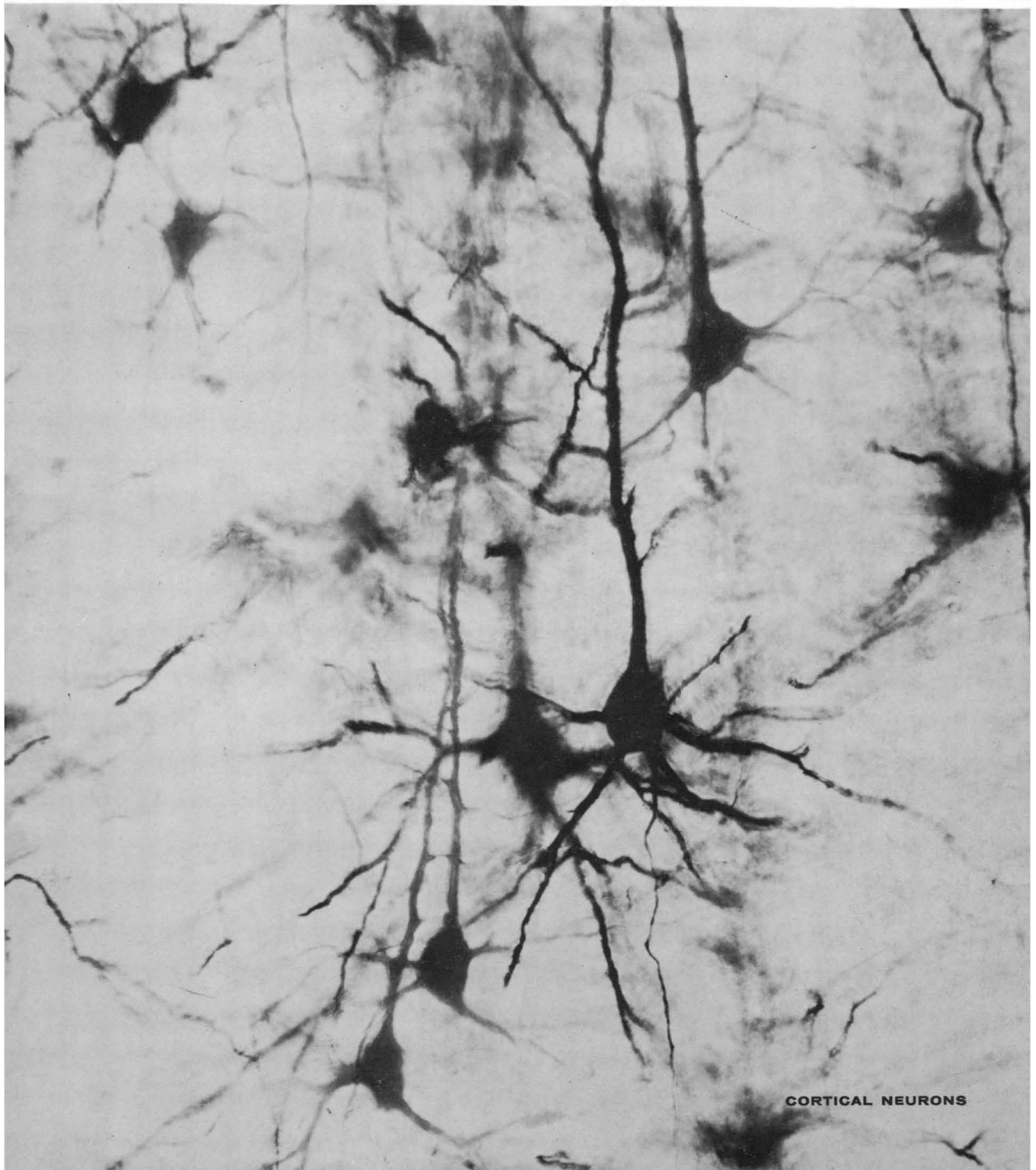


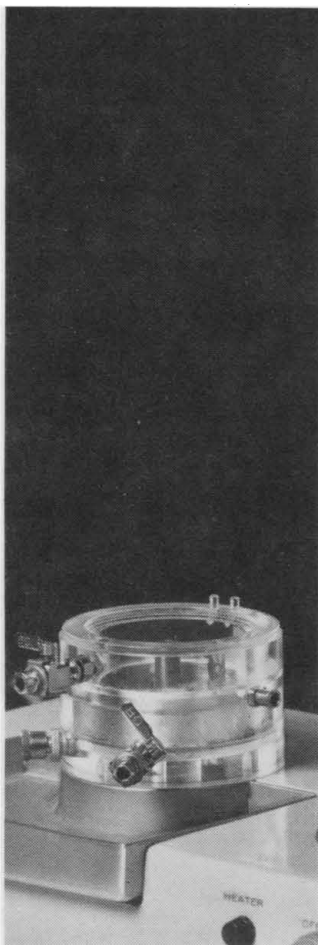
SCIENCE

3 April 1964
Vol. 144, No. 3614

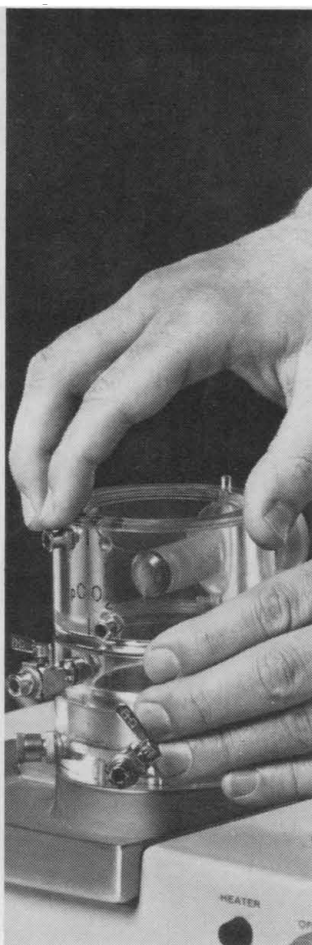
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



CORTICAL NEURONS



*To a constant temperature
water bath*



... add a pCO₂ module



... a pO₂ module



... then a pH module

HOW'S THAT FOR VERSATILITY IN A BLOOD GAS CUVETTE!

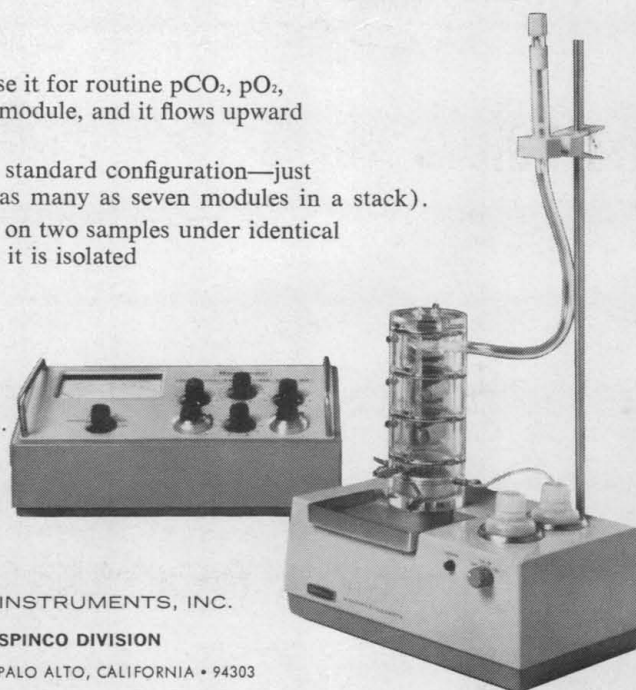
Above you see our new Modular Cuvette just as you would use it for routine pCO₂, pO₂, and pH measurements. Now inject a sample into the bottom module, and it flows upward to be measured simultaneously in all three modules.

But research needs vary, and there's no need to stay with the standard configuration—just rearrange modules, or add as many as you wish (we've had as many as seven modules in a stack).

Perhaps for a particular study you want to compare readings on two samples under identical conditions. Simple again—give any module a slight turn and it is isolated from the others for individual sampling.

Happily, the performance of our Modular Cuvette is as impressive as its versatility. Precise temperature control to $\pm 0.1^\circ\text{C}$ is maintained by constant temperature water circulating through the centers of all modules. Sample size is small—less than a third of a cc fills all three standard modules.

The remarkable Modular Cuvette and its companion 160 Physiological Gas Analyzer are described in our new brochure on blood gas analysis; ask for Data File MC-5.



Beckman®

INSTRUMENTS, INC.

SPINCO DIVISION

PALO ALTO, CALIFORNIA • 94303

International Subsidiaries: Geneva, Switzerland; Munich, Germany; Glenrothes, Scotland; Paris, France; Tokyo, Japan; Capetown, South Africa.

See the Modular Cuvette in the Beckman booth at the Federation Meetings in Chicago.

Patton—Introductory Insect Physiology

Here is an effective textbook geared to the needs of the modern day course in insect physiology. It is designed to meet the needs of the student who is well-grounded in the various disciplines of biology, and of the student with a strong background in the physical sciences.

Dr. Patton's book is concise yet thorough . . . covering all generally accepted ideas on life mechanisms of insects, while holding dissenting opinions to a minimum. Physiologic phenomena common to most insects are stressed, and extraneous material and exotic mechanisms that might tend to sidetrack the student are avoided. Discussions range from Functions of the Parts of the Digestive System to Structure and Microstructure of Insect Nervous Systems. *The chapter headings and paragraph titles can readily form the basis for a lecture outline. This organization gives the instructor the opportunity to fill in new details of knowledge as they appear, and furnishes the*

student with a prepared outline for review study.

The approach is biochemical. Energy production and its related intricacies are correlated to show the complex interrelations of the vital systems. Basing his selection of material on his experience of 24 years as a teacher, the author explains most fully those principles and hypotheses he has found to be most difficult for students.

The student will find a solid core of basic facts which offer a foundation for further work and future investigation. Newly acquired information is included on such subjects as: Nutrition—Transport—Neuro-muscular phenomena—Sensory response—Pheromones—Circadian rhythms—Study of mode of action of biologically active chemicals. *Order your copy today!*

By ROBERT L. PATTON, Ph.D., Professor of Insect Physiology, Cornell University. 245 pages, 6 1/4" x 9 1/4", illustrated. \$5.50. Published September, 1963.

Christensen—pH and Dissociation

This unique programed text is designed to help students of the biological sciences acquire a firm understanding of the association and dissociation of the hydrogen ion in aqueous solutions. The *vertical linear* format is comprised of small sequential steps, followed by a question based on each new fact. The student is required to *write the correct* answer to each question before he is permitted to proceed to the next frame. This insures adequate feedback and reinforcement. After about 7 hours of study the reader can expect to reach a level where he can calculate the pH of buffer systems, select indicators and

buffers for various applications, interpret the titration curves of multifunctional compounds, predict the electrophoretic behavior and interactions of protein molecules, and understand the buffering by biological systems and the sensitivity of biological events to pH. The author presumes only a minimal acquaintance with pH, logarithms, indicators, titrations, stoichiometry and structural chemistry.

By HALVOR N. CHRISTENSEN, Ph.D., Professor of Biological Chemistry and Chairman of the Department, the University of Michigan. 60 pages, 7 1/4" x 10 1/4", illustrated. \$1.75. Published July, 1963.

Third Edition Routh—20th Century Chemistry

Students taking a single course in chemistry, elective or required, must have a text thorough enough to acquaint them with the fundamentals of inorganic, organic and biological chemistry—yet simple enough in presentation to create and maintain interest. Dr. Routh has designed his text to meet this problem. He has written it solely for the one-year introductory course in the fundamentals of chemistry. So skillfully has he covered the subject that the text is fully understandable and inviting even for students who have

never had a course in chemistry. Dr. Routh stresses the principles underlying all chemical knowledge and the application of these to specific uses in everyday life. This *Third Edition* contains a new chapter on nucleic acids and nucleoproteins, plus new material on glucagon, thyroid hormones, parathyroid hormones, steroid hormones.

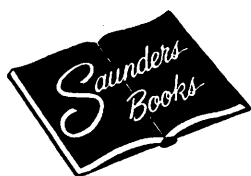
By JOSEPH I. ROUTH, Ph.D., Professor of Biochemistry, State University of Iowa. 489 pages, 6 3/4" x 9 3/4", with 284 illustrations. \$8.00. *Third Edition—Published June, 1963.*

Gladly sent to teachers on approval

W. B. SAUNDERS COMPANY

West Washington Square • Phila. 5, Pa.

SC 4-3-64



Please send me: ☐ Check enclosed (Send postpaid) ☐ Bill me
☐ Patton—Insect Physiology.....\$5.50 ☐ Christensen—pH & Dissociation....\$1.75
☐ Routh—20th Century Chemistry...\$8.00

Name.....
Address..... Position.....

