

SCIENCE

26 November 1971

Vol. 174, No. 4012

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

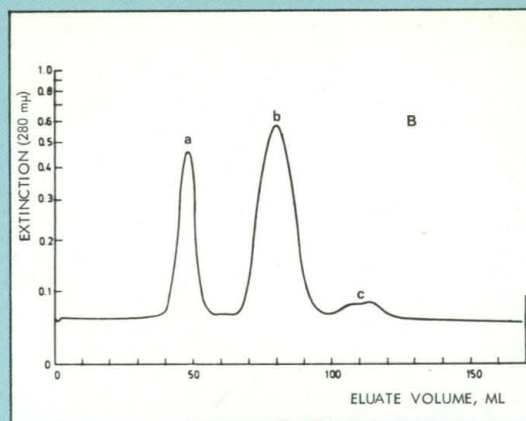


SEPARATION ON POLYACRYLAMIDE GEL
 Column stabilised with 5 % polyacrylamide. Cross circulation of buffer.
 Continuous elution 10 ml/hr. Temperature 4° C.
 SAMPLE: 0.25 ml 20 % albumin solution 0.04-M with respect to acetyl-
 tryptophane + 0.75 ml electrode buffer.

LKB

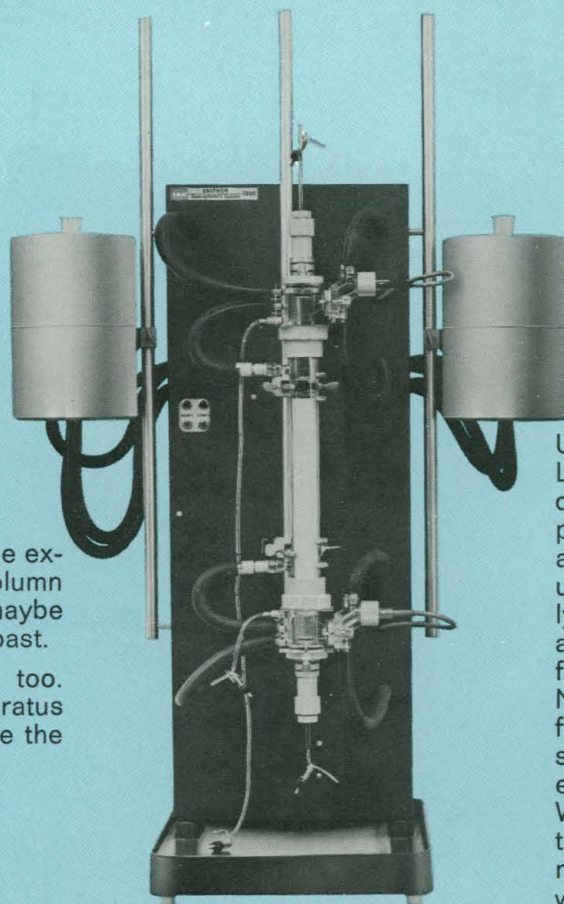
IN THE SERVICE OF SCIENCE

LKB INSTRUMENTS INC. 12221 PARKLAWN DRIVE, ROCKVILLE MD. 20852
 11744 WILSHIRE BLVD. LOS ANGELES CALIF. 90025
 6600 WEST IRVING PARK ROAD, CHICAGO, ILL. 60634
 260 NORTH BROADWAY, HICKSVILLE, N.Y. 11800



One Instrument for Four – UNIPHOR

POLYACRYLAMIDE SEPARATIONS TOO!



The LKB Uniphor can save the expense of four other sets of column electrophoresis apparatus, maybe more, but we don't want to boast.

Consider the convenience too. With one piece of LKB apparatus protein chemists can now use the following techniques:

- Powder stabilization
- Sucrose Density Gradient
- Isoelectric Focusing
- Polyacrylamide Gel
- Agarose Gel
- Sephadex

Unique on the market today, the LKB Uniphor permits a free choice of method and provides a completely flexible system in which any stabilization medium can be used. The Elution Stopper, for Polyacrylamide Gel separations, enables the continuous removal of fractionated zones.

No need to remove the gel column from the Uniphor and cut out the separated components for further examination.

Write LKB today for **one** brochure telling you in detail about **four**, and more, methods that you can use with the Uniphor.

Circle No. 1 on Readers' Service Card

NALGE OFFERS YOU THE WORLD'S MOST INERT AND INDESTRUCTIBLE LABWARE (and more of it)...

Nalgene® Labware of Teflon FEP.

When the analysis is critical or the experimental conditions are severe, nothing else will do. Nalgene Labware made of unbreakable Teflon* FEP is as inert as anything known, handles *all* chemicals (except a few seldom-used compounds), and won't contaminate anything it holds. Its non-stick, easy-to-clean surface will not absorb contaminants. Use this labware from 205°C down to cryogenic temperatures, sterilize it by any method. And you can see through *this* kind of Teflon.

Make sure you have the ultimate labware *when* you need it. You buy only once because indestructible Nalgene Labware of Teflon FEP lasts indefinitely. Eight sizes of beakers, bottles from 1 to 64 oz., four wash bottles, flasks in 50 and 250 ml, separatory funnels and addition funnels in 125, 250 and 500 ml sizes.

Because your lab procedures are worth doing perfectly, Nalgene Labware of Teflon is worth using. Order from your lab supply dealer.

*Du Pont trademark



Nalgene® Labware...the permanent replacements.

Ask for our catalog containing application information, or write Dept. 4012, Nalgene Labware Division, Nalge Company, Rochester, N.Y. 14602.

Circle No. 8 on Readers' Service Card

26 November 1971

Vol. 174, No. 4012

SCIENCE

LETTERS	Understanding Man's Behavior: <i>L. S. Minckler; G. Semb; J. A. Nevin;</i> Research Grant Evaluation at NIH: <i>L. C. Mark; Spectacular Jaw:</i> <i>S. P. Applegate</i>	890
EDITORIAL	New Initiatives in Technology	895
ARTICLES	A Cartography of the Ecstatic and Meditative States: <i>R. Fischer</i>	897
	The Nation's Rivers: <i>M. G. Wolman</i>	905
	Current Physics Information: <i>H. W. Koch</i>	918
NEWS AND COMMENT	After the Pentagon Papers: Talk with Kistiakowsky, Wiesner	923
	Institute of Medicine: Broad-Spectrum Prescription	929
	Nuclear Physics: Does Competition Breed a Monstrous Game?	932
RESEARCH TOPICS	Molecular Biology: Gene Insertion into Mammalian Cells	933
BOOK REVIEWS	<i>Use of Marijuana</i> , reviewed by <i>M. Jarvik</i> ; other reviews by <i>R. Pipes, J. H.</i> <i>Ostrom, E. Holtzman</i> ; Books Received	935

BOARD OF DIRECTORS

ATHELSTAN SPILHAUS
Retiring President, Chairman

MINA REES
President

GLENN T. SEABORG
President-Elect

DAVID BLACKWELL
RICHARD H. BOLT

LEWIS M. BRANSCOMB
BARRY COMMONER

VICE PRESIDENTS AND SECTION SECRETARIES

MATHEMATICS (A)
Henry O. Pollak
F. A. Ficken

PHYSICS (B)
Gaylord P. Harnwell
Albert M. Stone

CHEMISTRY (C)
Charles C. Price
Leo Schubert

ASTRONOMY (D)
Laurence W. Fredrick
Arlo U. Landolt

PSYCHOLOGY (I)
James E. Deese
William D. Garvey

SOCIAL AND ECONOMIC SCIENCES (K)
Daniel P. Moynihan
Harvey Sapolsky

HISTORY AND PHILOSOPHY OF SCIENCE (L)
Cyril Smith
Raymond J. Seeger

PHARMACEUTICAL SCIENCES (Np)
Wallace L. Guess
John Autian

AGRICULTURE (O)
Matthias Stelly
Michael A. Farrell

INDUSTRIAL SCIENCE (P)
Burton V. Dean
Jordan D. Lewis

EDUCATION (Q)
J. David Lockard
Phillip R. Fordyce

DIVISIONS

ALASKA DIVISION

Laurence Iving
President

Irma Duncan
Executive Secretary

PACIFIC DIVISION

George E. Lindsay
President

Robert C. Miller
Secretary

SOUTHWESTERN AND ROCKY MOUNTAIN DIVISION

John R. Lacher
President

Marlowe G. Anderson
Executive Secretary

SCIENCE is published weekly, except the last week in December, but with an extra issue on the third 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. Copyright © 1971 by the American Association for the Advancement of Science. Annual subscription \$20; foreign postage: Americas \$3; overseas \$5; air freight to Europe, North America, Near East \$16; single copies \$1 (back issues, \$2) except *Guide to Scientific Instruments* which is \$4. School year subscription: 9 months, \$15; 10 months, \$16.75. 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

