedings of an annual symposium, Tucson, Ariz., June 1968. Cornelius Steelink and V. C. Runeckles, Eds. Appleton-Century-Crofts (Meredith), New York, 1970. xvi, 268 pp., illus. \$14.50.

Satellites and Probes. The Development