3 April 1964

Vol. 144, No. 3614

SCIENCE

LETTERS	Metric System in Disguise: <i>W. M. Shepperd</i> ; Mutations and Aging: <i>P. R. J. Burch</i> ; NASA's Role Explained: <i>R. B. Painter</i> ; Biology Departments Should Buy Natural Preserves: <i>L. F. Yntema</i>	
EDITORIAL	Federal Executive Salaries	15
ARTICLES	Dislocation Movements in Metals: <i>D. Kuhlmann-Wilsdorf</i> and <i>H. G. F. Wilsdorf</i>	17
	Defects in atomic structure of crystalline solids determine their plastic properties.	
	Molecular Theories of Memory: <i>W. Dingman</i> and <i>M. B. Sporn</i>	26
	Any theory of memory in the nervous system must consider structure and function in the entire neuron.	
	Scientific Advice for Congress: <i>C. P. Anderson</i>	29
	A veteran legislator suggests that current proposals are overlooking some realities of legislative life.	
NEWS AND COMMENT	Scientific Gloom—Congress Hasn't Been That Bad; Education in California—The Master Plan; Pesticides—Fish Slaughters	32
BOOK REVIEWS	Barzun: The Glorious Entertainer: <i>G. G. Simpson</i>	38
	The Germination of Seeds, reviewed by <i>J. Popenoe</i> ; other reviews by <i>D. E. Hathaway</i> , <i>S. H. Williams</i> , <i>J. F. Marchand</i> , <i>T. L. Wade</i> , <i>W. J. van Wagtenonk</i> , <i>M. H. Trytten</i> , <i>C. A. Buss</i>	39
REPORTS	Visual Pigments in Single Rods and Cones of the Human Retina: <i>P. K. Brown</i> and <i>G. Wald</i>	45
	Urea: Apparent Carrier-Mediated Transport by Facilitated Diffusion in Dogfish Erythrocytes: <i>H. V. Murdaugh</i> , <i>E. D. Robin</i> , <i>C. D. Hearn</i>	52
	Strontium and Calcium Reabsorption in Renal Tubules of the Newt, <i>Triturus pyrrhogaster</i> : <i>R. Ichikawa</i> , <i>Y. Enomoto</i> , <i>F. Sakai</i>	53
	Ethanol Accumulation in the Rumen after Overfeeding with Readily Fermentable Carbohydrate: <i>J. J. Allison</i> et al.	54

BOARD OF DIRECTORS	ALAN T. WATERMAN Retiring President, Chairman	LAURENCE M. GOLD, President	HENRY EYRING, President-Elect	JOHN W. GARDNER H. BENILEY GLASS	DAVID H. GOODEN DON R. PRICE
VICE PRESIDENTS AND SECTION SECRETARIES	MATHEMATICS (A) R. W. Hamming Wallace Givens	PHYSICS (B) Ralph A. Sawyer Stanley S. Ballard	CHEMISTRY (C) Roland Rivest S. I. Melsel	ASTRONOMY (D) Walter Orr Roberts Frank Bradshaw Wood	
	ANTHROPOLOGY (H) Anthony F. C. Wallace Eleanor Leacock	PSYCHOLOGY (I) Lorin A. Riggs Frank W. Finger	SOCIAL AND ECONOMIC SCIENCES (K) Harold D. Lasswell Ithiel de Sola Pool	HISTORY AND PHILOSOPHY OF SCIENCE (J) John Murdoch N. Russell Hanson	
	PHARMACEUTICAL SCIENCES (Np) Lee H. MacDonald Joseph P. Buckley	AGRICULTURE (O) Edward F. Knipping Howard B. Sprague	INDUSTRIAL SCIENCE (P) Allen T. Bonnell	EDUCATION (Q) Herbert S. Conrad Frederic B. Dutton	
DIVISIONS	ALASKA DIVISION Charles J. Eagan President George Dahlgren Executive Secretary		PACIFIC DIVISION Phil E. Church President Robert C. Miller Secretary		SOUTHWESTERN AND ROCKY MOUNTAIN DIVISION Edwin R. Helwig President Marlowe G. Anderson Executive Secretary
SCIENCE is published weekly 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 © 1964 by the American Association for the Advancement of Science. Annual subscription \$8.50; foreign postage, \$1.50; Canadian postage, 75¢; single copies, 35¢. School year subscriptions: 9 months, \$7; 10 months, \$7.50. Provide 4 weeks' notice for change of address, giving new and old address and zip numbers. Send a recent address label. SCIENCE is indexed in the Reader's Guide to Periodical Literature.					

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

Parathion Activation by Livers of Aquatic and Terrestrial Vertebrates: <i>J. L. Potter and R. D. O'Brien</i>	55
Insect Chemosterilants with Low Toxicity for Mammals: <i>S. C. Chang, P. H. Terry, A. B. Bořkovec</i>	57
Humoral Factor from the Brain Which Activates Gastric Motility: <i>N. C. Jefferson et al.</i>	58
Decontamination of Potato Tubers Containing Cesium-137: <i>H. J. Perkins and G. Strachan</i>	59
Pteropod Ooze from Bermuda Pedestal: <i>C. Chen</i>	60
Excretion of Hypertonic Urine by a Teleost: <i>J. G. Stanley and W. R. Fleming</i>	63
Freezing and Viability of <i>Tetrahymena pyriformis</i> in Dimethylsulfoxide: <i>S. Hwang, E. E. Davis, M. T. Alexander</i>	64
Chromosome Number and Morphology of a Human Preinvasive Neoplasm: <i>R. M. Richart and P. A. Corfman</i>	65
Alpha-Ketoglutaric Semialdehyde: A Metabolic Intermediate: <i>R. M. M. Singh and E. Adams</i>	67
Spectra of Deoxygenated Hemoglobin in the Soret Region: <i>R. Benesch, R. E. Benesch, G. Macduff</i>	68
Allotropy in Some Rare-Earth Metals at High Pressures: <i>G. J. Piermarini and C. E. Weir</i>	69
Ferric Tourmaline from Mexico: <i>B. Mason, G. Donnay, L. A. Hardié</i>	71
Ferrosilite (FeSiO ₃): Synthesis at High Pressures and Temperatures: <i>D. H. Lindsley, B. T. C. Davis, I. D. MacGregor</i>	73
Group Learning of Speech Sequences without Awareness: <i>D. Shapiro</i>	74
Time Factors in Interhemispheric Transfer of Learning: <i>O. S. Ray and G. Emley</i>	76
Wavelength Generalization after Discrimination Learning with and without Errors: <i>H. S. Terrace</i>	78
<i>Comments on Reports—I.Q., Genetics, and Culture: E. E. Daniel, L. Erlenmeyer- Kimling, L. F. Jarvik; Temperature of Metallic Objects in Space: R. H. Wilson, Jr., C. P. Butler, R. J. Jenkins</i>	80
MEETINGS Arachnid Behavior: <i>C. J. Goodnight</i> ; Initiation of Labor: <i>C. A. Villee</i> ; Prenatal Irradiation: Effects on the Development of the Central Nervous System and Postnatal Behavior: <i>J. Werboff</i> ; Forthcoming Events	82

LINA REES WALTER ORR ROBERTS	ATHELSTAN F. SPILHAUS H. BURR STEINBACH	PAUL E. KLOPSTED Treasurer	DAEL WOLFE Executive Officer
ECOLOGY AND GEOGRAPHY (E) Trevor Lloyd Richard H. Mahard	ZOOLOGICAL SCIENCES (F) Arthur D. Hasler David W. Bishop	BOTANICAL SCIENCES (G) Harriet B. Creighton Warren H. Wagner	
ENGINEERING (M) Charles F. Savage Leroy K. Wheelock	MEDICAL SCIENCES (N) James Ebert Oscar Touster	DENTISTRY (Nd) James A. English S. J. Kreshover	
INFORMATION AND COMMUNICATION (T) Wallace R. Brode Phyllis V. Perkins	STATISTICS (U) Morris B. Ullman		

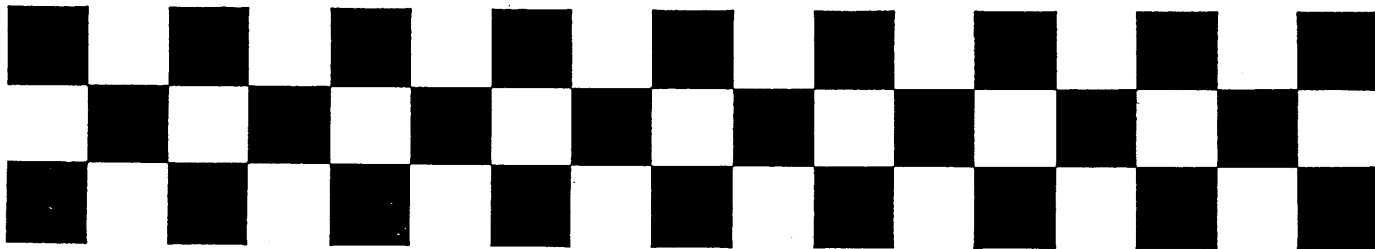
The American Association for the Advancement of Science was founded in 1848 and incorporated in 1874. Its objects are to further the work of scientists, to facilitate cooperation among them, to improve the effectiveness of science in the promotion of human welfare, and to increase public understanding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

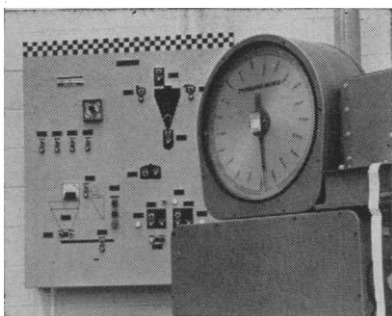
COVER

Photomicrograph of pyramidal neurons, stained by the Golgi method, from parietal cerebral cortex of the albino rat. Approximately 1 percent of the total neurons present were stained (about $\times 785$). See page 26. [Stanley Jacobson, National Institutes of Health]



Pur-Pak Chows are packed in polyethylene bags by a man in a sterilized suit operating in a sealed, sterile room.

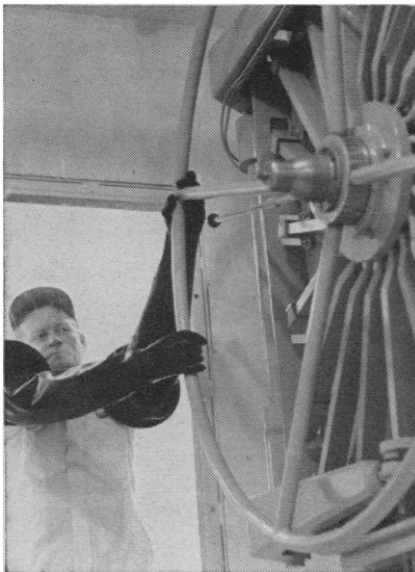




First step is to set up formula on control board. Exact proportioning of ingredients assures uniform, high nutrition.

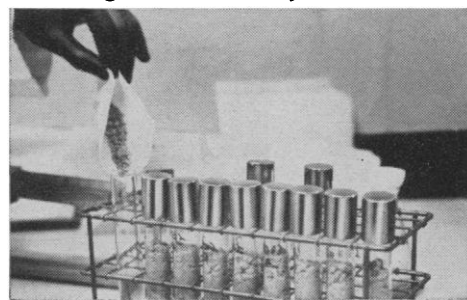
NOW...
a new measure
of quality control
in laboratory
animal feeding...

Polyethylene inner bags are autoclaved before entering sterile packing room.



Sterilized poly inner bags are filled, then double heat sealed. Poly bags later are packed into paper.

Samples are taken continuously and sent in sterile bags to the laboratory for certification.



Purina® Pur-Pak Chows™

Now, for the first time, research workers and animal breeders can get animal diets pressure-processed to eliminate most microorganisms.