REPORTS	Jupiter: An Unidentified Feature in the 5-Micron Spectrum of the North Equatorial Belt: <i>G. Münch and G. Neugebauer</i>	940
	Particle Formation during Water-Vapor Photolysis: <i>I. D. Clark and J. F. Noxon</i>	941
	Mars: Has Nitrogen Escaped?: <i>R. T. Brinkmann</i>	944
	Ice Nucleation by Coprecipitated Silver Iodide and Silver Bromide: <i>B. Vonnegut and H. Chessin</i>	945
	Microanalysis of Individual Mitochondrial Granules with Diameters Less than 1000 Angstroms: <i>L. V. Sutfin, M. E. Holtrop, R. E. Ogilvie</i>	947
	Strontium Induced Rickets: Metabolic Basis: <i>J. L. Omdahl and H. F. DeLuca</i>	949
	6-Hydroxy- Δ^1 -Tetrahydrocannabinol Synthesis and Biological Activity: <i>Z. Ben-Zvi et al.</i>	951
	Galactose Toxicity in the Chick: Hyperosmolality: <i>J. I. Malone, H. J. Wells, S. Segal</i>	952
	Prenatal Cerebral Development: Effect of Restricted Diet, Reversal by Growth Hormone: <i>S. Zamenof, E. van Marthens, L. Grauel</i>	954
	Strontium Accumulation by Sarcoplasmic Reticulum and Mitochondria in Vascular Smooth Muscle: <i>A. V. Somlyo and A. P. Somlyo</i>	955
	Stereoscopic Depth Movement: Two Eyes Less Sensitive than One: <i>C. W. Tyler</i>	958
	<i>Technical Comments:</i> Growth Inhibition by Mechanical Stress: <i>R. Turgeon and J. A. Webb</i> ; Arctic Paleo-Oceanography in Late Cenozoic Time: <i>K. Hunkins et al.</i> ; <i>Y. Herman</i>	961
ASSOCIATION AFFAIRS	Ocean Symposium: <i>H. B. Stewart, Jr.</i> ; Technology and Growth in a Resource Limited World; A Search for the Recognizable Goals and Constraints of the Steady State Earth	964

CARYL P. HASKINS
PHYLLIS V. PARKINS

LEONARD M. RIESER
KENNETH V. THIMANN

WILLIAM T. GOLDEN
Treasurer

WILLIAM BEVAN
Executive Officer

GEOLOGY AND GEOGRAPHY (E)
Ellis L. Yochelson
William E. Benson

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

INFORMATION AND
COMMUNICATION (T)
Edward L. Brady
Scott Adams

MEDICAL SCIENCES (N)
George B. Koelle
F. Douglas Lawrason

STATISTICS (U)
Elizabeth Scott
Ezra Galser

BIOLOGICAL SCIENCES (FG)
George Sprugel, Jr.
Richard J. Goss

DENTISTRY (Nd)
Henry W. Scherp
Sholom Pearlman

ATMOSPHERIC AND HYDROSPHERIC
SCIENCES (W)
Thomas F. Malone
Louis J. Battan

ANTHROPOLOGY (H)
Ward Goodenough
Anthony Leeds

COVER

Etching, made during an acute schizophrenic episode, demonstrates the contraction of nearby visual space, which results in a raised horizon (original drawing, 130 x 100 millimeters). See page 897. [Photograph courtesy of Leo Navratil, Niederösterreichisches Landeskrankenhaus für Psychiatrie und Neurologie, Klosterneuburg, Austria]

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.



Accept No Substitutes!

The New HP Series 9800 is the best programmable calculator system now—and in the foreseeable future. Price. Performance. Simplicity of operation. No matter what criterion you use, there is absolutely no other system on the market that can match the Series 9800.

Only HP Offers You All This For The Low Price Of \$2975

To build your personal desk-top computing system, start with the Series 9800/Model 10 Programmable Calculator. Your basic Model 10 comes with standard equipment that is either not available, or available only as an extra-cost option, on other machines.

If bad experiences have taught you that basic is synonymous with stripped—have no fear. The *basic* Model 10 can perform a complete regression analysis, or solve a system of 10 simultaneous equations.

Only HP Offers You A Fully Modular Calculator

The unique, modular/plug-in architecture of the Model 10 lets you “design” your own problem-solving system. You can expand the memory, add peripherals, or change the keyboard of your existing Model 10, at any time.

Only HP Gives You A Fully Expandable Dual Memory

The Model 10 has a unique dual memory system—one memory for programs and one for data. You can expand from the basic 500 program steps *and* 51 data registers to 2036 program steps *and* 111 data registers.

Beware of simple number comparisons with other calculators. The refinements in the memory design and the keyboard make the Model 10 so efficient that in most cases it requires *fewer steps to execute a given problem*.

Only HP Lets You Design Your Own Keyboard

Interchangeable keyboard plug-in blocks give you a choice of powerful *Statistics* or *Mathematics* functions, complete with their own memories, under single keystroke command. Another option, the *User Definable Function* plug-in, lets *you* customize individual keys with operations uniquely important to *you*.

Only HP Offers An Alphanumeric Printer

By simply inserting the *exclusive HP Alphanumeric Printer Plug-in*, you can automatically generate labels, program instructions, or messages—in English—right on the printer tape.

Only HP Gives You A Wide Choice of Sophisticated Peripherals

The I/O bus of the Model 10 lets you plug-in a Marked Card Reader, Paper Tape Reader, Digitizer, Typewriter, Tape Cassette, or the *exclusive X-Y Plotter* that plots linear, log-log, semi-log, or polar plots, and writes alphanumerics.

Only HP Offers You A Totally New System

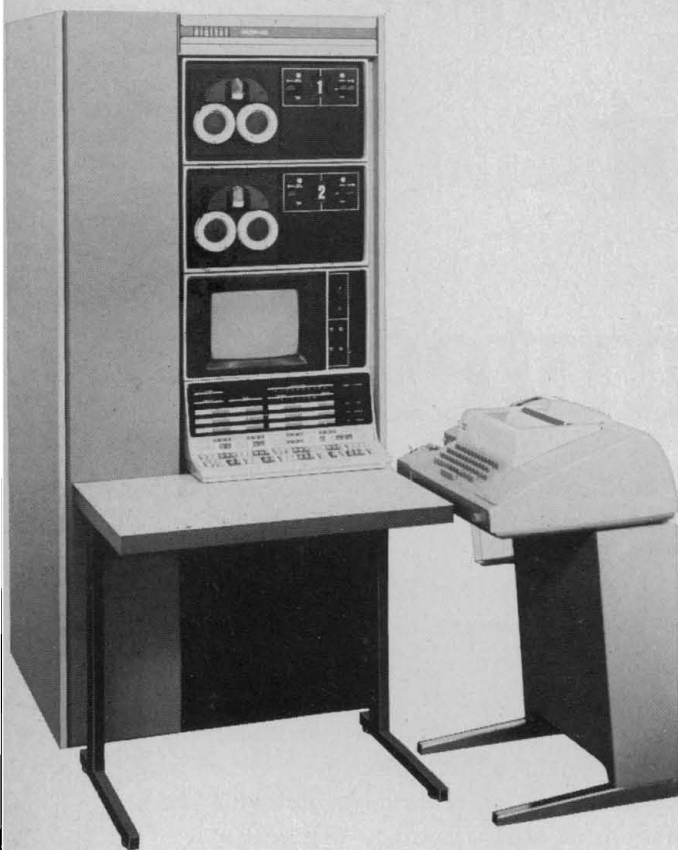
The Series 9800 is no paper tiger. It's available now to free you from the drudgery of problem-solving so you can get on with your job of innovative thinking and designing. For more information or a “hands-on demonstration” at your desk, write: Hewlett-Packard, P.O. Box 301, Loveland, Colorado 80537. In Europe: 1217 Meyrin-Geneva Switzerland.

