

# SCIENCE

17 November 1961

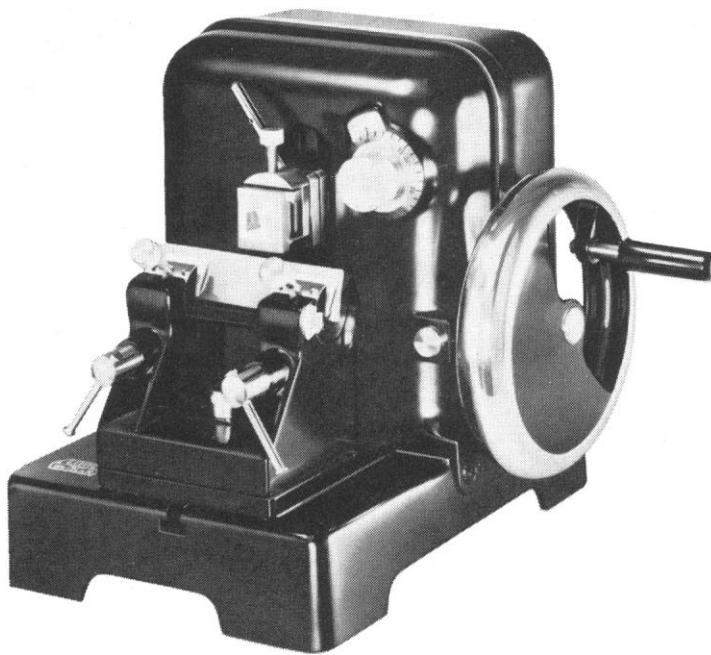
Vol. 134, No. 3490

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE





*for dependable, precision microtome sectioning*



## LEITZ LARGE MINOT ROTARY MICROTOME

The Large Minot Rotary Microtome (#1212) embodies traditional Leitz quality in a heavy design that insures the utmost rigidity and freedom from vibration. This microtome is ideally suited for rapid, accurate, serial sectioning of biological and pathological specimens and for industrial applications such as examination of textile fibers.

- precision micrometer mechanism permits selection of cutting thickness between 1 and 25 microns
- rigid knife blocks with rotating knife clamps, heavy ball-and-socket device for object clamp and paraffin stage
- ball-and-socket clamp permits rapid positioning of the specimen in any direction
- inclination of the knife readily adjustable as required
- adjustable knife block available for producing paraffin sections with obliquely positioned knife
- conveyor belt available for receiving series of sections

*Write today for illustrated brochure #53-8, "Leitz Microtomes."*



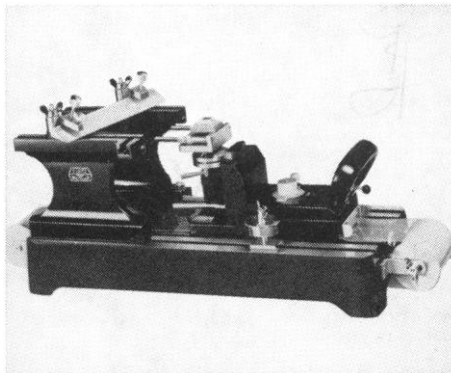
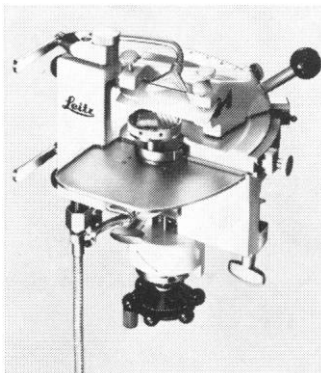
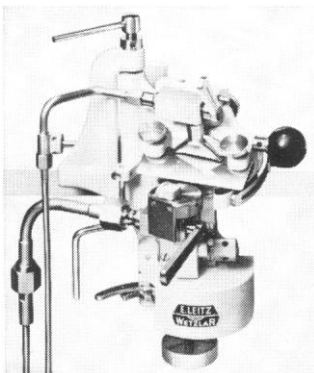
**E. LEITZ, INC., 468 PARK AVENUE SOUTH, NEW YORK 16, N. Y.**  
Distributors of the world-famous products of  
Ernst Leitz G.m.b.H., Wetzlar, Germany—Ernst Leitz Canada Ltd.  
**LEICA CAMERAS • LENSES • PROJECTORS • MICROSCOPES • BINOCULARS**