The Ralston Purina Company has built at Davenport, Iowa, a mill with new equipment to make Purina PUR-PAK laboratory diets. They are pressure-processed and sealed in sterile bags. All nutritive qualities are preserved. Texture is improved. *There are two kinds:*

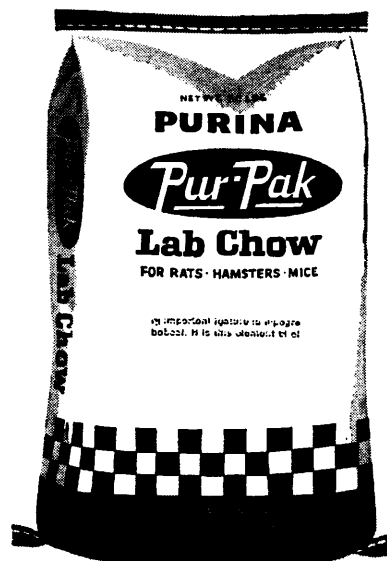
- **PURINA PUR-PAK LAB CHOW** for rats, hamsters, mice
- **PURINA PUR-PAK MOUSE BREEDER CHOW** for mouse breeder colonies

Each will be offered with two types of microorganism control:

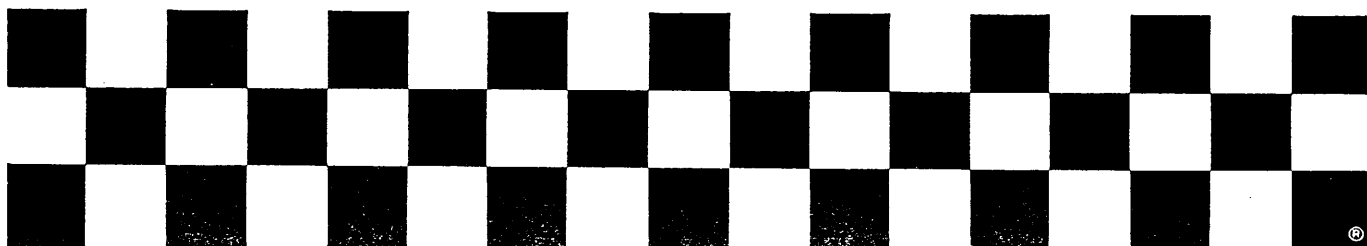
REGULAR—processed under sufficient pressure and temperature to insure that the product, as packaged, has a reduced level of microorganisms.

CERTIFIED—laboratory tested to assure that the diet is free, as packed, of *Bacillus anthracis* and all other bacteria except gram-positive, aerobic, spore-forming *Bacillus* species with not more than 1000 of these organisms per gram.

Your Purina Dealer or Salesman has samples, prices and more information about these new products. Call him or write to Mr. H. A. Graff, Ralston Purina Company, St. Louis, Mo., for folder and sample.



PURINA...world's leading manufacturer of laboratory animal diets



One of a series briefly describing GM's research in depth

SQUARE LOOP FERRITES NOW IN ODDBALL SHAPES

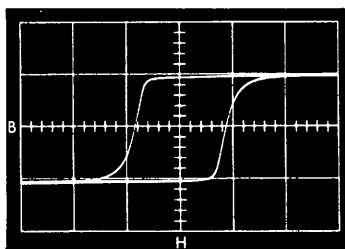
Ceramic ferrites are versatile magnetic oxides usually made by the press forming of powdered ingredients. Here at the Laboratories, a recent spill-over from our fundamental research in ferrites has resulted in a new fabrication technique. It makes ferrites of virtually any type or shape practicable: permanent magnetic ferrites, high frequency core materials, computer elements with square hysteresis loops.

The new "cookie cutter" process begins with ferrite powder mixed with a plastic binder on a rubber mill. This forms a flexible sheet of almost any thickness down to 0.005 inch. From it, ferrites of any desired shape can be cut or molded—easily and economically—before the special presintering and sintering treatments. The fired ferrites shrink evenly and are exceptionally uniform in material density and magnetic characteristics.

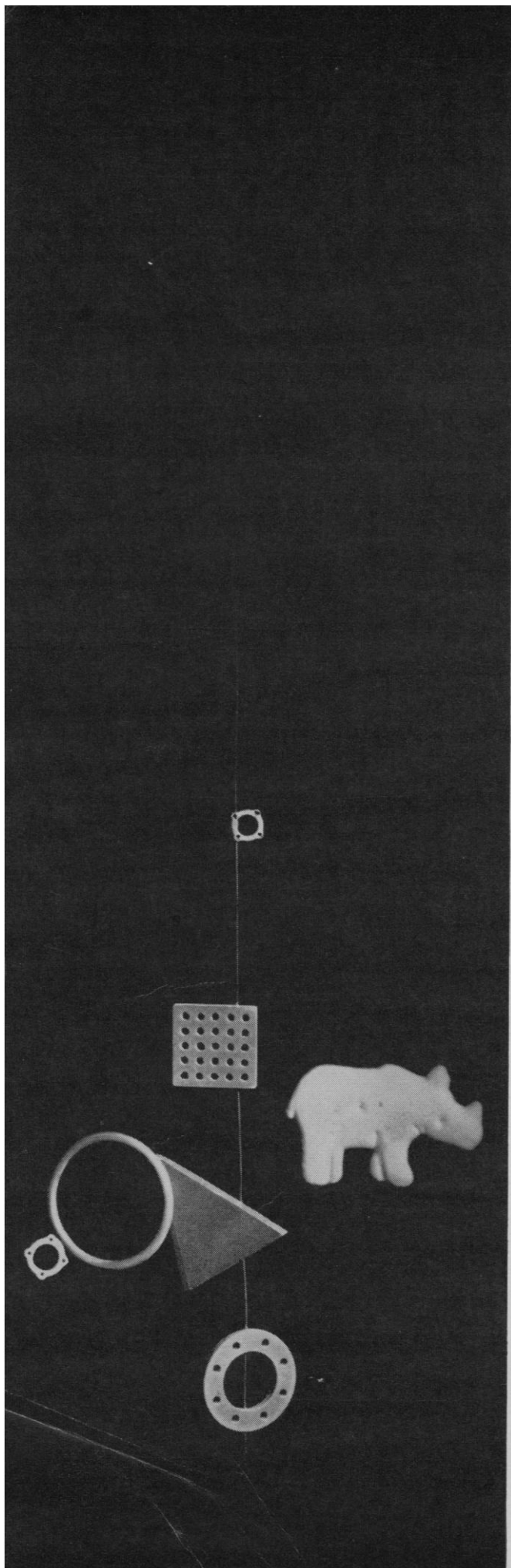
Our electronics engineers have found the new fabrication technique particularly valuable for making multiaperture devices—wafer-thin square loop ferrites used in computer memory cores and switching circuits. Practical development of these and other applications is continuing as a team effort of the Laboratories and GM divisions.

Involving a blend of scientific understanding and engineering know-how, this new process is another example of the advances in technology being made by GM's research in depth.

General Motors Research Laboratories
Warren, Michigan



Hysteresis loop from ferrite memory core prepared by new GMR process.



Do you wish you could **DO ALL THESE ANALYSES ON ONE INSTRUMENT?**

(a) IN CLINICAL CHEMISTRY

- acid and alkaline phosphatase
- albumen/globulin
- arsenic
- calcium
- chloride and other halides
- glucose and glucose oxidase
- inorganic phosphates
- iron
- magnesium

- nicotinic acid

- phosphorus
- potassium
- salicylic acid
- total protein
- transaminase
- urea nitrogen
- uric acid and urease

(b) IN ANALYTICAL CHEMISTRY

- aminophenols
- arsenic and antimony

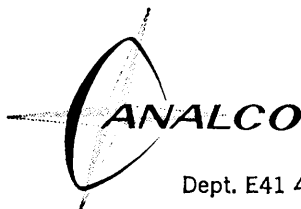
- calcium

- halides
- hydroquinone
- magnesium
- mercaptans
- nitrogen
- phosphates
- sulphur-containing compounds, such as sulfides, thiosulfates, thiourea, mercaptans
- transition metals
- unsaturation

• in micro-volumes (some as small as 1 ul) • faster, and with far greater accuracy and sensitivity than the methods now commonly in use • without the use of standards?

Coulachron

now makes this possible. Come take a look at this remarkable new analyzer at Booth 373 at the Federation Exhibit (Continental Room, Conrad Hilton) or write for further details to:



Dept. E41 4935 Cordell Ave. Bethesda, Maryland 20014



Talk about torque!

This stirrer blade is applying 9 inch pounds of torque—almost *double* the torque of conventional stirrers!

That's more than enough to move it through even the most viscous materials such as pastes, paints, syrups and many petroleum derivatives.

You've never seen anything like it, because it's one of our new TRANSI-STIR stirrers.

This new line features a solid state, transistorized control that puts power back in the motor to insure uniform torque on *demand*. Slow,

relentless drive in heavy materials . . . high speeds for the lighter.

Once set, control is continuous and automatic. The TRANSI-STIR senses the right thing to do at the right time. Never any slowdown, overload or heat build-up, even under highest resistance for sustained periods.

The TRANSI-STIR is one compact unit. No separate control boxes, rheostats or vacuum tubes.

And with the Kontes K-79055 three shafted model you get considerable overlap in all speed ranges: low from 20 to 175 rpm's; medium

between 120 and 1000 rpm's; and high from 800 to 6000 rpm's.

Notice the overlap? No gap anywhere!

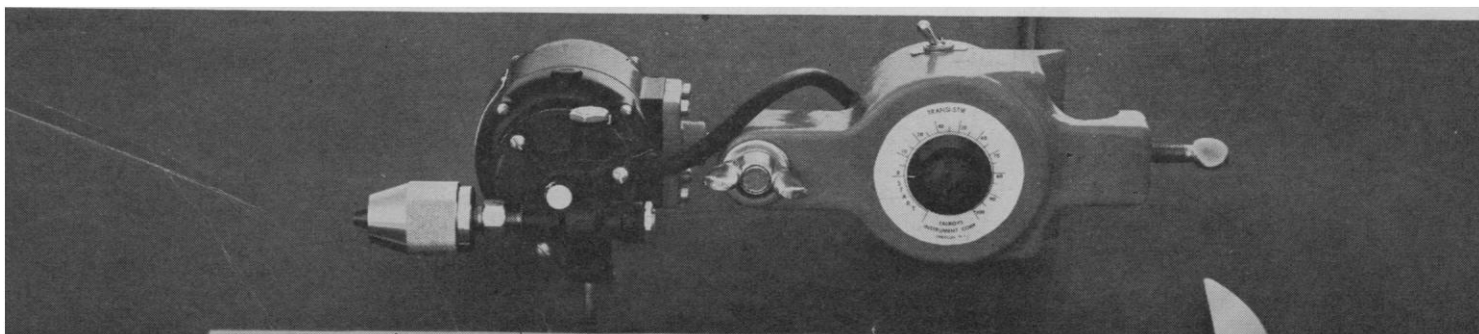
Every need's covered—from homogenizing to bath agitation.

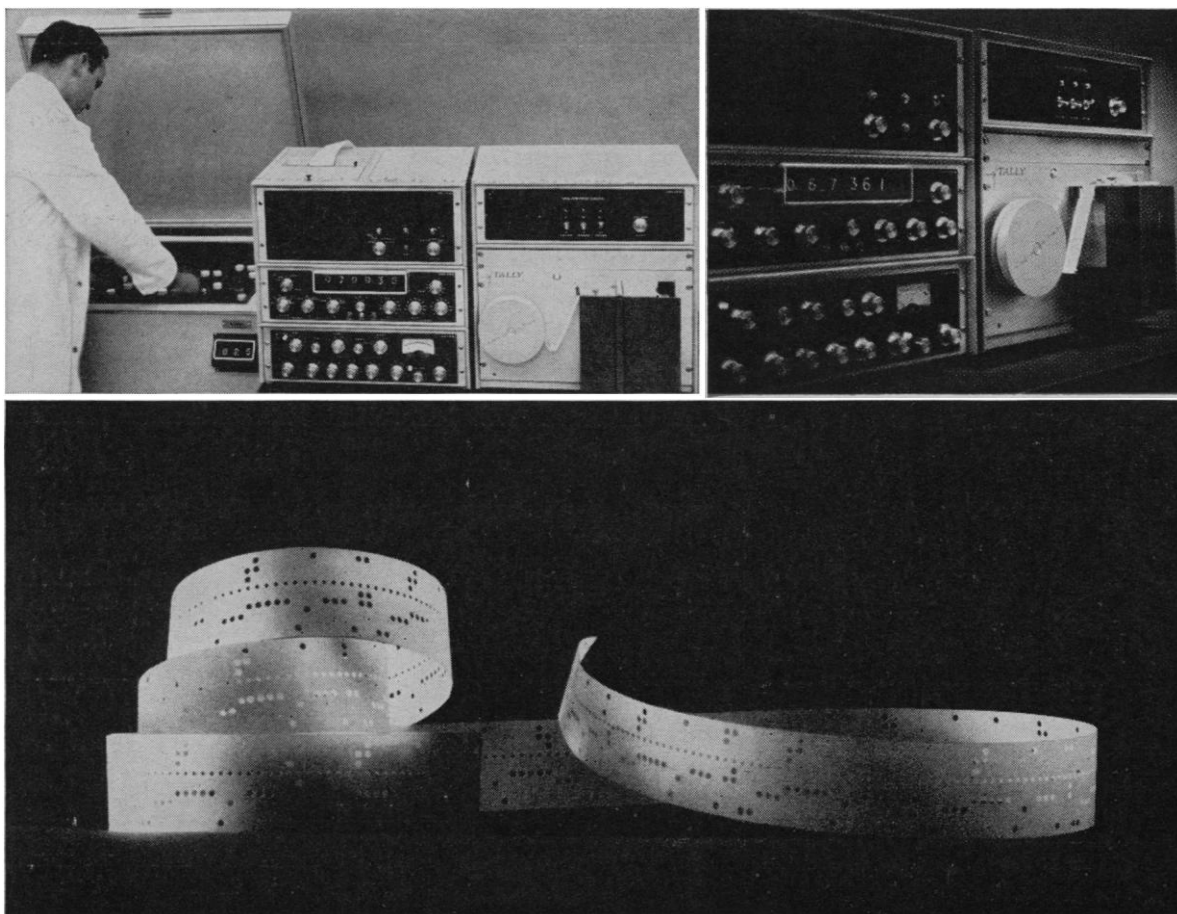
Write on your company letterhead today for our four page Bulletin #164 which gives complete details (we'll also send you our 300 page General Catalog describing our 11,000 quality glassware items).