Circle No. 6 on Readers' Service Card

CO911/S



CALCULATOR PRODUCTS



Before



After

You'd hardly recognize the new PDP-12.

PDP-12 always was a beautiful lab computer. Powerful. Versatile. Easy to use. With a huge library of software. And a history of reliability that just won't quit.

But the new PDP-12 is so much more of a computer that you'd hardly recognize it.

Now you can get FORTRAN IV. A full blown ASA Standard, Level G.

Also, a Floating Point Processor

that does calculations 100 times faster than software.

And a 15 level Automatic Hardware Priority Interrupt that gives you enormous flexibility in responding to real-time events.

And 128 input channels. Twice as many as before.

And a faster, higher resolution A/D converter.

And a 36,000 CPS magnetic tape unit. The TU-10.

And a superfast, superquiet dot matrix printer. The LA-30.

Even a two-color display. Our VR-20.

It's all here. Ready to go. On the new PDP-12.

Get it all. But first get the literature. Write Laboratory Data Products Group, Digital Equipment Corporation, 146 Main Street, Maynard, Massachusetts 01754. (617) 897-5111.

digital

Circle No. 3 on Readers' Service Card

From Brinkmann... several ingenious ways to improve the versatility of your present TLC system.

Doing thin-layer chromatography? Imagine how much more versatile and efficient your present system could be with these outstanding Brinkmann TLC accessories.

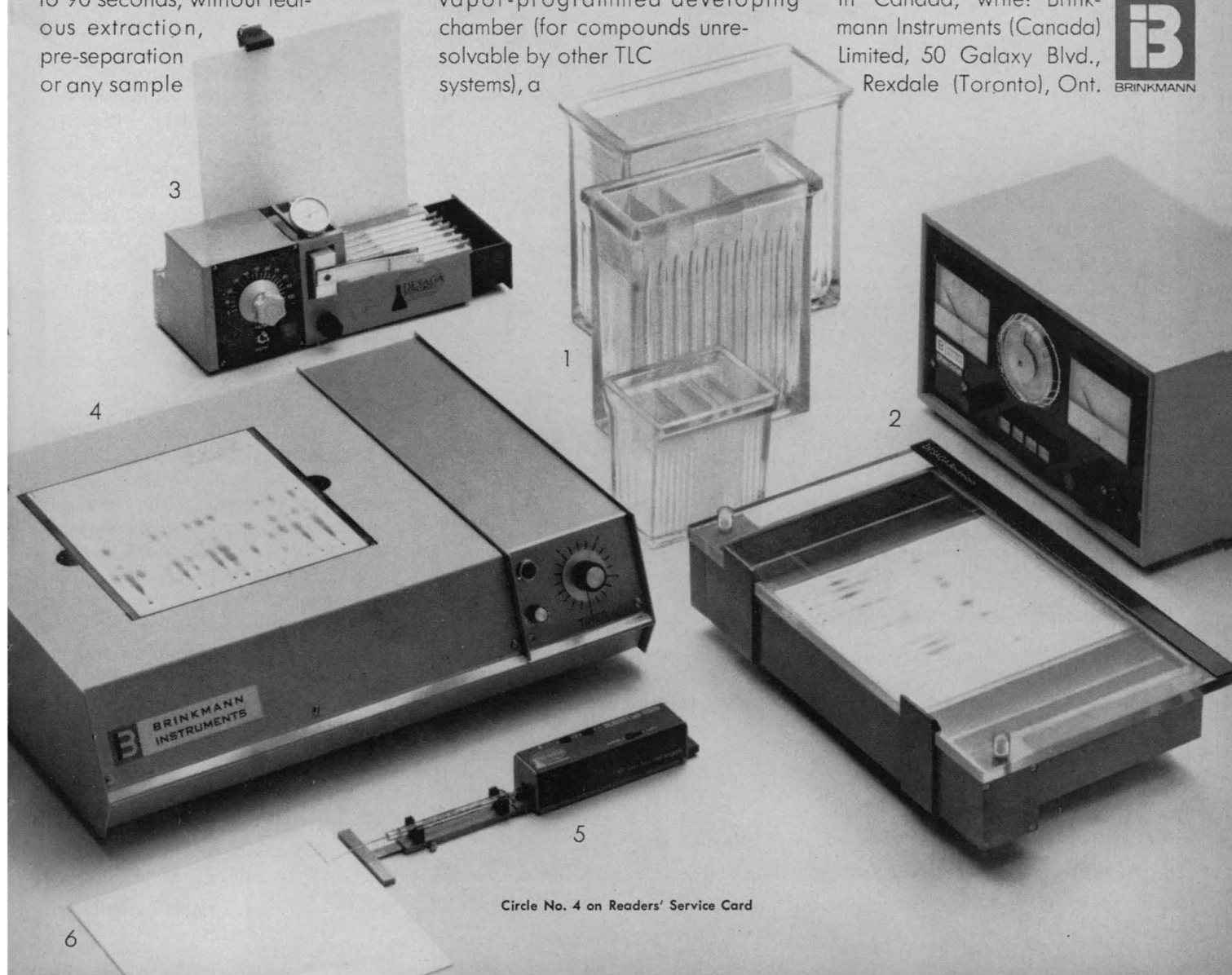
For example, our glass Multiplate Tanks (1) let you develop several 5x10, 5x20 or 20x20 cm TLC plates simultaneously. Our Migration Chamber (2) utilizes sorbent layers for superior electrophoretic separations. Our TAS Oven (3) will extract and spot volatile substances in just 15 to 90 seconds, without tedious extraction, pre-separation or any sample

transfer. Our Photocopier (4) duplicates TLC chromatograms by a dry process with better contrast and at less cost than electrostatic or photographic methods. Our Microdoser (5) with 2-speed, battery-powered motor is ideal for sample streaking of TLC plates. And speaking of plates, our pre-coated TLC plates (6) are famous for their exceptionally smooth, abrasion-resistant coatings and are guaranteed against flaking.

What else? We have a new vapor-programmed developing chamber (for compounds unsolvable by other TLC systems), a

new multi-solvent evaluation chamber (for fast-testing of different solvent systems), new self-filling microliter capillaries (to facilitate spotting TLC samples), new clinical TLC analysis kits (for drug abuse, amino acid and many other determinations), and apparatus for quantitative and particle-free elutions from TLC layers.

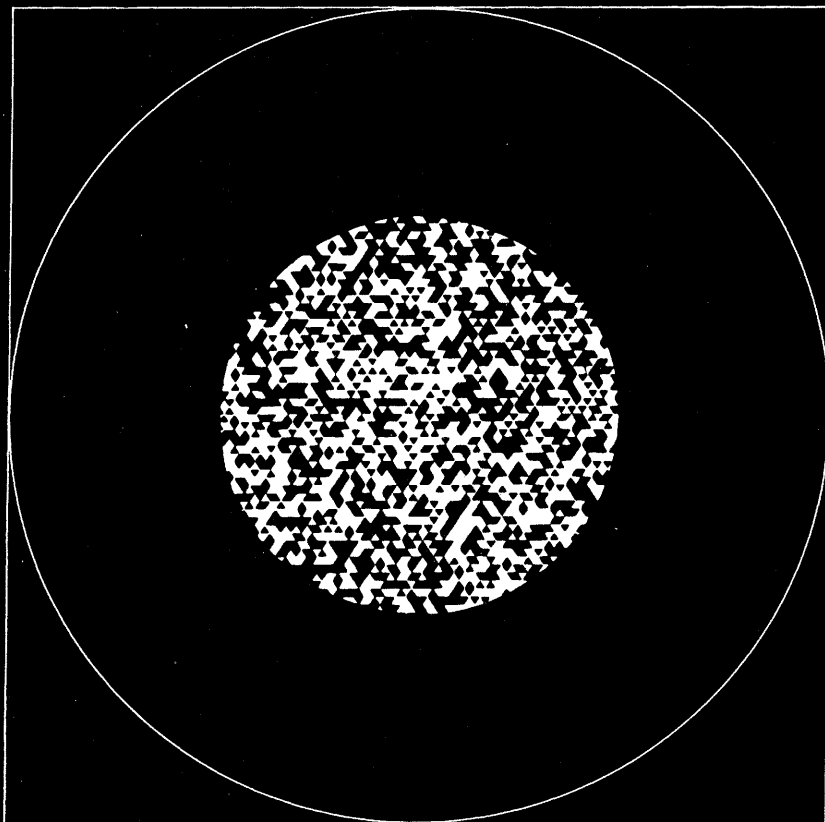
For descriptive literature on any of these TLC accessories, just write: Brinkmann Instruments, Cantiague Road, Westbury, New York 11590. In Canada, write: Brinkmann Instruments (Canada) Limited, 50 Galaxy Blvd., Rexdale (Toronto), Ont.