### Other Leitz Microtomes:

**Freezing Microtome (#1213)** for sections from 5 to 10 microns in 5-micron intervals.

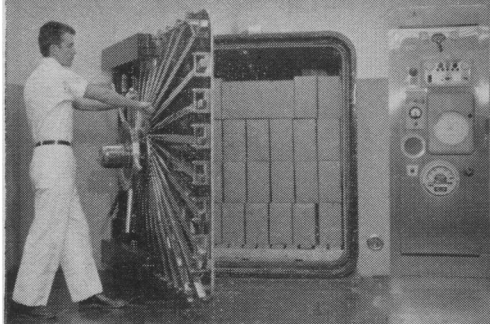
**Large Freezing Microtome (#1310)** for sections from 2.5 to 50 microns in 2.5-micron intervals.

**Base Sledge Microtome (#1300)** for large and/or very hard sections from 1 to 20 microns thick.



32559

# Bandages can be fun... they must be sterile



**CES CONTRACT STERILIZATION** will sterilize your product for you—permitting market-testing of new products without immediate equipment purchase.



**CES PROCESS DEVELOPMENT** will research and "pilot test" your production process for you, for best integration of sterilization.

Tommy is having a ball. But, while these bandages may make amusing playthings, their real purpose requires absolute sealed-in sterility. That's where Castle Engineered Sterilization, or "CES," comes in.

CES research provides the know-how and equipment to sterilize a thousand and one such hard-to-process items—from adhesives to photographic film. All sterilization is its province—the product, package, packaged product, selection and operation of equipment, and the handling, storage and shipment of sterile supplies.

Whatever your problem, if it involves sterilization, you can count on Castle Engineered Sterilization for the answers.

**WRITE** today for literature. Initial CES research and planning are without cost.



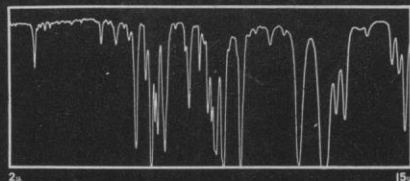
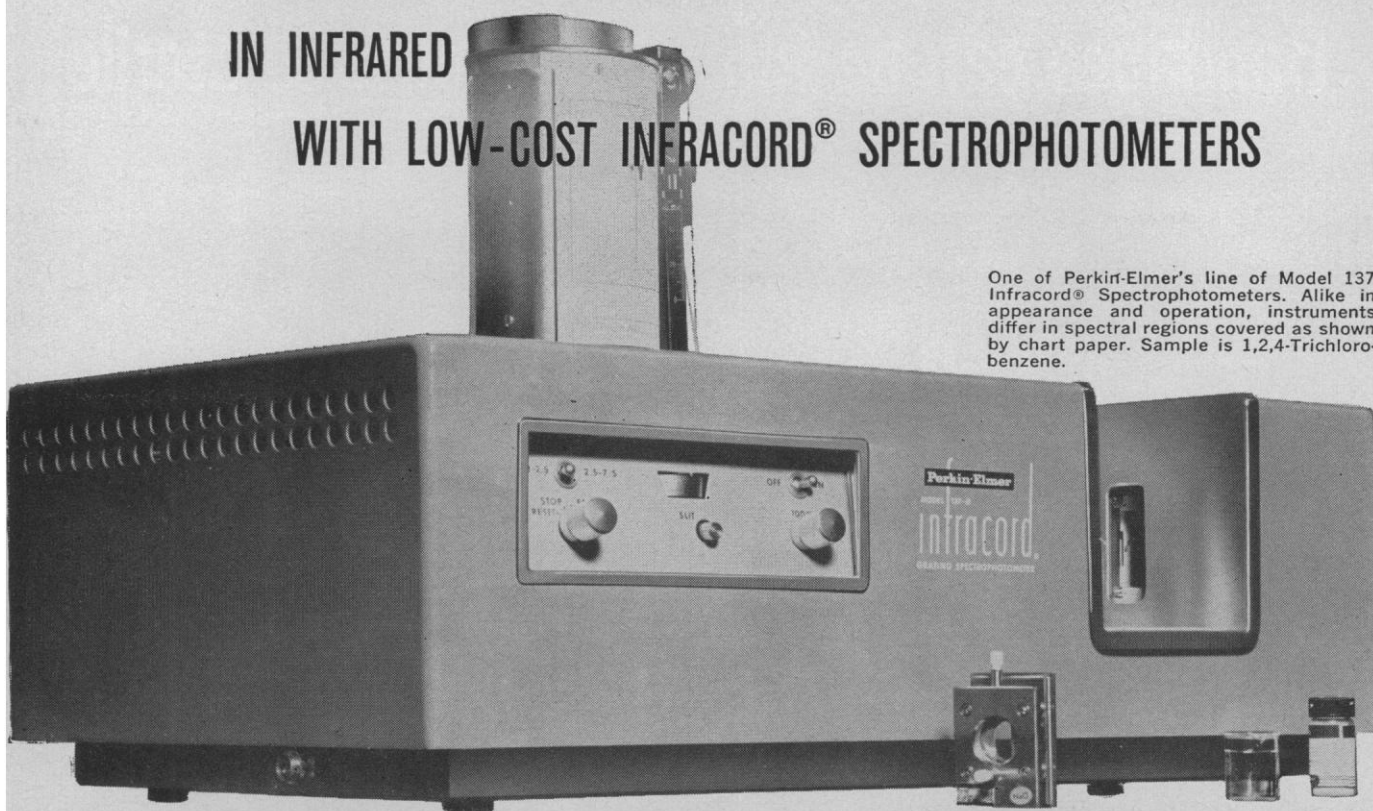
## Castle