KONTES
GLASS COMPANY
Vineland, New Jersey



Exclusive Distributors: **KONTES OF ILLINOIS**, Franklin Park, Illinois • **KONTES OF CALIFORNIA**, Berkeley, California





NOW YOU CAN CONVERT CPM TO DPM AUTOMATICALLY

The investigator using a large-capacity liquid scintillation spectrometer seeks to determine the relative counting efficiencies of his many samples. One way to approach this goal has been to employ automatically calculated counts per minute and channels ratio data to measure the effects of sample quenching.

Although this technique represents great savings in counting and calculation time when contrasted with other methods such as internal

standardization, it still requires the manual derivation of efficiency curves.

This problem yields, of course, to computer analysis. And now, Nuclear-Chicago has helped make such analysis a practical reality for liquid scintillation spectrometry.

Our Data Converter module transfers all digital sample data to computer punch tape, punch cards, or standard electric typewriter forms. And of even greater significance, we offer the necessary software to accompany the instrument. We have now prepared a computer program for the analysis of carbon-14 data using the channels ratio technique, and in due course we will announce the availability of programs for other isotopes.

Now, weeks of calculation carried out manually may be performed in a few minutes by a digital computer. With flexible programming, an investigator may feed his data into a computer and let it obtain the results he desires. He is free to concentrate his time and abilities on designing and performing experiments and on interpreting results.

For more information on our Data Converter and computer analysis for liquid scintillation spectrometry, consult your Nuclear-Chicago sales engineer or write directly to us.

NUC-B-3-268



NUCLEAR-CHICAGO

A DIVISION OF NUCLEAR-CHICAGO CORPORATION

349 Howard, Des Plaines, Illinois 60018

PRO PLVRIBVS VNVM

VNQVE

VNQVE

VNQVE

VNQVE

GILSON RESPIROMETER

ONE reference flask **FOR MANY** active flasks in differential respirometry. No glassware calibration necessary. Digital readout directly in microliters, 0-500. Gilson Medical Electronics, Middleton, Wis.

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

DAVID M. BONNER	WILLARD F. LIBBY
MELVIN CALVIN	NEAL E. MILLER
ERNEST COURANT	PHILIP M. MORSE
FARRINGTON DANIELS	COLIN S. PITTENDRIGH
JOHN T. EDSALL	KENNETH S. PITZER
DAVID R. GODDARD	DEWITT STETTEN, JR.
ALEXANDER HOLLAENDER	WILLIAM L. STRAUS, JR.
ROBERT JASTROW	EDWARD L. TATUM
EDWIN M. LERNER II	JOHN R. WINCKLER
CLARENCE M. ZENER	

Editorial Staff

Editor

PHILIP H. ABELSON

<i>Publisher</i>	<i>Business Manager</i>
DAEL WOLFLE	HANS NUSSBAUM

Managing Editor: ROBERT V. ORMES

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

Assistant to the Editor: NANCY TEIMOURIAN

News and Comment: DANIEL S. GREENBERG, JOHN WALSH, ELINOR LANGER, MARION ZEIGER, ROSEMARY GALLI

Book Reviews: SARAH S. DEES

Editorial Assistants: ISABELLA BOULDIN, ELEANORE BUTZ, SYLVIA EBERHART, GRAYCE FINGER, NANCY HAMILTON, OLIVER HEATWOLE, ANNE HOLDSWORTH, MARCIA ISAAK, RUTH KINGERLEE, HOWARD NATHENSON, EDGAR RICH

Advertising Staff

<i>Director</i>	<i>Production Manager</i>
EARL J. SCHERAGO	RAYMONDE SALAMA

Sales: New York, N.Y., 11 W. 42 St. (212-PE-6-1858): RICHARD L. CHARLES, ROBERT S. BUGBEE
Scotch Plains, N.J., 12 Unami Lane (201-889-4873): C. RICHARD CALLIS

Chicago Ill., 6 W. Ontario St. (312-DE-7-4973): HERBERT BURKLAND

Los Angeles 45, Calif., 8255 Beverly Blvd. (213-643-9817): WINN NANCE

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. ADVERTISING CORRESPONDENCE: Rm. 1740, 11 W. 42 St., New York, N.Y. 10036. Phone: 212-PE 6-1858.

Federal Executive Salaries

Salaries for the upper levels of federal service are too low; Pennsylvania pays 165 and New York pays 432 state employees more than Uncle Sam pays the Secretary of State. Moreover, there is too little range at the top; the doorkeeper of the House of Representatives is paid almost as much as a congressman. The Senate passed and the House recently defeated a comprehensive bill that would have revised the whole federal salary structure, including the salaries of congressmen. Preliminary balloting showed a large measure of House support, but on the final roll call a majority of the members did not want to go on record as having voted to increase their own salaries.

Congress is always loath to raise the salaries of others above their own, but the increases are badly needed, as the President and most congressmen are well aware. Some major positions are unfilled, and the government has been losing too many top scientists, executives, and professional men, for it is at the upper levels that government salaries are most out of line. Men who reach these levels must choose between leaving for higher salaries elsewhere or remaining at greater personal sacrifice than should be asked of them.

Despite the earlier setback, a strong effort is being made to get the same or a similar bill through Congress, perhaps without the congressional increases and perhaps with other increases a little smaller than those of the defeated bill. Most government scientists are in the classified Civil Service, where the ceiling—which only a few can reach—is now \$20,000 a year. The new bill will raise the ceiling to perhaps \$24,500. Above the Civil Service grades are some 400 major executive positions which will be grouped into six levels. Level I will include the ten cabinet posts; Level II, nine subcabinet positions; and Level III, 42 deputy and assistant secretaries and the heads of the independent agencies. The remainder of these executive posts will be assigned by the President to Levels IV to VI. The six levels will carry salaries from perhaps \$26,500 up to \$32,500 or \$35,000. Neither in the upper Civil Service grades nor at the executive levels are the proposed salaries comparable to those available elsewhere, but the changes are in the right direction and it would be a mistake not to make them.

On the plus side, this new effort to increase federal salaries has strong Presidential endorsement, and the necessary money is already in the budget. On the negative side, legislative channels are likely to get clogged, and interested congressmen complain that they have received but little encouragement from educators, scientists, and business leaders—the people who can best understand how greatly the proposed changes would help in the recruitment and retention of able people who are needed to give leadership to the whole executive structure.

The defeated bill had a curious omission in its failure to list the director of the National Science Foundation among the comparable positions to be placed in Level III. This omission would have resulted in the thoroughly unjustified downgrading of the entire National Science Foundation. Fortunately, it seems now to be agreed between Congressman Morrison of Louisiana, chairman of the cognizant committee of the House, and the Bureau of the Budget that this fault will be corrected before the bill goes to a vote. Both in correcting this boner and in pressing for early passage of the entire bill, Congressman Morrison should have all the help he can get.

—DAEL WOLFLE

PACKARD offers two types of gamma counting systems:

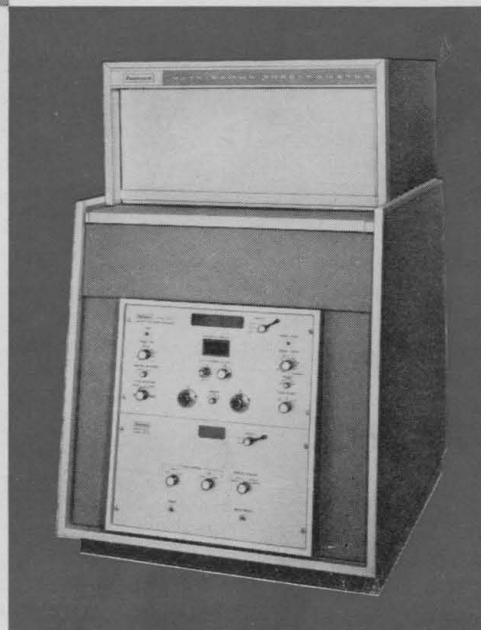


this one needs people
(MANUAL)

this one doesn't
(AUTOMATIC)

Here are two of twelve different Packard gamma counting systems designed for the medical, biological, or chemical research laboratory. Each system incorporates the remarkable new 3000 Series Spectrometer which is noted for its stable performance, accuracy, and repeatability of results. The modestly priced single channel manual system which consists of the spectrometer and a well-type detector with either 2" or 3" crystal, is ideally suited for laboratories with modest gamma counting requirements. For users with maximum requirements, Packard offers a selection of six fully automatic, 100 sample capacity models which incorporate single, dual, or three channel spectrometers, patented constant background sample change mechanism, and printer or calculator.

Your Packard Sales Engineer can provide complete details on these incomparable gamma counting systems, or, write for Bulletin 1025.



Packard

PACKARD INSTRUMENT COMPANY, INC.

BOX 428 • LA GRANGE, ILLINOIS • AREA CODE 312 • 485-6330

SCIENTISTS !



**WHETHER YOU SPIN IT
AND COOL IT
CUT IT
FRACTIONATE IT
HOMOGENIZE IT
or PIPETTE IT**

(and are concerned with quality, accuracy, economy and trouble-free operation)

ON THE FOLLOWING PAGES MAY BE THE ANSWER TO YOUR INSTRUMENTATION NEEDS

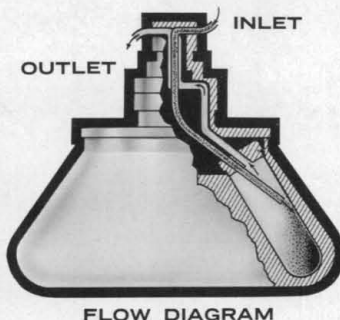
SORVALL

SERVING THE WORLD'S CENTRIFUGES AND



†**RC-2 AUTOMATIC SUPERSPEED REFRIGERATED CENTRIFUGE**—17,500 rpm—37,000 x G—Capacity to 1,890 ml. Five Angle and Horizontal Rotors available. Shown set up for unique SORVALL Continuous Flow centrifugation.

"Szent-Gyorgyi & Blum" KSB TUBE-TYPE CONTINUOUS FLOW SYSTEMS**
(as shown on RC-2)—Available for SS-1, SS-1A, SS-3, SS-4, RC-1 & RC-2. Separation achieved in 8, 4, or 2 Tubes speedily and conveniently.



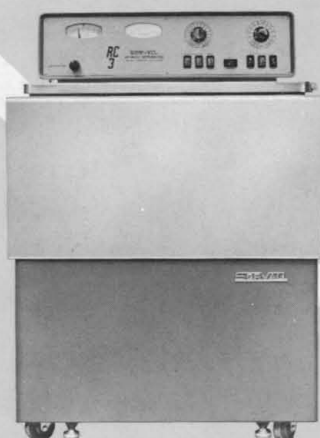
SS-3 with KSB-3



†**SS-3 AUTOMATIC SUPERSPEED CENTRIFUGE**—17,000 rpm—34,800 x G. Easily the most advanced table-top centrifuge available today. Designed for the busy laboratory.



SS-4 MANUAL SUPERSPEED CENTRIFUGE—17,000 rpm—34,800 x G. The modern manually-controlled centrifuge. Complete control panel snaps out for remote control.



BR-4 Two-Liter General-Purpose Rotor (with stainless steel cups & screw covers)



BR-4T Blood Bag Rotor (with Teflon coated cups)

(BOTH BR-4 ROTORS for use only with RC-3.)

†**RC-3 GENERAL PURPOSE AUTOMATIC REFRIGERATED CENTRIFUGE**—For blood-bank programming, clinical and routine applications. BR-4T Rotor accepts four 500 ml blood bags. Eight other rotors available. Swingout large-capacity rotor under development. 5,000 rpm—5,140 x G. Exceptionally fast centrifugation cycle. 60 seconds maximum to top speed with BR-4T Rotor.



SS-1 SUPERSPEED ANGLE CENTRIFUGE—16,000 rpm—31,000 x G. The original concept in Superspeed Angle Centrifuges. Also, the SS-1A, same as above but water-cooled for extra-heavy duty, prolonged runs.