Circle No. 4 on Readers' Service Card

"The mythical cyclops looked out on the world through a single eye in the middle of his forehead. We, too, in a sense, perceive the world with a single eye in the middle of the head. But our cyclopean eye sits not in the forehead but rather some distance behind it in the areas of the brain that are devoted to visual perception."—from the Preface

Foundations of Cyclopean Perception



Bela Julesz, head of the sensory and perceptual processes department of the Bell Telephone Laboratories, presents, in a magnificently illustrated book, the insights into the "black box" of the visual system that have been gained by research of the past decade—research in which he has been a leading figure. He has established, by psychological methods alone, that human depth perception is a central process taking place at a precisely located site within the visual cortex, the "cyclopean retina."

Using computers to generate complex random-dot patterns, such as the one above, Julesz has created visual information which bypasses the outer, or anatomical, retina and directly stimulates the central cells within the brain which fuse monocular input from each eye to produce binocular depth perception.

This book presents the cyclopean methodology developed by Julesz and others, and his model of stereopsis is published here for the first time. Some of the findings in this work are relevant to cognition (localization of eidetic memory, perceptual learning, etc.). Others bear on purely "sensory" processes (localization of simultaneous contrasts and color phenomena).

Neurophysiologists, experimental psychologists, and ophthalmologists will find this book has rich implications for immediate use and for further research. Clinicians can use the Julesz patterns as test plates for locating and quantifying stereopsis deficiency. Julesz' work is already well-known to many artists interested in computer-generated art forms. The beauty of the reproduced plates and the excitement of perceiving the forms that float out from the seemingly meaningless patterns will delight the layman or student of the visual arts.

With over 400 computer-generated black-and-white stereograms and 97 anaglyphs on precision-printed color plates. Red and green stereo viewers included in the book. \$20.00

The University of Chicago Press Chicago 60637

LETTERS

Understanding Man's Behavior

Constance Holden reports (News and Comment, 17 Sept., p. 111) that psychologists are beset by feelings of futility and self-doubt. I don't wonder! As a biologically oriented scientist who has raised seven children over the past 40 years, I have also been beset by doubts and sheer disbelief of much of psychology for the last 20 of those years. A parent must finally throw up his hands and decide that grandma and grandpa know best after all. At least they have some unity and consistency in their ideas of family relations.

What a golden opportunity psychologists have had! The public has eagerly sought and read their latest pronouncements. People have tried to put psychology into practice, often with unfortunate results. Theories of child rearing have changed so fast that a whole generation (mostly confined to the educated classes) has been raised without fully consistent and secure parental guidance. What else can be expected from a science that has tended to de-emphasize and even disregard the biological contribution to human behavior and the vast biological diversity of humans? How can a science of "the mind" prosper when it sometimes forgets that the brain is a biochemical and biophysical organ that does not respond to environmental stimuli in the same way in different individuals, and furthermore often forgets that many of these differences are inherent?

It is ironic that Skinner and Clark, the men Holden cites as believing they have some answers, should take such completely different approaches. Skinner "believes that all of man's behavior is determined by his environment." He would condition each and every one of us to be good boys and girls. Clark, on the other hand, assumes some biological basis for behavior when he advocates the use of mind-affecting drugs to make our leaders behave.

These prescriptions sound like nonsense to this nonpsychologist and will plunge psychology even deeper into futility and self-doubt. Psychologists need a "comprehensive theoretical model" that includes the fact that the human brain is a highly diversified biochemical and biophysical organ, developed over a million years of human evolution. Man's behavior will not really be understood until the nature and ramifications

of the biological-spiritual brain (human nature?) are better understood. In the meantime let's keep in mind that all men are *not* created equal. This will save much time and effort and many tears.

LEON S. MINCKLER
State University College of Forestry
at Syracuse University,
Syracuse, New York 13210

In the account of the annual meetings of the American Psychological Association, Holden states that operant conditioning refers to the stimulus response techniques first developed by Pavlov. It should be pointed out that operant conditioning refers to the stimulus-response-reinforcement techniques first described by B. F. Skinner in 1938 (1).

The distinction between Pavlovian (respondent) conditioning and Skinner's operant conditioning is an important one. Skinner contends, and his contentions are supported by a wealth of experimental data from the field of behavior analysis, that behavior is controlled by the consequences it produces in the environment. Pavlov was the first to demonstrate that certain behaviors (primarily reflexes) are elicited by specific antecedent stimuli. Skinner, on the other hand, was the first to explain systematically how most behaviors (primarily social and verbal) are controlled by their consequences.

GEORGE SEMB
Department of Human Development,
University of Kansas,
Lawrence 66044

Reference

B. F. Skinner, *The Behavior of Organisms* (Appleton-Century-Crofts, New York, 1938).

Pavlov's stimulus-response techniques involve the pairing of a neutral stimulus with a stimulus that regularly elicits a response, such as food (which elicits salivation) or shock (which elicits diffuse "emotional" responses). The food or shock is presented without regard for the organism's behavior.

Operant conditioning procedures differ from Pavlov's in that the organism's behavior determines whether a stimulus such as food or shock will be presented. In a standard operant conditioning experiment, the rate at which a rat will press a bar depends on whether bar-pressing is followed by food or shock, and, conversely, the occurrence of food or shock depends on bar-pressing. Thus, the organism affects its environment, as well as being affected by it. This aspect

A is for Actinium-227

In between are 103 other radionuclides in our current stock, all described in a 28-page catalog. It's the widest line available.

That makes us the handiest source of radionuclides, but not necessarily the best. What makes us the best is our determination to ship the highest quality compounds in the safest, most convenient package. We do this by subjecting our nuclide solutions to the most rigorous quality control in the industry. Production-processing and analytical data accompany each shipment, including an X-ray or gamma spectrum if it's a photon emitter.

Ask for the catalog and keep it handy. Besides the radionuclides, it describes our custom irradiation services, gamma and beta reference source sets, radionuclide generators, and classroom isotope generators.

Leak-proof combi-vial
with protective sleeve



New England Nuclear

575 Albany Street, Boston, Mass. 02118
Customer Service: (617) 482-9595

S

JBC

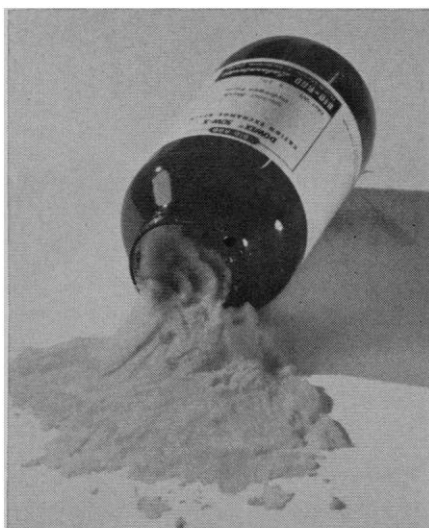
AL

PT

R&I

Z is for Zinc-65

Circle No. 31 on Readers' Service Card



BIO-RAD stocks DOWEX® ion exchange resins, anion and cation, in 44 types and bead sizes.

For immediate shipment!

Need we say more? Only that BIO-RAD's AG® resins—the research standard of excellence—are also available for those applications requiring the highest chemical purity. For details on DOWEX and AG, send for our new complete catalog and price list.

BIO-RAD Laboratories

32nd & Griffin Ave.
Richmond, Cal. 94804
(415) 234-4130

220 Maple Ave.
Rockville Centre, NY 11570
(516) 764-2575

Circle No. 79 on Readers' Service Card

of operant conditioning is especially important when the environment includes other organisms—each affects the other and is affected by the other, so that they enter into the reciprocal controlling relations which are the essence of social interaction. Operant conditioning provides a way of understanding these interactions; Pavlovian conditioning, although important in the analysis of behavior, cannot incorporate reciprocal organism-environment interactions.

JOHN A. NEVIN

*Department of Psychology,
Columbia University,
New York 10027*

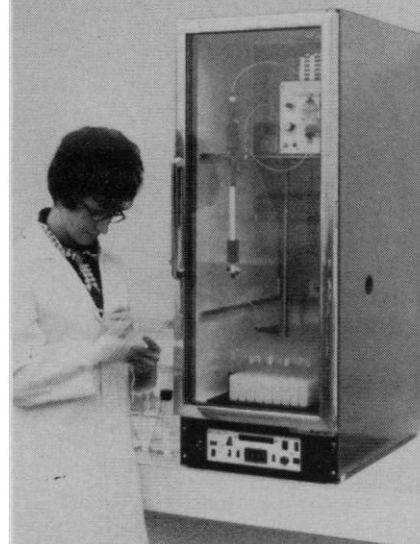
Research Grant Evaluation at NIH

Gross (Letters, 9 July, p. 106) expresses sincere but misguided concern for the viability of the National Institutes of Health (NIH) system of research grant evaluation. He considers that "the growth of NIH center grants and contracts . . . not now reviewed by study sections" (but by special committees instead) is an effort to bypass the present system of quality control and provide safe, easy cover for individual investigators. Others, on the contrary, have privately voiced fears that worthy center and program-project grant applications may not be approved if they include less meritorious projects. Both views underestimate the strength and wisdom of the peer review system. Indeed, experience with one special committee, the Pharmacology-Toxicology Program Committee, has been reassuring.

Each institution applying for program-project, center, or contract funds is first rigorously inspected by a site-visit team of experts from the committee, suitably reinforced as needed by outside ad hoc consultants to ensure coverage in depth of all aspects of the proposal. The question recurs, "Is this truly a program (or a center), or is it merely an umbrella to cover the research of the department?" The component research projects are minutely scrutinized for both scientific merit and relevance to the aims of the program or center; projects lacking in either criterion are pruned from both the application and the budget in a consensus report prepared by the site visitors.

The committee members on the site-visit team then bring their report to

cold room chromatography without a cold room



This tabletop refrigerated fraction collector will fit practically anywhere in your lab. 210 test tubes from 10 to 18 mm diameter are held in removable racks which move in timed, counted drop, or volumetric increments. Cleaning is easy with the lift out, submersible mechanism and smooth molded interior. The cabinet has a brushed stainless steel exterior and double pane full size glass door. Columns with a maximum length of 1 meter can be clamped to removable sliding wire racks, which also hold buffer reservoirs, pumps, and general cold storage items.

At \$1600 an ISCO refrigerated fraction collector is hardly more expensive than popular unrefrigerated units. It is described in our general catalog, with other ISCO equipment for chromatography, density gradient fractionation, electrophoresis, and other biochemical laboratory techniques. Your copy is waiting for you.



**INSTRUMENTATION
SPECIALTIES COMPANY**

4700 SUPERIOR LINCOLN, NEBRASKA 68504
PHONE (402) 434-0231 TELEX 48-6453

Circle No. 77 on Readers' Service Card

the full committee, which proceeds to challenge it mercilessly, point by point. Unless adequately defended by the site visitors, the proposal may be further modified or even rejected altogether. If accepted, with or without change, it is assigned a priority and forwarded to the (appropriate) National Advisory Council for implementation. (In today's climate of budgetary austerity, alas, only those proposals approved with sufficiently high priority can be funded.)

I have found all colleagues on this committee to be a group of hard-working, hard-nosed, penny-pinching scientists, adept at winnowing wheat from chaff. Thanks to such zeal and dedication, the peer review system continues to flourish.

LESTER C. MARK

*Department of Anesthesiology,
College of Physicians and
Surgeons, Columbia University,
New York 10032*

Spectacular Jaw

It was nice to see the fine old American Museum of Natural History photograph (cover, 8 Oct.) of the reconstructed *Carcharodon megalodon* jaw. It is certainly a spectacular picture, but it should be stated that the jaw is actually much too big. If the teeth in the fossil were like those in the recent species of this genus, they would diminish in size as they approach the corners of the jaw. However, this is not the case in this specimen, probably because the preparators used the largest teeth they could find to make the most spectacular jaw. Most of the teeth that are shown in this jaw come from the second anterior position of the upper jaw. These are the largest teeth that the recent "great white" has, and this must have applied as well to the fossil. It would be a similar faux pas to reconstruct a saber-tooth cat using their canines or sabers for all the teeth. We would end up with a terrifically large-jawed cat.

If the proper lateral and posterior teeth had been used in this shark-jaw reconstruction, it would reduce the size of this *Carcharodon* jaw by at least one-third. The reconstruction would still be large, but not nearly as large as the one in the photograph.

SHELTON P. APPLIGATE

*Los Angeles County Museum
of Natural History,
Los Angeles, California 90007*

26 NOVEMBER 1971

Erector-set flexibility comes to the laboratory



...with Solv-Seal™ Glass Joints

Solv-Seal Joints are leakproof under pressure, because an interference fit between Teflon™ and glass is the primary seal. They can't freeze . . . don't require cleaning. There's no grease needed; the O-rings provide a positive secondary seal. Teflon is chemically inert and non-contaminating.

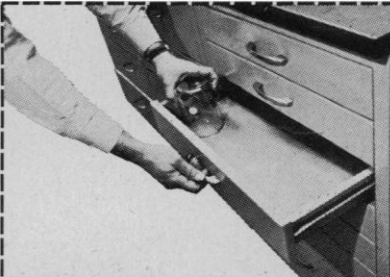
Solv-Seal Joints disconnect in seconds. They're available in seven I.D.'s from 2 mm to 50 mm. For complete details on the unique patented Solv-Seal Joint, write to Fischer & Porter Co., 8010 County Line Road, Warminster, Pa. 18974.



Lab-Crest **Glassware**
by Fischer & Porter

Circle No. 80 on Readers' Service Card

Cantiflex™...lab furniture's



BLICKMAN

SINCE 1889

S. Blickman, Inc.
6911 Gregory Avenue
Weehawken, N.J. 07087

Yes, I'd like details on Cantiflex.