Ivan Sorvall, Inc.
NORWALK • CONNECTICUT • 06852



LEADING LABORATORY INSTRUMENTS

ROTORS FOR SS-3, SS-4, RC-2, RC-3



SS-34 — 8 x 50ml Superspeed. Adapts to Continuous Flow. To 17,500 rpm—37,000 x G



SU — SORVALL-Sharp for virus, particle counting. 8 cells, 20,000 rpm—31,500 x G (not recommended for RC-3)



SM-24 — 24 x 15ml Superspeed. 16,000 rpm — 31,550 x G



GSA — Large-Capacity. 1,890ml (operating). 6 Compartments. 10,000 rpm—16,300 x G



HB-4 — Swinging Bucket 4 x 50ml—Wide range of tubes and adapters. Also for density gradient work. Up to 10,000 rpm — 16,300 x G

**Patented



Type SP



Type XL



Type SP/X



Type M

(Types M & SP/X Rotors also for use with RC-3)

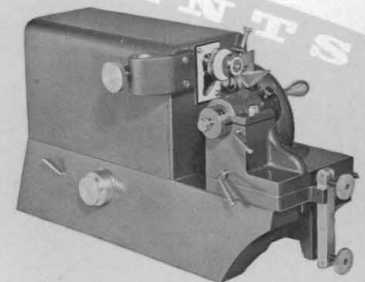
Type A



ONE BASIC MOTOR ASSEMBLY can be used for any one of five different rotors in this range of Small and Medium Centrifuges. Exceptional versatility in the number and types of tubes and adapters accommodated permits hundreds of combinations.

MT-1 "Porter-Blum" ULTRA-MICROTOME**

1/40 to 1/2 Micron. Ensures highest possible accuracy in obtaining ultra-thin sections from both hard and soft biological tissue, synthetic fibers, soft metals, rubber, etc., for light and electron microscopy. Various stereomicroscopes available. Basic Microtome equipped with Glass Knife Holder and Glass Knives. The ideal instrument for teaching ultra-microtomy.



MT-2 "Porter-Blum" ULTRA-MICROTOME**

The latest word in ultra-microtomy. Cutting range from 100A to 4 μ — dial controlled • Stepless cutting speed adjustment from .09 to 3.2 mm/sec. • Orientation scales provide "memory" feature — save duplication of effort • Stage Assembly, Knife Edge, Specimen Holder all pivot on optimum sectioning point • Universal Knife Stage Assembly • "Porter-Blum" Mechanical Advance • Alternate thin and thick sectioning • Precision specimen trimming with instrument itself • Automatic power drive or manual drive • Unique rear-mounted Pivoting Stereo-microscope Arm • Built-in Cold Light Source with Special Diffuser • Unitized construction — no auxiliary sub units • No special installation required. The new MT-2 is the most versatile, accurate, compact, yet simple to use ultra-microtome offered anywhere.



AND FOR THE MICROTOMIST: "Thin Sectioning & Associated Technics" including Supplement "A". An 80-page illustrated book plus Supplement, published by Ivan Sorvall, Inc. Price: \$2.00 each.

HANDY REPLY AND INQUIRY CARD. JUST CHECK INSTRUMENTS IN WHICH YOU HAVE SPECIAL INTEREST, AND MAIL



Ivan Sorvall, Inc. NORWALK • CONNECTICUT

GENTLEMEN: I am interested in: ☐ Literature ☐ Your Quotation ☐ Seeing your representative concerning the Instrument(s) checked:

- | | |
|---|---|
| <input type="checkbox"/> SS-1 Superspeed Centrifuge | <input type="checkbox"/> RF-1 Ribi Refrigerated Cell Fractionator |
| <input type="checkbox"/> SS-1A Superspeed Centrifuge | <input type="checkbox"/> RF-1 Abstracts (8 page folder) |
| <input type="checkbox"/> SS-3 Automatic Superspeed Centrifuge | <input type="checkbox"/> MT-1 "Porter-Blum" Ultra-Microtome |
| <input type="checkbox"/> SS-4 Manual Superspeed Centrifuge | <input type="checkbox"/> MT-2 "Porter-Blum" Ultra-Microtome |
| <input type="checkbox"/> RC-2 Automatic Superspeed Refrigerated Centrifuge | <input type="checkbox"/> Micro-Macro Omni-Mixer Homogenizer |
| <input type="checkbox"/> RC-3 General-Purpose Automatic Refrigerated Centrifuge | <input type="checkbox"/> Micro Homogenizer Attachment |
| <input type="checkbox"/> KSB Continuous Flow System | <input type="checkbox"/> Automatic Pipettes |
| <input type="checkbox"/> Small & Medium Centrifuges | <input type="checkbox"/> Product Guide & Price List of all Sorvall Instruments |
| <input type="checkbox"/> Rotors for _____ Centrifuge(s) | <input type="checkbox"/> Catalog & Price List of Tubes & Adapters for Sorvall Centrifuges |

"Thin Sectioning & Associated Technics" including Supplement "A" at \$2.00 ea.

Please Bill Me _____

ACCESSORIES FOR:

Name (Dr., Mr., Mrs., Miss) _____
 Dept. _____
 Institution _____
 Street _____
 City _____ State _____ Zip Code _____



Basic Unit with Accessories

OMNI-MIXER HOMOGENIZER For the rapid, high-speed, safe homogenizing of many organic and inorganic materials. Simple to use yet extremely efficient. Direct overhead drive. Stainless steel mixing chambers or ordinary Mason jars are accommodated. For special applications an autoclavable rotor knife assembly with lower Teflon bearing is available. Chambers and jars may be filled and sealed prior to attaching to Omni-Mixer and may be conveniently lowered into a temperature regulating bath if desired. Complete range of capacities from 5ml to two quarts for macro work.

And of special interest to anyone wishing to homogenize and emulsify micro-samples for biological, chemical, clinical, research and industrial applications:

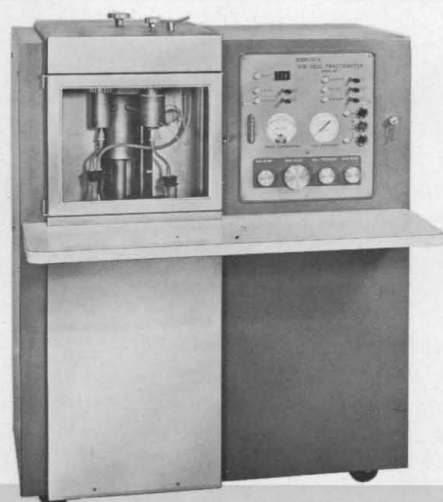
The SORVALL Omni-Mixer Micro-Homogenizer Attachment**

- Sealed stainless steel chamber
- Easy to assemble, clean and autoclave
- Rugged construction throughout
- Designed for high torque throughout speed range
- Choice of optional chambers and accessories



Basic Unit with Micro Attachment

Micro Attachment in Optional Storage Box



RF-1 RIBI REFRIGERATED CELL FRACTIONATOR**

Bacteria, fungi and tissue cells can be disrupted under controlled conditions thereby permitting their walls to be separated from cytoplasm by centrifugation. Cell walls of many microorganisms, from which greatly improved experimental vaccines have been made, may now be obtained in sufficient quantities for large scale experimentation. Fundamental sub-cellular substances such as enzymes, microsomal particles and nucleic acids may be isolated from the cytoplasmic fraction in an unaltered state.

Use reply card to obtain copy of abstracts on cell research and related investigation with the RF-1 Ribi Refrigerated Cell Fractionator.

**Patented



AUTOMATIC PIPETTES

Accurate, time-saving. For routine laboratory work in dispensing aqueous solutions, antigens, etc. Models for 0.1 to 3.0ml and 1.0 to 10.0ml.

HANDY REPLY AND INQUIRY CARD. JUST CHECK INSTRUMENTS IN WHICH YOU HAVE SPECIAL INTEREST, AND MAIL



FIRST CLASS
PERMIT NO. 163
NORWALK, CONN.

BUSINESS REPLY MAIL

NO POSTAGE STAMP NECESSARY IF MAILED IN THE UNITED STATES

POSTAGE WILL BE PAID BY

Ivan Sorvall, Inc.

NORWALK • CONNECTICUT • 06852



PRODUCT GUIDE for
SORVALL Centrifuges and
Laboratory Instruments

PRICE LIST
and **ORDERING**
SPECIFICATIONS

CATALOG of **TUBES**,
ADAPTERS and
ACCESSORIES



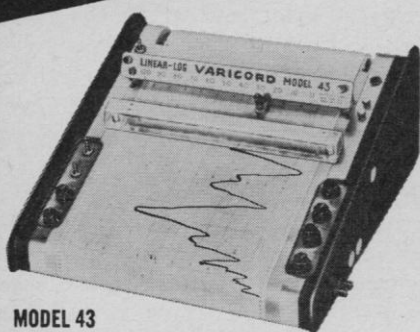
"Thin Sectioning & Associated Technics" including Supplement "A". An 80-page illustrated book plus Supplement, published by Ivan Sorvall, Inc. Price: \$2.00 each.

Refer to Reply Card for Literature.

Ivan Sorvall, Inc.
NORWALK • CONNECTICUT • 06852

Printed in U.S.A.

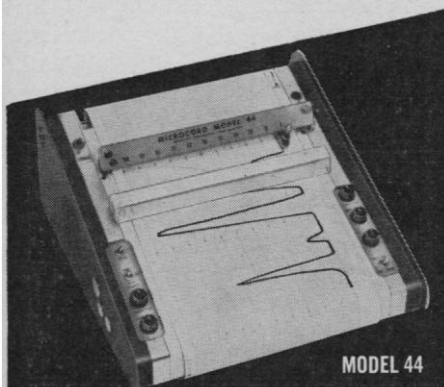
FOR CONVENIENCE AND ACCURACY USE ONE OF THESE 10" MULTI-PURPOSE RECORDERS



MODEL 43

VARICORD LINEAR/LOG LABORATORY RECORDER

24 calibrated ranges from 10 MV or 10 μ A full scale. Potentiometric recording, both linear and logarithmic. Absorbance scale zero to infinity.



MODEL 44

MICROCORD SUPER SENSITIVE LABORATORY RECORDER

$\frac{1}{2}$ MV full scale maximum sensitivity, or 50 microvolts per inch. Fast pen speed; excellent noise rejection. Dual chart speed.

Write for bulletins
Stocked by
Laboratory Supply Houses

PHOTOVOLT
CORPORATION
1115 BROADWAY • NEW YORK 10, N.Y.

prior to birth. Our concern for ourselves, our progeny, and our national welfare forces us to continue and expand this important area of research with particular emphasis placed on the development of systematic and integrative research into the biological and behavioral concomitants of prenatal irradiation.

Other participants in the conference were C. D'Amato (University of Michigan), E. Harvey and P. S. Henshaw (U.S. Atomic Energy Commission), G. Shaber (Jefferson Medical College), M. R. Sikov (Wayne State University), and J. N. Yamazaki (University of California, Los Angeles). This conference was held under the auspices of the American Institute of Biological Sciences, with support from the U.S. Atomic Energy Commission, contract No. AT-(49-7)-1287. The proceedings of the conference were completely transcribed, and after they are edited they will be available to interested scientists who may obtain them by writing to the address shown here.

J. WERBOFF

*Jackson Laboratory, Hamilton Station,
Bar Harbor, Maine*

Forthcoming Events

April

9-11. American Assoc. for **Cancer Research**, annual, Chicago, Ill. (H. J. Crech, AACR, Institute for Cancer Research, Fox Chase, Philadelphia 11, Pa.)

9-11. Association of **Clinical Pathologists**, spring meeting, London, England. (G. Cunningham, Dept. of Pathology, 47 Lincoln's Inn Fields, London, W.C.2)

9-11. **Geological Soc. of America**, southeastern section, Baton Rouge, La. (R. J. Martin, 1426 Harvard Rd., NE, Atlanta, Ga.)

9-11. **Southwestern Psychological Assoc.**, annual, San Antonio, Tex. (C. C. Cleland, 2104 Meadowbrook Dr., Austin, Tex. 78703)

9-13. **Roentgen Congr.**, German, Wiesbaden, Germany. (H. Lossen, Deutscher Röntgenkongress, Fichterplatz 20 III, Mainz, Germany)

10. **Natural Phenolic Compounds**, symp., Tokyo, Japan. (M. Shimokoriyama, Dept. of Botany, Univ. of Tokyo, Hongo, Tokyo)

10-11. American **Laryngological Assoc.**, San Francisco, Calif. (L. G. Richards, 12 Clovelly Rd., Wellesley Hills 82, Mass.)

10-11. Association of **Physicians of Great Britain and Ireland**, annual, Oxford, England. (G. de J. Lee, Dept. of Medicine, Radcliffe Infirmary, Oxford)

11. **Paleontological Research Inst.**, Ithaca, N.Y. (R. S. Harris, 109 Dearborn Place, Ithaca)

11-12. **Histochemical Soc.**, 15th annual, Chicago, Ill. (A. D. Deitch, Dept. of

Microbiology, Columbia Univ., 630 W. 168 St., New York 32)

12. **Industrial Fibers**, European inst., Milan, Italy. (F. Tommy-Martin, 40 rue du Stand, Geneva, Switzerland)

12-13. American Soc. for **Artificial Internal Organs**, Chicago, Ill. (B. K. Kuserow, Dept. of Pathology, Univ. of Vermont College of Medicine, Burlington)

12-17. Federation of American Societies for **Experimental Biology**, Chicago, Ill. (H. B. Lemp, The Federation, 9650 Wisconsin Ave., NW., Washington, D.C.)