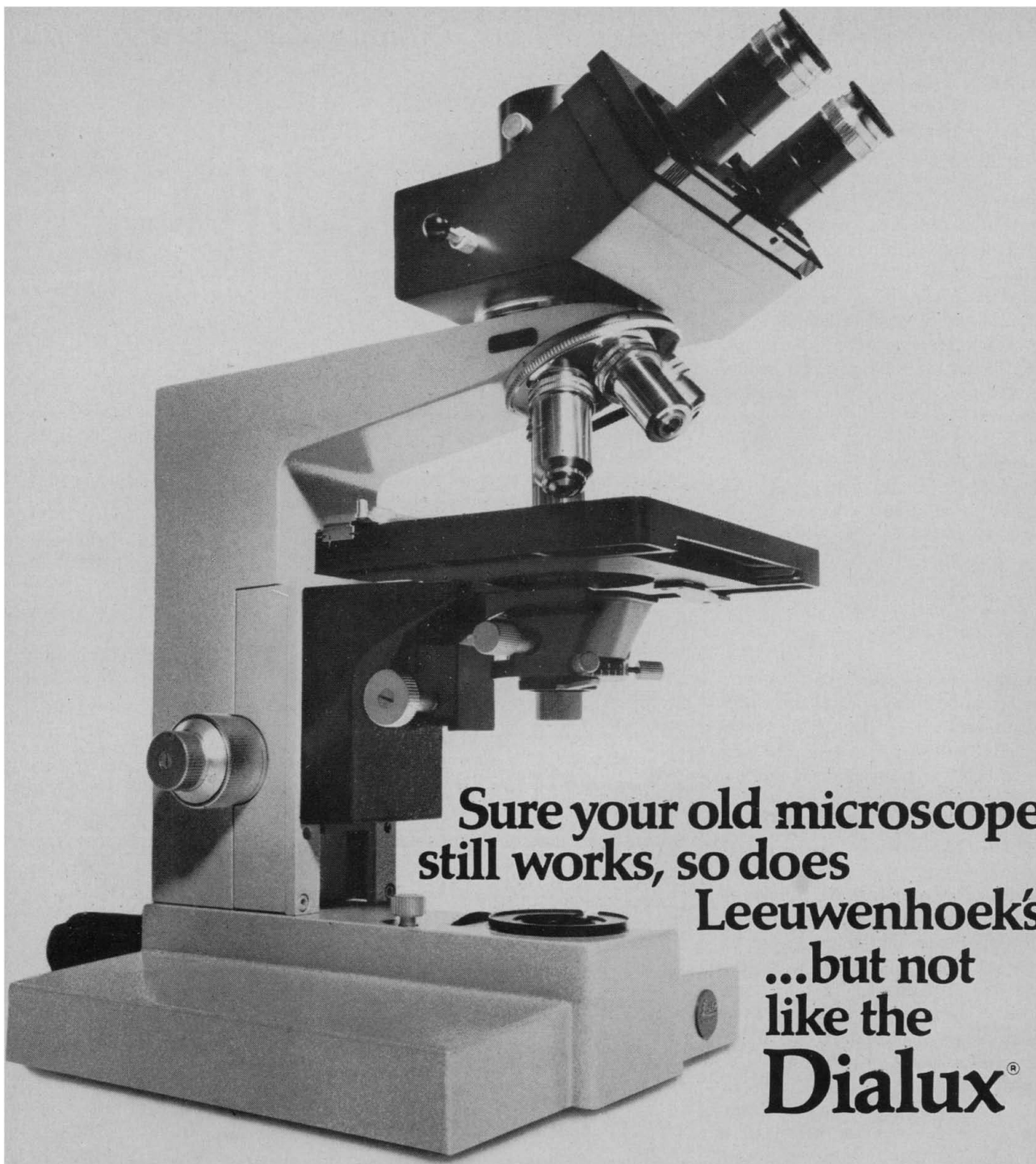
Name/Title _____

Company _____

Address _____

City/State/Zip _____

Circle No. 70 on Readers' Service Card



How many pieces of your laboratory equipment are as outdated as your microscope?

You've probably changed refrigerators, centrifuges, microtomes, colorimeters, but your tired old microscope still goes laboring along.

It's time you looked at the Dialux. The "today" design of this microscope is only the beginning. Enjoy the advantages of truly wide-field observation, high-intensity illumination, crisp, sharp, flat-field objectives. Mechanical performance that feels more

like silk than metal. Interchangeable components that permit either brightfield, darkfield, phase contrast, fluorescence and polarized light microscopy.

Think of how nice your "old" microscope will look on your library shelf and what an improvement the Dialux will make on your laboratory bench.

Drop us a line and we will send you a most convincing brochure on the remarkable new Dialux.

Leitz®
Leica®

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

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

1971

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

1972

ALFRED BROWN	FRANK PRESS
JAMES F. CROW	FRANK W. PUTNAM
THOMAS KUHN	WALTER O. ROBERTS
ELLIOTT W. MONTROLL	

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 and Comment: JOHN WALSH, ROBERT J. BAZELL*, DEBORAH SHAPLEY, ROBERT GILLETTE, NICHOLAS WADE, CONSTANCE HOLDEN, SCHERRAINE MACK

Research Topics: ALLEN L. HAMMOND

Book Reviews: SYLVIA EBERHART, KATHERINE LIVINGSTON, KATHRYN MOUTON

Cover Editor: GRAYCE FINGER

Editorial Assistants: MARGARET ALLEN, ISABELLA BOULDIN, BLAIR BURNS, ELEANORE BUTZ, RONNA CLINE, MARY DORFMAN, JUDITH GIVELBER, MARLENE GLASER, CORRINE HARRIS, OLIVER HEATWOLE, CHRISTINE KARLIK, MARSHALL KATHAN, MARGARET LLOYD, JANE MINOR, DANIEL RABOVSKY, PATRICIA ROWE, LEAH RYAN, LOIS SCHMITT, RICHARD SOMMER, YA LI SWIGART, ALICE THEILE

Membership Recruitment: LEONARD WRAY; Subscriptions: BETTE SEEMUND; Addressing: THOMAS BAZAN

* New York Office (News only): P.O. Box 267, Brooklyn, N.Y. 11217. Telephone: 212-596-1409

Advertising Staff

Director

EARL J. SCHERAGO

Production Manager

BONNIE SEMEL

Advertising Sales Manager: RICHARD L. CHARLES

Sales: New York, N.Y. 10036: Herbert L. Burkland, 11 W. 42 St. (212-PE-6-1858); SCOTCH PLAINS, N.J. 07076: C. Richard Callis, 12 Unami Lane (201-889-4873); MEDFIELD, MASS. 02052: Richard M. Ezequelle, 4 Rolling Lane (617-444-1439); CHICAGO, ILL. 60611: John P. Cahill, 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. 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 Topics: 467-4455; Reviewing: 467-4440. Cable: Advancesci, Washington. Copies of "Instructions for Contributors" can be obtained from the editorial office. See also page xv, *Science*, 24 September 1971. ADVERTISING CORRESPONDENCE: Room 1740, 11 W. 42 St., New York, N.Y. 10036. Phone: 212-PE-6-1858.

New Initiatives in Technology

Recently, Richard M. Nixon has been evincing a considerable interest in winning the 1972 election. He has also been indicating that his tactics for doing so will be daring and imaginative. His proposed visit to China and his actions last August on economic matters were surprising departures from the way a conservative Republican is supposed to act.

For some months Nixon has been seeking to delineate substantial, politically useful initiatives in the field of technology. For this effort he has been utilizing the assistance of many elements of his staff and of the Executive Branch and of numerous outside consultants. No single, large-scale goal has been identified. Rather, the program will consist of a composite of objectives.

Historically the federal government has concentrated its major expenditures for research and development in a few areas. In fiscal 1961, some 91 percent of such expenditures were devoted to atomic energy, space, and defense. In fiscal 1972, despite the various cutbacks that have occurred since 1961, the corresponding figure will be 77 percent. Most citizens would agree that in view of our many domestic needs this proportion is out of line.

To a few citizens, the use of more technology will be abhorrent. However, most people would view favorably the prospect of engaging presently unemployed resources of men and organizations in meeting social needs.

Consideration of means of focusing more attention on the civilian sector is not new. During the Kennedy Administration, Jerome Wiesner often talked of this, but little came of his efforts. Two major factors then and now make the matter politically difficult. First, one cannot identify a single goal that has the kind of dramatic appeal that the moon venture had in the circumstances in which it was announced. Announcement of a lesser single goal would be certain to draw partisan sniping and could prove to be a political liability. Second and more important is the fact that many of the possible initiatives represent a further invasion by the federal government of matters that have previously been considered the domain of private enterprise.

The areas currently under discussion for new initiatives include transportation, urban and suburban affairs, health, natural resources, communications, productivity, the environment, and protection from natural disasters. The final choice of initiatives and the form that new efforts will take will be based on a dual evaluation of technical and political feasibility. The President's science adviser, Edward David, will have considerable say in the determination of technical feasibility. A recent appointee, William A. Magruder, will be influential in political aspects and in ensuring that various bureaus and departments of the federal government loyally implement their share of any new ventures. In an election year, political considerations are likely to have major importance. Already some scientists have expressed fears that the President's science adviser and the Office of Science and Technology will be eclipsed in the new effort. However, David is a resourceful and energetic man, and he has many backers. Moreover, the scope of the new initiatives is so broad that there will be more than enough decisions to keep both David and Magruder very busy in their respective tasks during the next 12 months.

Cynics can and will discount the new initiatives as merely an election-year ploy. However, win or lose, there will remain after the election a residue in the form of a further penetration of government into the management of the nation's life. There could also remain a residue of real progress, for goals once enunciated tend to carry with them a momentum of their own.—PHILIP H. ABELSON

1. Our 6AH Amino Acid Analyzer comes in a table top model. Their 121 is more like a table sized design.

2. Select from 8 buffers with our 6AH. Select from 4 with the 121.

3. The 6AH sensitivity is rated at 5 nanomoles/2 mm and 1 nanomole/6 mm. The 121 rates 4 nanomoles/6 mm and 2 nanomoles/12 mm. Hmmmmm.

4. But wait. The 6AH has a dual plunger buffer pump design. The 121 is equipped with a single plunger.

5. Both the 6AH and 121 have automatic temperature controls. This makes us both even.

6. The 6AH features a standard dual beam detector. The 121 has a single beam detector. We shine again.

7. Our 6AH accommodates 12 samples at a time or 36 with accessories. Theirs holds 72. But do you need 72? Ever?

8. There are 2 water baths in the 6AH design. There's 1 in the 121.

9. Both the 6AH and 121 will take on over-lapping runs.

10. The 6AH has a built-in stream splitting device. This is an option on the 121.

11. The 6AH consumes 2/3 less ninhydrin reagent than the 121.

12. The 6AH is teamed up with a JEOL integrator. The 121 is matched with an Infotronics model. The service is no match at all.

13. Standard hydrolyzate analysis: 6/4 hours on both instruments. Accelerated hydrolyzate: 12/2 hours on both. Physiological fluids: 2.6/9 hours on the 6AH and 2/11 hours on the 121. Close, but look at the \$ and sense of it all.

14. Our 6AH has 2 buffer pumps. Their 121 has 2, as well. Obviously it's a draw.

15. The 6AH.....\$17,900.
The 121.....\$29,980.
Enough said.

This impartial analysis* was brought to you by the people with more information on the 6AH Amino Acid Analyzer. The Automated Analyzer Division, JEOL, 235 Birchwood Ave., Cranford, N.J. 07016. Tel. (201) 272-8820.

JEOL

*Based on current catalog information exclusive of digital integrator.
Amino Acid Analyzers/NMR Spectrometers/Mass Spectrometers/ESR Spectrometers/Laser Raman Spectrophotometers/Laboratory Computers/Scanning Electron Microscopes/Electron Microscopes/X-ray Diffractometers.

Circle No. 9 on Readers' Service Card

NOW! 35% Discount on CRC's Automated Labwashers

SAVE! Buy direct from
the manufacturer.

(offer ends Dec. 31, 1971)



**The new CRC Labwasher®
offers improved glassware
washing plus plasticware cycle.**

Our new line of labwashers will end your labware washing problems. Their fully automatic washing cycles produce spotlessly clean and dry labware, including plasticware, quickly and efficiently.

They cut glass labware breakage in half, and soon pay for themselves in man-hours saved.

- Choice of undercounter, free-standing or mobile models
- Choice of tap or distilled water rinses (up to 3)
- Dual-Temp Forced-Air Drying
- Booster heater for elevating and maintaining water temperatures
- Convenient front loading with roll-out racks
- 16 stainless steel accessory racks handle glass labware or plasticware

For more information,
request Bulletin No. A-111



18901 Cranwood Parkway
Cleveland, Ohio 44128

Circle No. 78 on Readers' Service Card

BOOKS RECEIVED

(Continued from page 939)

citly Scientific Approach. Patty Jo Watson, Steven A. LeBlanc, and Charles L. Redman. Columbia University Press, New York, 1971. xxii, 192 pp., illus. \$6.

The Fight for Quiet. Theodore Berland. Prentice-Hall, Englewood Cliffs, N.J., 1971. xvi, 306 pp. Paper, \$2.95. Reprint of the 1970 edition.

Flavins and Flavoproteins. A symposium, Durham, N.C., 1970. Henry Kamin, Ed. University Park Press, Baltimore, Md.; Butterworths, London, 1971. xviii, 712 pp., illus. \$29.50. International Union of Biochemistry symposium No. 39.

Freud and the Americans. The Beginnings of Psychoanalysis in the United States, 1876-1917. Nathan G. Hale, Jr. Oxford University Press, New York, 1971. xvi, 574 pp. \$15. Freud in America, vol. 1.

From Watt to Clausius. The Rise of Thermodynamics in the Early Industrial Age. D. S. L. Cardwell. Cornell University Press, Ithaca, N.Y., 1971. xvi, 336 pp., illus. \$11.50.

Functional Groups in Organic Compounds. Walter S. Trahanovsky. Prentice-Hall, Englewood Cliffs, N.J., 1971. x, 150 pp., illus. Cloth, \$8.95; paper, \$4.95. Foundations of Modern Organic Chemistry Series.

Génétique Médicale. Maurice Lamy. Masson, Paris, 1971. vi, 264 pp., illus. Paper, 68 F.

Group Theory and Its Applications. Vol. 2. Ernest M. Loebl, Ed. Academic Press, New York, 1971. xiv, 312 pp., illus. \$18.50.

Helping People. Karen Horney's Psychoanalytic Approach. Harold Kelman. Science House, New York, 1971. ix, 622 pp., illus. \$18.50.

Hoofed Mammals of the World. Ugo Mochi and T. Donald Carter. Scribner, New York, ed. 2, 1971. xx, 268 pp., illus. \$9.95.

How to Use the Magic Self-Cybernetics. Ben B. Smith. Fell, New York, 1971. 238 pp., illus. \$7.95.

Human Cytogenetics. Clinical Cytogenetics. Vol. 2. John L. Hamerton. Academic Press, New York, 1971. xviii, 546 pp., illus. \$27.

Immunological Methods in Endocrinology. A symposium, Ulm, Germany, February 1970. K. Federlin, C. N. Hales, J. Kracht, Eds. Thieme, Stuttgart; Academic Press, New York, 1971. viii, 120 pp., illus. \$9. Hormone and Metabolic Research, Supplement Series, No. 3.

In the Name of Life. Essays in Honor of Erich Fromm. Bernard Landis, Edward S. Tauber, and Erica Landis, Eds. Holt, Rinehart and Winston, New York, 1971. xvi, 334 pp., illus. \$10.95.

Introduction to Axiomatic Set Theory. G. Takeuti and W. M. Zaring. Springer-Verlag, New York, 1971. viii, 252 pp. Paper, \$9.50. Graduate Texts in Mathematics, vol. 1.

Introduction to Materials Science. A. G. Guy with the collaboration of M. E. Bever, L. L. Hench, and A. Peterlin. McGraw-Hill, New York, 1971. xx, 604 pp., illus. \$16.50. McGraw-Hill Series in Materials Science and Engineering.

An Introduction to the Study of Man. J. Z. Young. Clarendon (Oxford University Press), New York, 1971. xxvi, 720 pp., illus. \$19.25.

The Insect Societies. Edward O. Wilson. Belknap (Harvard University Press), Cambridge, Mass., 1971. xii, 548 pp., illus. \$20.

Introduction to Newton's 'Principia.' I. Bernard Cohen. Harvard University Press, Cambridge, Mass., 1971. xxx, 380 pp. + plates. \$30.

Kirk-Othmer Encyclopedia of Chemical Technology. Supplement Volume, Adamantane to Units. Anthony Standen, Herman F. Mark, John J. McKetta, Jr., and Donald F. Othmer, Eds. Interscience (Wiley), New York, ed. 2, 1971. xvi, 1008 pp., illus. \$50.

Mach's Philosophy of Science. J. Bradley. Athlone, London, 1971 (U.S. distributor, Oxford University Press, New York). xii, 226 pp., illus. \$13.

Mathematical Foundations for Design: Civil Engineering Systems. Robert M. Stark and Robert L. Nicholls. McGraw-Hill, New York, 1971. x, 566 pp., illus. \$16.50.

Mathematical Logic and Formalized Theories. A Survey of Basic Concepts and Results. Robert Rogers. North-Holland, Amsterdam; Elsevier, New York, 1971. xii, 236 pp. Cloth, \$17.25; paper, \$8.95.

Mechanics. Keith R. Symon. Addison-Wesley, Reading, Mass., ed. 3, 1971. xiv, 640 pp., illus. \$13.75. Addison-Wesley Series in Physics.

Medicine and Ethnology. Selected Essays. Erwin H. Ackerknecht. H. H. Walser and H. M. Koelbing, Eds. Johns Hopkins Press, Baltimore, Md., 1971. 196 pp., \$10.

Methods of Biochemical Analysis. Vol. 20. David Glick, Ed. Interscience (Wiley), New York, 1971. x, 396 pp., illus. \$17.50.

Mineral Optics. Principles and Techniques. Wm. Revell Phillips. Freeman, San Francisco, 1971. xii, 250 pp. + plates. \$12.50. A Series of Books in Geology.

Modern Cosmology. D. W. Sciama. Cambridge University Press, New York, 1971. viii, 212 pp., illus. \$8.95.

The New York Times 1972 Guide to College Selection. Ella Mazel. Quadrangle, Chicago, 1971. xviii, 240 pp., illus. Paper, \$4.95.

Newer Methods of Preparative Organic Chemistry. Vol. 6. W. Forest, Ed. Verlag Chemie, Weinheim, Germany; Academic Press, New York, 1971. xii, 316 pp., illus. \$19.50.