12-17. Society of **Motion Picture and Television Engineers**, semiannual technical conf., Los Angeles, Calif. (J. M. Waner, Eastman Kodak Co., 6706 Santa Monica Blvd., Hollywood 38, Calif.)

12-18. Chemistry of **Natural Products**, intern. symp., Kyoto, Japan. (Science Council of Japan, Ueno Park, Tokyo, Japan)

13-15. Institute of **Environmental Sciences**, annual, Philadelphia, Pa. (J. Breen, RCA Bldg., 10-1-2, Camden 2, N.J.)

13-15. **Microelectronics**, 3rd annual symp., St. Louis, Mo. (T. F. Murtha, P.O. Box 4104, St. Louis, Mo. 63136)

13-16. American Acad. of **General Practice**, Atlantic City, N.J. (M. F. Cahal, Volker Blvd. at Brookside, Kansas City 12, Mo.)

13-16. **Industrial Health**, conf., Pittsburgh, Pa. (American Industrial Health Conf., 55 E. Washington St., Chicago, Ill.)

13-16. **Industrial Medical Assoc.** and American Assoc. of **Industrial Nurses**, Pittsburgh, Pa. (C. D. Bridges, 55 E. Washington St., Chicago, Ill. 60602)

13-16. American **Radium Soc.**, White Sulphur Springs, W. Va. (J. J. Stein, U.C.L.A. Medical Center, Los Angeles 24, Calif.)

13-17. **Fluid Power**, intern. conf. and exhibition, London, England. (Secretary of the Conference, The Tower, 229-243 Shepherds Bush Rd., Hammersmith, London, W.6)

14-16. **Power Conf.**, Chicago, Ill. (W. A. Lewis, Illinois Inst. of Technology, Chicago)

14-18. Primary Disorders of **Heart Muscle** (by invitation), CIBA Foundation symp., London, England (CIBA, 41 Portland Pl., London, W.1)

14-18. **Mathematical Logic**, conf., Oberwolfach, Germany. (M. Barner, Mathematisches Forschungs-institut, Hebelstr. 29, 78 Freiburg im Breisgau, Germany)

15-17. **High Energy Physics**, conf., Chilton, England. (Inst. of Physics and the Physical Soc., 47 Belgrave Sq., London S.W.1, England)

15-17. **Ophthalmological Soc.** of the United Kingdom, annual, Dublin, Ireland. (Secretariat, 47 Lincoln's Inn Fields, London, W.C.2, England)

15-18. British **Paediatric Assoc.**, annual, Scarborough, England. (E. W. Hart, Inst. of Child Health, Hospital for Sick Children, Great Ormond St., London, W.C.1)

15-18. American Soc. for **Public Administration**, natl. conf., New York, N.Y. (ASPA, 6042 Kimbark Ave., Chicago, Ill.)

15-18. **International Scientific Radio Union (URSI)**, spring meeting, Washington, D.C. (M. G. Morgan, U.S. Natl. Committee, URSI, Dartmouth College, Hanover, N.H.)

MILESTONES IN ULTRAMICROTOMY the KnifeMaker* by LKB

provides highly-reproducible glass knives with ease and simplicity

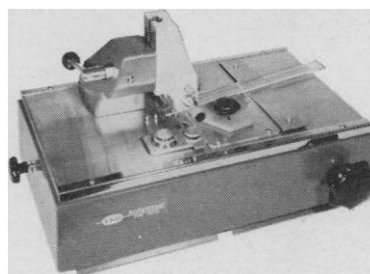
LKB presents the *first precision tool for breaking glass knives for ultramicrotomy*. The entirely new KnifeMaker, 7800A, supplants wasteful hit-and-miss hand methods with controlled, mechanical operation ensuring highly reproducible results. This high yield of good knives is a triple time saver by drastically reducing the percentage of rejects, eliminating time spent testing unknown edges, and most important, by improving the general quality of sections.

Fully acceptable results are obtained with a minimum of practice. The KnifeMaker accurately locates and grips the glass firmly and applies adjustable scoring pressure and breaking forces all within seconds.

Once the most suitable knife angle is decided upon, the unit is ready to break as many knives as you need. *Each will be almost identical to the other.* Reset the angle only when a change in cutting conditions demands it.

Knives can be broken for use with any commercially available ultramicrotome and to meet a whole range of cutting problems.

For complete information, request data file 7800S4



LKB INSTRUMENTS, INC., 4840 Rugby Ave., Washington, D. C. 20014

LKB PRODUKTER AB, P.O. Box 12220, Stockholm 12, Sweden

**pat. pend.*

RESPECTED FOR QUALITY AND SERVICE

The exceptional professional capabilities of the staff, coupled with rigid standards of production and an insistence on quality control, have earned for Flow Laboratories a distinctive reputation for quality. Matched with this is Flow's singular dedication to customer service. Prompt delivery and helpful, *knowledgeable* response to inquiries are the rule rather than the exception. You can turn with confidence to Flow for a complete line of



TISSUE CULTURE

CELLS • SERA AND MEDIA

Serially propagated cells from normal and malignant tissue; primary cultures from human and animal organs; chemically defined media with or without serum; stock concentrates; balanced salt solutions; sera and embryo extracts.

Request complete catalog from



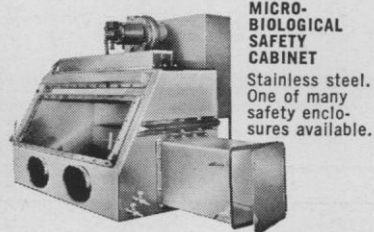
FLOW LABORATORIES INCORPORATED
1710 CHAPMAN AVENUE ROCKVILLE, MARYLAND

VISIT US AT THE FED. MEETING
Booth 448
Palmer House
April 13th—17th, 1964 Chic., Ill.

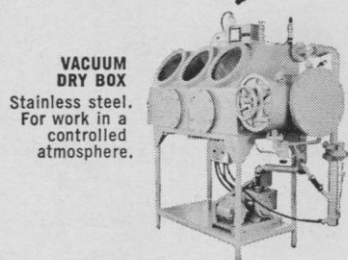
HANDLE HAZARDOUS MATERIALS SAFELY!

- TOXIC CHEMICALS
- RADIOACTIVE MATERIALS
- LIVE VIRUSES, BACTERIA
- CONTAMINANTS
- MIRACLE METALS

Virtually any dangerous substance can be handled safely in one of the wide variety of special enclosures manufactured by S. Blickman, Inc. These include dry boxes, biological safety cabinets, controlled-atmosphere boxes, fume hoods and many other types. Two are illustrated here.



MICRO-BIOLOGICAL SAFETY CABINET
Stainless steel.
One of many safety enclosures available.



VACUUM DRY BOX
Stainless steel.
For work in a controlled atmosphere.



SEND FOR VALUABLE REFERENCE ON SAFETY ENCLOSURES

S. BLICKMAN, INC.

6904 Gregory Ave. • Weehawken, N. J.

- ☐ Please send book on safety enclosures
☐ Also send catalog on laboratory furniture

NAME _____

TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____

Blickman-Built for Years of Reliable Service

See us at Booth #59, Microbiology Show, Sheraton-Park Hotel, Washington, D. C. — May 3-7.

16-17. **Fiber Soc.**, spring meeting, Charlotte, N.C. (I. Rebenfeld, P.O. Box 625, Princeton, N.J.)

16-17. **Textile Inst.**, annual conf., Leeds, England (D. B. Moore, 10 Blackfriars St., Manchester 3, England)

16-18. **Eastern Psychological Assoc.**, Philadelphia, Pa. (M. A. Iverson, Queens College, Flushing 67, N.Y.)

16-18. **Teaching of Foreign Languages**, 1964 northeastern conf., Washington, D.C. (S. Isaacs, 1110 Patterson Plank Rd., North Bergen, N.J.)

16-18. **Western Psychological Assoc.**, annual, Portland, Ore. (J. Matarazzo, Univ. of Oregon Medical School, Portland)

16-19. **Cooper Ornithological Soc.**, annual, San Diego, Calif. (C. V. Duff, 2911 Antelo View Dr., Los Angeles 24, Calif.)

17-18. **Arkansas Acad. of Science**, Conway. (R. R. Corey, Dept. of Botany and Bacteriology, Univ. of Arkansas, Fayetteville)

17-18. **Iowa Acad. of Science**, Decorah. (D. C. Foley, Iowa State Univ., Ames)

17-18. **Resonance Physics**, New York State section, American Physical Soc., Corning, N.Y. (J. T. Kerr, Corning Glass Works, Corning)

17-19. **Association of Southeastern Biologists**, 25th annual, Atlanta, Ga. (W. D. Burbanck, Dept. of Biology, Emory Univ., Atlanta)

18-23. **American Ceramic Soc.**, 66th annual, Chicago, Ill. (ACeS, 4055 N. High St., Columbus 14, Ohio)

19-22. **Association for Educational Data Systems**, natl. conv., Santa Barbara, Calif. (J. Caffrey, System Development Corp., Santa Monica)

19-22. **American Oil Chemists' Soc.**, 55th spring meeting, New Orleans, La. (AOCS, 35 E. Wacker Dr., Chicago 1, Ill.)

19-25. **Aerospace Electrotechnology**, intern. conf., Phoenix, Ariz. (A. A. Sorensen, Mail 3016, The Martin Co., Baltimore 3, Md.)

20-21. **Solar-Terrestrial Relationships**, symp. of Intern. Scientific Radio Union, American Geophysical Union, American Astronomical Soc., Washington, D.C. (M. G. Morgan, U.S. Natl. Committee, URSI, Dartmouth College, Hanover, N.H.)

20-22. **Radioisotope Conf.**, 2nd annual, Gatlinburg, Tenn. (R. T. Overman, Special Training Div., Oak Ridge Inst. of Nuclear Studies, P.O. Box 117, Oak Ridge, Tenn.)

20-23. **American Mathematical Soc.**, New York, N.Y. (G. L. Walker AMS, 190 Hope St., Providence, R.I.)

20-24. **Medical Radioisotope Scanning**, symp., Athens, Greece. (E. H. Belcher, Div. of Isotopes, IAEA, Kärntnerring 11, Vienna 1, Austria)

20-24. **Research Administration Inst.**, American Univ., Washington, D.C. (American Univ., 1901 F St., NW, Washington 6, D.C.)

20-24. **Fluid Dynamic Aspects of Space Flight**, Marseilles, France. (Fluid Dynamics Panel, NATO, 64, rue de Varenne, Paris 7^e, France)

20-24. **American Soc. of Tool and Manufacturing Engineers**, annual, Detroit, Mich. (L. S. Fletcher, ASTME, 10700 Puritan Ave., Detroit 38)

LITTLE, BROWN



For a well-balanced coverage of the main concepts of both classical and modern genetics . . .

GENETICS

By Irwin H. Herskowitz
Hunter College

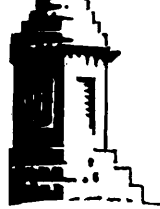
Alexander G. Bearn of the Rockefeller Institute reviews *Genetics in Science Magazine*:

"*Genetics* . . . is a sturdy and thorough introductory treatment of the science of genetics. . . . Herskowitz has managed to inject the vigor and pace of modern genetics into his book while recording the systematic interconnection of well-established genetic facts. . . . Herskowitz has used a novel approach in that many of the chapters have been focused on the work of particular named investigators, thus effectively incorporating authenticity into the text while encouraging the more adventurous student to pursue the original papers."

Genetics includes numerous drawings especially prepared for the text, as well as many photographs. Six Nobel Prize lectures and a translation from Mendel are included at the end of the text. Extensively class-tested. In cloth. 543 pages. 7 1/4 x 9 3/4.

LITTLE, BROWN and
COMPANY

34 Beacon Street
Boston, Massachusetts



20-25. American Acad. of Neurology, 16th annual, Denver, Colo. (AAN, 4307 E. 50 St., Minneapolis 17, Minn.)

21. Association for Symbolic Logic, New York, N.Y. (Mrs. R. Drew-Bear, Special Projects Dept., American Mathematical Soc., 190 Hope St., Providence, R.I.)

21-23. Joint Computer conf., Washington, D.C. (C. S. Jones, 8227 Woodmont Ave., Bethesda 14, Md.)

21-23. Engineering with Nuclear Explosives, 3rd "Plowshare" symp., Davis, Calif. (Plowshare Symp. Committee, Lawrence Radiation Laboratory, Building T-105, P.O. Box 808, Livermore, Calif.)