Nonbenzenoid Aromatics. Vol. 2. James P. Snyder, Ed. Academic Press, New York, 1971. xii, 436 pp., illus. \$22. Organic Chemistry, Vol. 16-2.

On the Volterra and Other Nonlinear Models of Interacting Populations. N. S. Goel, S. C. Maitra, and E. W. Montroll. Academic Press, New York, 1971. viii, 146 pp., illus. \$5.50. Reviews of Modern Physics Monographs.

The Origin and Diversification of Language. Morris Swadesh. Joel Sherzer, Ed. Aldine-Atherton, Chicago, 1971. xviii, 350 pp. \$9.75.

Palaeozoic Fishes. J. A. Moy-Thomas. Second edition, revised by R. S. Miles. Saunders, Philadelphia, 1971. xii, 260 pp., illus. \$12.75.

The Polytron[®] homogenizer.

If it can be done, we can probably do it.

The Willems Polytron[®] homogenizer is unlike

any mixer you've ever used. It works on a unique principle—kinetic plus ultrasonic energy. And it often succeeds where other instruments fail.

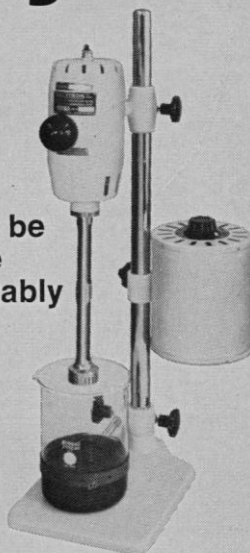
Homogenization by sound waves means that tissues are broken down quickly to sub-cellular level without destruction of enzyme activity. You'd be hard-pressed to do that with other kinds of mixers.

In the applications field, the Polytron has proved so effective in inducing physical and chemical change that it has already revolutionized many procedures. Whether it be for dispersing, homogenizing, emulsifying or disrupting, a Polytron is available in the size to meet your specific requirements.

Contact us if you have any questions. Both literature and a demonstration are available on request.



Brinkmann Instruments, Inc.
Cantiague Road,
Westbury, L. I., N.Y. 11590
Brinkmann Instruments
(Canada), Ltd.
50 Galaxy Boulevard,
Rexdale (Toronto), Ontario.



Photochemistry. R. B. Cundall and A. Gilbert. Appleton-Century-Crofts, New York, 1971. x, 220 pp., illus., \$10.95. Studies in Modern Chemistry.

Planned Urban Environments. Sweden, Finland, Israel, The Netherlands, France. Ann Louise Strong. Johns Hopkins Press, Baltimore, Md., 1971. xxxiv, 406 pp., illus. \$20.

Problems of Psychoanalytic Training, Diagnosis, and the Technique of Therapy, 1966-1970. Anna Freud. International Universities Press, New York, 1971. xii, 312 pp. \$12.50. The Writings of Anna Freud, vol. 7.

Progress in High Temperature Physics and Chemistry. Vol. 4. Carl A. Rouse, Ed. Pergamon, New York, 1971. viii, 200 pp., illus. \$19.50.

Prospects in Mathematics. A symposium, Princeton, N.J., March 1970. F. Hirzbruch, Lars Hörmander, John Milnor, Jean-Pierre Serre, and I. M. Singer. Princeton University Press, Princeton, N.J., University of Tokyo Press, Tokyo, 1971. viii, 186 pp. Paper, \$6. Annals of Mathematics Studies, No. 70.

Psychological Solutions to Social Problems. An Introduction to Social Technology. Jacobo A. Varela. Academic Press, New York, 1971. xvi, 318 pp. \$12.50. Social Psychology.

The Radiation Chemistry of Water. Ivan G. Draganić and Zorica D. Draganić. Academic Press, New York, 1971. xii, 244 pp., illus. \$14. Physical Chemistry, vol. 26.

Ralph Linton. Adelin Linton and Charles Wagley. Columbia University Press, New York, 1971. x, 196 pp., illus. Cloth, \$7.50; paper, \$2.95. Leaders of Modern Anthropology Series.

Suburban Land Conversion in the United States. An Economic and Government Process. Marion Clawson. Published for Resources for the Future by Johns Hopkins Press, Baltimore, Md., 1971. xviii, 406 pp., illus. \$12.50.

Theory of Seismic Head Waves. Vlastislav Červený and Ravi Ravindra. University of Toronto Press, Buffalo, N.Y., 1971. xvi, 312 pp., illus. \$18.50.

Traité de Zoologie. Anatomie, Systématique, Biologie. Published under the direction of Pierre-P. Grassé. Tome 16, Mammifères. Fascicule 3, Musculature des Membres, Musculature Peaucière, Musculature des Monotrèmes, Arthrologie. F.-K. Jouffroy, J. Lessertisseur, R. Saban, and J. D. Souteyrand-Boulenger. Masson, Paris, 1971. viii, 1210 pp., illus. 390 F.

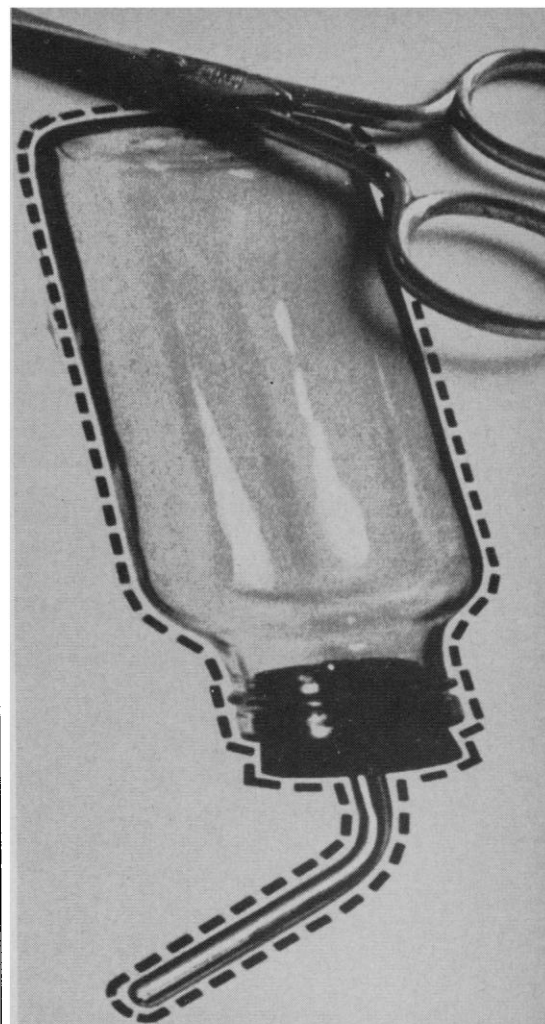
Transistor Audio Amplifiers. P. Tharma. Van Nostrand Reinhold, New York, 1971. 414 pp., illus. \$19.50.

Underwater Physiology. A symposium. C. J. Lambertsen, Ed. Academic Press, New York, 1971. xxiv, 576 pp., illus. \$23.

University Urban Research Centers. Grace M. Taher, Ed. Urban Institute, Washington, D.C., ed. 2, 1971. xxii, 300 pp. Paper, \$2.75.

The Weather Workbook. Fred W. Decker. Weather Workbook Co., Corvallis, Ore., ed. 3, 1971. 91 pp., illus. Unbound, \$2.75. Weather Map Study. 25 pp., illus. Unbound, 60¢.

White Attitudes toward Black People. Angus Campbell. Institute for Social Research, Ann Arbor, Mich., 1971. viii, 178 pp., illus. Cloth, \$8; paper, \$5.



Cut out 30% of animal care costs

Our story is straightforward.

Automatic animal watering systems work—they're cutting out bottles all across the country. And they save money—easily 30% of total animal care labor in most facilities. Our appeal is equally straightforward. If most animal facilities can save that kind of money—yours should find out more.

Hence, the coupon.

Please send us the facts about how automatic watering works, how it saves money . . . catalog, specifications, user list.

name _____

firm _____

address _____

city _____ state _____ zip _____

Hardco Automatic Watering

Hardco Scientific Div., Fieldstone Corp.
3229 Omni Drive
Cincinnati, Ohio 45245

Circle No. 76 on Readers' Service Card

Circle No. 72 on Readers' Service Card