21-24. American Geophysical Union, Washington, D.C. (AGU, 1515 Massachusetts Ave., NW, Washington, D.C.)

21-30. Seismology, intergovernmental meeting, Paris, France. (UNESCO, Pl. de Fontenoy, Paris 7^e)

22-24. Institute of Electrical and Electronics Engineers, 16th annual southwestern conf., Dallas, Tex. (F. E. Brooks, Jr., Military Electronics Div., Ling Temco Vought, P.O. Box 6118, Dallas 75222)

22-24 British Inst. of Radiology, 25th congr., London, England (BIR, 32 Welbeck St., London, W.1)

22-25. National Council of Teachers of Mathematics, Miami Beach, Fla. (H. T. Karnes, Dept. of Mathematics, Louisiana State Univ., Baton Rouge 3)

23-25. American Gastroenterological conv., Philadelphia, Pa. (C. E. Nelson, 313 N. First St., Ann Arbor, Mich.)

28-1. Dallas-Southwest Industrial Trade Fair, Dallas, Tex. (C. L. Wells, P.O. Box 26010, Dallas 26)

29-1. Acoustical Fatigue, 2nd intern. conf., Dayton, Ohio (D. M. Forney, Research and Technology Div., U.S. Air Force Systems Command, Wright-Patterson Air Force Base, Dayton)

29-2. Peaceful Uses of Space, 4th natl. conf., Boston, Mass. (G. A. Rogovin, 501 Boylston St., Boston 16)

29-2. American Thyroid Assoc., annual, Rochester, Minn. (T. Winship, ATA, 110 Irving St., NW, Washington, D.C. 20010)

30-1. Institute of Hospital Administrators, annual, Edinburgh, Scotland. (IHA, 75 Portland Place, London, W.C.1, England)

30-1. Zonal Centrifugation Systems, Oak Ridge, Tenn. (F. C. Von der Lage, Office of Industrial Cooperation, Oak Ridge Natl. Laboratory, P.O. Box X, Oak Ridge, Tenn. 37831)

30-2. Agricultural History Soc., annual, Cleveland, Ohio (A. G. Bogue, History Dept., Univ. of Iowa, Iowa City)


30-2. American Cleft Palate Assoc., 22nd annual, Los Angeles, Calif. (ACPA, Parker Hall, Univ. of Missouri, Columbia 65202)

30-2. Midwestern Psychological Assoc., 36th annual, St. Louis, Mo. (F. A. Mote, Psychology Dept., Univ. of Wisconsin, Madison 53706)



30-3. Wilson Ornithological Soc., Kalamazoo, Mich. (P. B. Hofslund, Biology Dept., Univ. of Minnesota, Duluth)

30-6. Mexican Natl. Acad. of Medicine, Mexico City. (A. Lavarez-Bravo, Unidad de Congresos del Centro Mexico, Bloque "B", Av. Chauhtenoc 330, Mexico, D.F.)



HERE ARE THE FACTS...




Nalgene pipets are rugged . . . they're unbreakable!




Nalgene pipets can be read easily . . . brilliant, big "Magni-Vue" markings are permanently fused-on, last the full life of the pipet . . . non-adherent surface eliminates meniscus . . . you can see the entire liquid column with remarkable ease.




Nalgene pipets are accurate . . . individually calibrated to precise tolerances well within established standards.




Nalgene pipets dispense uniformly . . . orifices are constant . . . non-wetting surface drains dry rapidly.




Nalgene pipets are easy to clean . . . adhesion-resistant . . . require only a mild detergent.



Nalgene pipets can be autoclaved repeatedly . . . without damage.



Nalgene pipets are available in transfer, serological and measuring styles. Sizes from 1 ml to 10 ml, with limits of error not exceeding 0.06 ml. Priced from \$2.10 to \$2.80.

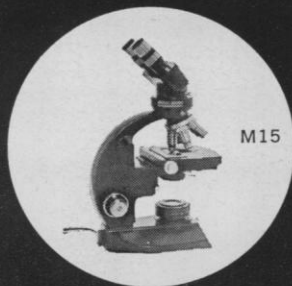


Nalgene pipets belong in your laboratory. See your lab supply dealer or write Dept. 2704, The Nalge Co., Inc., 75 Panorama Creek Drive, Rochester, N. Y. 14625.



Leader in quality plastic labware since 1949

Visit our Booths 360, 361 at the 48th Annual Meeting FASEB, Conrad Hilton, April 13-17, Chicago.



M15

VICKERS Phase Contrast MICROSCOPES



B0851

Superb phase contrast performance . . . with Vickers microscopes (conventional or inverted) . . . built-in annuli centering system and Magnification Changer available . . . choice of a variety of phase systems . . . normal or long (up to 18mm W.D. with high-dry lens) working distance . . . TRILUX system for rapid interchange between bright field, dark field and phase contrast . . . low power phase of tissue cultures in test tubes.



COOKE,
TROUGHTON
& SIMMS, Inc.

91 WAITE STREET, MALDEN 48, MASSACHUSETTS

May

1. Chemical Inst. of Canada, **Rubber Chemistry** Div., annual, Niagara Falls, Ont. (CIC, 48 Rideau St., Ottawa, Ont.)

1-2. Association of **Clinical Scientists**, Philadelphia, Pa., (R. P. MacFate, 54 W. Hubbard St., Chicago, Ill. 60610)

1-2. **Minnesota Acad. of Science**, Moorhead. (M. R. Boudrye, 3100 38th Ave. S., Minneapolis 6, Minn.)

1-2. **Nebraska Acad. of Sciences**, Lincoln. (C. B. Schultz, 101 Morrill Hall, Univ. of Nebraska, Lincoln 8)

1-2. **North Dakota Acad. of Science**, Fargo. (B. G. Gustafson, Univ. of North Dakota, Extension Div., Grand Forks)

1-3. Society of **Biological Psychiatry**, Los Angeles, Calif. (H. E. Himwich, SBP, Galesburg State Research Hospital, Galesburg, Ill.)

1-4. American **Psychoanalytic Assoc.**, annual, Los Angeles, Calif. (Mrs. H. Fischer, APA, 1 E. 57 St., New York N.Y. 10022)

2-3. Academy of **Psychoanalysis**, annual, Los Angeles, Calif. (J. R. Royce, The Academy, 125 E. 65 St., New York, N.Y. 10021)

3-7. **Electrochemical Society**, spring meeting, Toronto, Ont., Canada. (ES, 30 E. 42 St., New York, N.Y. 10017)

3-7. American Soc. for **Microbiology**, annual, Washington, D.C. (American Inst. of Microbiology, 115 Huron View Blvd., Ann Arbor, Mich.)

3-9. **Medical Biological Congr.**, Mutters, Austria. (P. Newhäuser, Abilindastr. 52a, München-Gräfelfing, Germany)

4-5. **Bioengineering**, 1st annual Rocky Mountain symp., U.S. Air Force Acad., Colorado Springs, Colo. (R. J. Gowan, Dept. of Electrical Engineering, U.S. Air Force Acad., Colorado Springs 80840)

4-5. **Chemical and Petroleum Instrumentation**, 5th natl. symp., Instrument Soc. of America, Wilmington, Del. (G. H. Robinson, Engineering Dept., E. I. duPont de Nemours Co., Wilmington)

4-6. Instrument Soc. of America, **Bio-medical Sciences** Div., 2nd natl. symp., Albuquerque, N.M. (R. F. Rust, Brooks, Feeger Assoc., 1238 Ortiz S.E., Albuquerque)

4-6. American Inst. of Aeronautics and Astronautics, **Aerospace Propulsion** meeting, Cleveland, Ohio. (AIAA, 500 Fifth Ave., New York, N.Y. 10036)

4-6. Aerospace **Instrumentation**, 10th natl. symp., Instrument Soc. of America, New York, N.Y. (ISA, 530 William Penn Pl., Pittsburgh 19, Pa.)

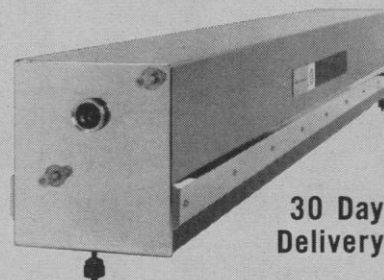
4-6. Asymptotic Solutions of **Differential Equations** and Their Applications, symp., Madison, Wis. (C. Wilcox, Mathematics Research Center, Univ. of Wisconsin, Madison 53706)

4-6. American Soc. for **Quality Control**, 18th annual conv., Buffalo, N.Y. (ASQC, 161 West Wisconsin Ave., Milwaukee 3, Wis.)

4-6. Inhaled **Radioactive Particles and Gases**, symp., Richland, Wash. (W. J. Bair, Biology Laboratory, Hanford Laboratories, Richland, Wash.)

4-7. **Biomedical Sciences Instrumentation**, 2nd natl. symp., Instrument Soc. of America, Univ. of New Mexico, Albuquerque. (P. F. Salisbury, St. Joseph

The first Ultra-Violet Laser



30 Day
Delivery

UV PULSED GAS LASER

- Watts output, > 30 Lines, 3371Å
- PW 10-20 nsec, PRF 100 pps, up
- Shielded Power Supply

ALSO — ORANGE — GREEN — IR

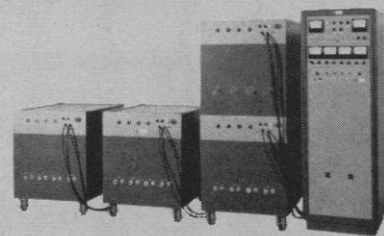
- Hundreds of watts, >250 Lines
- >10⁵ x output of CW Gas Lasers
- High PRFs, nanosecond PWs

MULTI-GIGAWATT KILOJOULE LASERS

- IR and Visible
- Oscillators, Amplifiers

ACCESSORIES

- High-Power Q-Switches
- Optical Probes
- High-Power Pulsers



Modular 12-144,000 Joule Energy Discharge System

MODULAR 12-KJ CAPACITOR BANKS

- From 1 to 12 may be obtained
- 1, 2, or 3 KJ increments/bank
- Fully interlocked

CHARGE & CONTROL UNIT

- 5 kv, 0.5 amp, constant-current
 - Charging Rate: 144KJ/2 min
 - Controls: modular, solid-state, automatic, adjustable
- From Stock



ENERGY SYSTEMS, INC.
3180 Hanover Street • Palo Alto, California
(415) 326-1640 • TWX: (415) 492-9354

(Formerly RADIATION at Stanford)

Hospital, 501 S. Buena Vista St., Burbank, Calif.)

4-8. American **Psychiatric Assoc.**, 120th annual, Los Angeles, Calif. (W. E. Barton, 1700 18th St., NW, Washington, D.C.)

4-8. **Strata Control and Rock Mechanics** intern. conf., New York, N.Y. (S. Boshkov, School of Mines, Columbia Univ., New York, N.Y.)

4-22. United Nations Commission on **Narcotic Drugs**, 19th session, Geneva, Switzerland. (UN, Palais des Nations, Geneva)

5-6. **Human Factors in Electronics**, 5th natl. symp., San Diego, Calif. (M. Freitag, 1910 Shire Dr., El Cajon, Calif.)

5-7. **Electronic Components Conf.**, Washington D.C. (J. Bohrer, 401 N. Broad St., Philadelphia, Pa.)

5-9. **Nuclear Radiation Hazards**, intern. symp., Intern. Civil Defence Organization, Monaco. (ICDO, 28 avenue Pictet-de-Rochemont, Geneva, Switzerland)

5-9. **Virginia Acad. of Science**, Charlottesville. (R. C. Berry, P.O. Box 8315, Richmond, Va.)

6-7. **Laser/Electron Beam**, seminar, Chicago, Ill. (R. Aptekar, Information Services Dept., American Soc. of Tool and Manufacturing Engineers, 10700 Puritan Ave., Detroit, Mich. 48238)

6-7. **Optical Masers Symp.**, Toronto, Ont., Canada. (R. N. Hall, General Electric Research Laboratory, P.O. Box 1088, Schenectady, N.Y.)

6-8. American Assoc. of **Genito-urinary Surgeons**, Rye, N.Y. (2020 93rd St., Cleveland 6, Ohio)

6-8. **Psychosomatic Research**, European conf., Athens, Greece. [G. S. Philippopoulos, 4 Monis Petraki St., Athens (140)]

6-8. Society for **Experimental Stress Analysis**, spring meeting, Salt Lake City, Utah. (B. E. Bossi, 21 Bridge Sq. Westport, Conn.)

6-9. **Acoustical Soc. of America**, 66th spring meeting, New York, N.Y. (W. Waterfall, 335 E. 45 St., New York, N.Y.)

7-8. **Vacuum Microbalance Techniques**, 4th conf., Pittsburgh, Pa. (F. A. Brassart, Westinghouse Research and Development Center, Beulah Rd., Pittsburgh 35)

7-8. International College of **Surgeons**, British section, summer meeting, London. (Secretariat, 1516 Lake Shore Dr., Chicago, Ill. 60610)

7-9. Society for American **Archaeology**, 30th annual, Chapel Hill, N.C. (W. H. Sears, Florida State Museum, Gainesville)

7-9. Society of **Neurological Surgeons**, Rochester, Minn. (SNS, Duke Univ. Medical Center, Durham, N.C.)

7-10. International Assoc. for **Bronchology**, 14th congr., Vienna, Austria. (Secretariat, Vienna Acad. of Medicine, 4, Alserstr., Vienna 9)

8-9. **Colorado-Wyoming Acad. of Science**, Denver, Colo. (Mrs. C. Norton, Dept. of Botany, Colorado State Univ., Fort Collins)

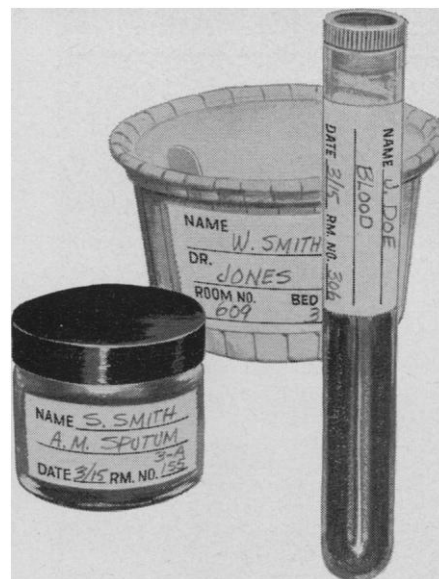
8-9. **North Carolina Acad. of Science**, Davidson. (J. A. Yarbrough, Meredith College, Raleigh, N.C.)

8-9. **Surgical Research Soc.**, Sheffield, England. (A. P. M. Forrest, Surgical Unit, Cardiff Royal Infirmary, Newport Rd., Cardiff, South Wales)

MINIMUM CONTACT—MAXIMUM SAFETY

with self-sticking TIME LABORATORY TAPES and LABELS

Self-sticking tapes and labels eliminate a direct source of personal contamination in laboratories. Pre-printed or plain tapes and labels provide a quick means of marking laboratory equipment. Just write necessary data on label (use pencil, pen or grease marker) and place it on any surface — glass, metal or plastic. Labels stick tight through autoclave (up to 250°), deep freeze (to -70°), or water bath. When no longer needed these tapes and labels can be quickly removed leaving no sticky residue. Vinyl Coated — available in white or colors.



See your laboratory or hospital supplier for a complete selection of Time Tapes and Labels.

PROFESSIONAL TAPE CO., INC.
365J Burlington Avenue • Riverside, Illinois 60546

GERM PLASM RESOURCES

**AAAS Symposium
Volume No. 66**

Edited by Ralph E. Hodgson

394 pages, 59 illustrations
Index, Cloth, April 1961.

**PRICE: \$9.75. For AAAS members,
Only \$8.50, prepaid.**

Origin of Germ Plasm—4 chapters

Need For and Utilization of
Additional Sources of Germ Plasm
—5 chapters

Developmental Programs in Crops
and Livestock —5 chapters

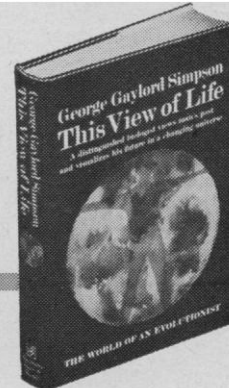
New Approaches in the Use of
Plant and Animal Germ Plasm
—6 chapters

Perpetuation and Protection of
Breeding Stocks —5 chapters

Order today from

**American Association
for the Advancement of Science**

1515 Massachusetts Avenue, NW
Washington, D.C. 20005



"...a brilliant and
simple picture of
what evolution
means, and of its
profound importance
for all of us."

—Sir Julian Huxley

**George Gaylord Simpson
THIS VIEW
OF LIFE**

THE WORLD OF AN EVOLUTIONIST

\$5.95 at all bookstores

HARCOURT, BRACE & WORLD

New Science Publications From PRENTICE-HALL

Foundations of Experimental Biology

Edited by Benjamin H. Willier, The Johns Hopkins University, and Jane M. Oppenheimer, Bryn Mawr College. Eleven classical, pioneering papers in the field of experimental embryology—first published between 1888 and 1939. These papers may not be found elsewhere in English in a single volume. They have been collected to stimulate an interest in the early history of experimental embryology and will give both student and teacher an opportunity to trace some of the foundation-stones on which the science of the developing embryo has since been built. Feb. '64, 288 pp., Text Pr. \$5.95

Electronic Spectra and Quantum Chemistry

by C. Sandorfy, University of Montreal, Canada. An introduction to research in electronic spectra, emphasizing the larger molecules of interest to the chemist. Describes the approximate wave mechanical methods making it possible to compute theoretically the frequencies and intensities of spectral bands. Feb. '64, 400 pp., Price \$14.95

Science and Ideas

Edited by Arnold B. Arons, Amherst College, and Alfred M. Bork, Reed College. An anthology of readings embracing the history, nature, and limitations of scientific thought, which stresses the interaction between science and other aspects of our culture. The readings were carefully selected to include a wide range of approaches, from the narrative and descriptive to the technical and mathematical. Feb. '64, 278 pp., paperbound, Text Pr. \$3.95

Principles and Applications of Rheology

by A. G. Fredrickson, University of Minnesota. The general and non-specialized approach of this text enables the student to cover a wide range of rheological theory, and obtain a balanced knowledge of theory, experiment, and practice. It examines the rheological behavior of materials in terms of invariant equations of state, with care given to formulating the proper invariance of the equations. Feb. '64, 326 pp., Text Pr. \$9.75

r Subject to Reference Discount

For approval copies,
write: Box 903

PRENTICE-HALL, INC.
Englewood Cliffs, New Jersey

8-9. **Surface Physics**, Washington State Univ. Pullman. (E. E. Donaldson, Physics Dept., Washington State Univ., Pullman)

8-20. **Space Research**, 7th plenary meeting, ICSU committee, Florence, Italy. (E. R. Dyer, Jr., National Acad. of Sciences-National Research Council, 2101 Constitution Ave., Washington, D.C.)

10-14. **Cardiology**, 3rd Asian-Pacific Congr., Kyoto, Japan. (S. Hayase, Medical Clinic, Kyoto Univ. Hospital, Sakyo-ku, Kyoto)

10-14. **French Soc. of Ophthalmology**, 71st Congr., Paris. (M. A. Dollfus, Société Française d'Ophthalmologie, 27, rue du Faubourg-Saint-Jacques, Paris 16°)

10-14. **American Proctologic Soc.**, Philadelphia, Pa. (APS, 7815 East Jefferson, Detroit 14, Mich.)

10-15. **Photographic Science and Engineering**, intern. conf., Palisades Park, N.J. (Executive Secretary, Soc. of Photographic Scientists and Engineers, Box 1609, Main Post Office, Washington, D.C.)

11-13. **Aerospace Electronics**, 16th natl. conf., Dayton, Ohio. (Y. Jacobs, 1917 Burbank Dr., Dayton 45406)

11-14. **Society for Industrial and Applied Mathematics**, spring meeting, Washington, D.C. (SIAM, Box 7541, Philadelphia 1, Pa.)

11-14. **American Urological Assoc.**, annual, Pittsburgh, Pa., (AUA, 1120 North Charles St., Baltimore, Md.)

11-16. **Assessment of Radioactive Body Burdens in Man**, symp., IAEA, Heidelberg, Germany. (IAEA, Div. of Public Information Kärntnering 11, Vienna, Austria.)

11-14. **Aerospace Medical Assoc.**, 35th annual, Bal Harbour, Fla. (W. J. Kennard, c/o Washington Natl. Airport, Washington, D.C. 20001)

11-14. **Biological Editors**, conf., Ann Arbor, Mich. (R. L. Zwemer, Committee on European Editors, c/o American Physiological Soc., 9650 Wisconsin Ave., Bethesda, Md. 20014)

11-16. **International College of Surgeons**, 14th intern. Congr., Vienna, Austria. (S. E. Henwood, 1516 Lake Shore Dr., Chicago, Ill. 60610)

12. **American Inst. of Chemical Engineers**, tri-sectional symp., Newark, N.J. (R. H. Dodds, Gibbs & Hill, Inc., 393 Seventh Ave., New York, N.Y.)

13-14. **Society of Plastics Engineers**, plastics in space, conf., Garden City, N.J. (D. Hassel, Grumman Aircraft Engineering Corp., Bethpage, L.I., N.Y.)

13-15. **Biomathematics and Computer Science in the Life Sciences**, 2nd annual symp., Houston, Tex. (Univ. of Texas Graduate School of Biomedical Sciences, 102 Jesse Jones Bldg., Texas Medical Center, Houston 77025)

13-15. **Society of Professional Well Log Analysts**, 5th intern. symp., Midland, Tex. (F. Wheeler, SPWLA, P.O. Box 4713, Tulsa 14, Okla.)

14-15. **Radiochemical Processing Symp.**, Buffalo, N.Y. (R. F. Lumb, Western New York Nuclear Research Center, Power Drive, Buffalo 14214)

14-15. **Scandinavian Biochemistry Meeting**, Stockholm, Sweden. (Sveriges Bio-kemiska Körenig, Karolinska Inst., Stockholm 60)

14-16. **American Inst. of Industrial**

Engineers, 15th annual conf., Philadelphia, Pa. (W. J. Jaffe, Dept. of Management Engineering, Newark College of Engineering, Newark, N.J.)

14-16. **Central States Anthropological Soc.**, annual, Milwaukee, Wis. (N. O. Lurie, Dept. of Anthropology, Univ. of Wisconsin, Milwaukee 11)

14-16. **Society of Technical Writers and Publishers**, 11th annual conv., San Diego, Calif. (C. M. Johnson, U.S. Navy Electronics Laboratory, San Diego 92132)

16-2. **European Energy Conf.**, Paris, France. (H. Perdon, Institut Français des Combustibles et de l'Energie, 3, rue Henri-Heine, Paris 16°)

17-20. **American Inst. of Chemical Engineers**, natl. meeting, Pittsburgh, Pa. (F. J. Van Antwerpen, 345 E. 47 St., New York, N.Y. 10017)

18-20. **Radiation Research Soc.**, 12th annual, Miami Beach, Fla. (G. D. Adams, Radiological Laboratory, Univ. of California Medical Center, San Francisco 22)

18-20. **Water**, 2nd conf., Technical Assoc. of the Pulp and Paper Industry, Green Bay, Wis. (H. O. Teeple, TAPPI, 360 Lexington Ave., New York, N.Y.)

18-21. **Society of Economic Paleontologists and Mineralogists**, Toronto, Ont., Canada. (R. H. Dott, Box 979, Tulsa 1, Okla.)

18-21. **American Assoc. of Petroleum Geologists**, 49th annual conv., Toronto, Ont., Canada. (R. E. King, American Overseas Petroleum, Ltd., 485 Lexington Ave., New York, N.Y. 10017)

19-20. **Council on Medical Television**, 6th annual, Atlanta, Ga. (S. A. Agnello, Box 3163, Duke Univ. Medical Center, Durham, N.C. 27706)

19-21. **Microwave Theory and Techniques**, intern. symp., New York, N.Y. (H. L. Browman, Airborne Instruments Laboratory, Deer Park, N.Y. 11729)

19-22. **German Metallurgical Soc.**, general assembly, Bremen, (Deutsche Gesellschaft für Metallkunde, An der Alteburger Mühle 12, Köln-Marienburg, Germany)

19-22. **German Soc. for Applied Optics**, 65th, Gmunden am Traunsee. (H. Volkman, Deutsche Gesellschaft für Angewandte Optik, Zeppelinstr. 23, 7920 Heidenheim, Germany)

19-23. **Energy Metabolism**, 3rd symp., Ayr, Scotland. (European Assoc. for Animal Production, Corso Trieste, 67, Rome, Italy)

19-30. **International Electrotechnical Commission**, general meeting, Aix-les-Bains, France. (American Standard Assoc., 10 E. 40 St., New York 16)

20. **Memorial Hospital of Long Beach, medical staff symp.**, Long Beach, Calif., (G. X. Trimble, Memorial Hospital of Long Beach, 2801 Atlantic Ave., Long Beach 6)

20-23. **Canadian Assoc. of Geographers**, 14th annual, London, Ont. (CAG, P.O. Box 421, Ottawa, Ont., Canada)

20-27. **Air Pollution**, European conf., Strasbourg, Austria. (A. Stern, Div. of Air Pollution, U.S. Public Health Service, Washington, D.C. 20201)

20-28. **Modern Methods for Analysis of Organic Compounds**, symp., Eindhoven, Netherlands. (Gesellschaft Deutscher Chemiker, Postfach 9075, Frankfurt-am-Main, Germany)