**LIGHTS AND STERILIZERS**

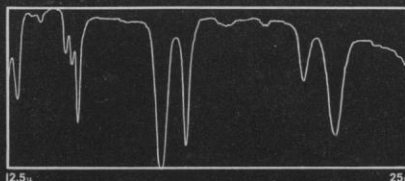
WILMOT CASTLE CO., 8011 E. HENRIETTA RD., ROCHESTER 18, N. Y.

# KEEP YOUR LAB AHEAD IN INFRARED WITH LOW-COST INFRACORD® SPECTROPHOTOMETERS

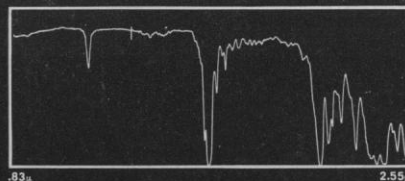
One of Perkin-Elmer's line of Model 137 Infracord® Spectrophotometers. Alike in appearance and operation, instruments differ in spectral regions covered as shown by chart paper. Sample is 1,2,4-Trichlorobenzene.



**NaCl Model 137.** Scans fundamental infrared range  $2.5\mu$  to  $15\mu$ —in 12 minutes; suitable for 70% of all analytical problems involving organic chemicals.



**KBr Model 137.** Scans from  $12.5\mu$  to  $25\mu$  in 6.5 minutes; provides data impossible or difficult to obtain at shorter wavelengths.



**Model 137-G.** Newest Infracord, this grating instrument covers the highly significant  $.83\mu$  to  $7.5\mu$  region with high resolution. Two-speed wavelength drive permits either 24-minute scan for quantitative analysis or 8-minute scan for survey work.

**INSTRUMENTS COVER THREE IR RANGES.** Three Infracord Spectrophotometers are available. All are double-beam instruments, similar in appearance, accuracy, reliability, simplicity, low cost and availability of accessories for sampling and special analyses. They differ only in the IR spectral region covered and in their optics.

Any laboratory can improve its analytical efficiency with one or more low-cost Perkin-Elmer Model 137 Infracord® Spectrophotometers.

The cost is one-half to one-third that of infrared instruments designed for more complex and demanding work. Despite this difference in price, P-E Infracords can handle most analytical problems a chemist in research and development, process or quality control, must perform. This means you don't pay for performance you don't need . . . nor for a high-salaried specialist, since a technician can operate the Infracord after a few minutes' instruction.

**For laboratories with no IR instrument,** an Infracord means cutting analytical time from hours to minutes . . . achieving accuracy and reliability unmatched by other techniques. Results are presented as standard spectra on notebook-

size paper for easy reference and filing as a permanent record.

**For large laboratories,** the use of a number of Infracords provides rapid, accurate analysis of the more routine samples . . . prevents delays at the spectroscopy lab . . . keeps more sophisticated IR equipment and skilled spectroscopists busy at problems only they can handle.

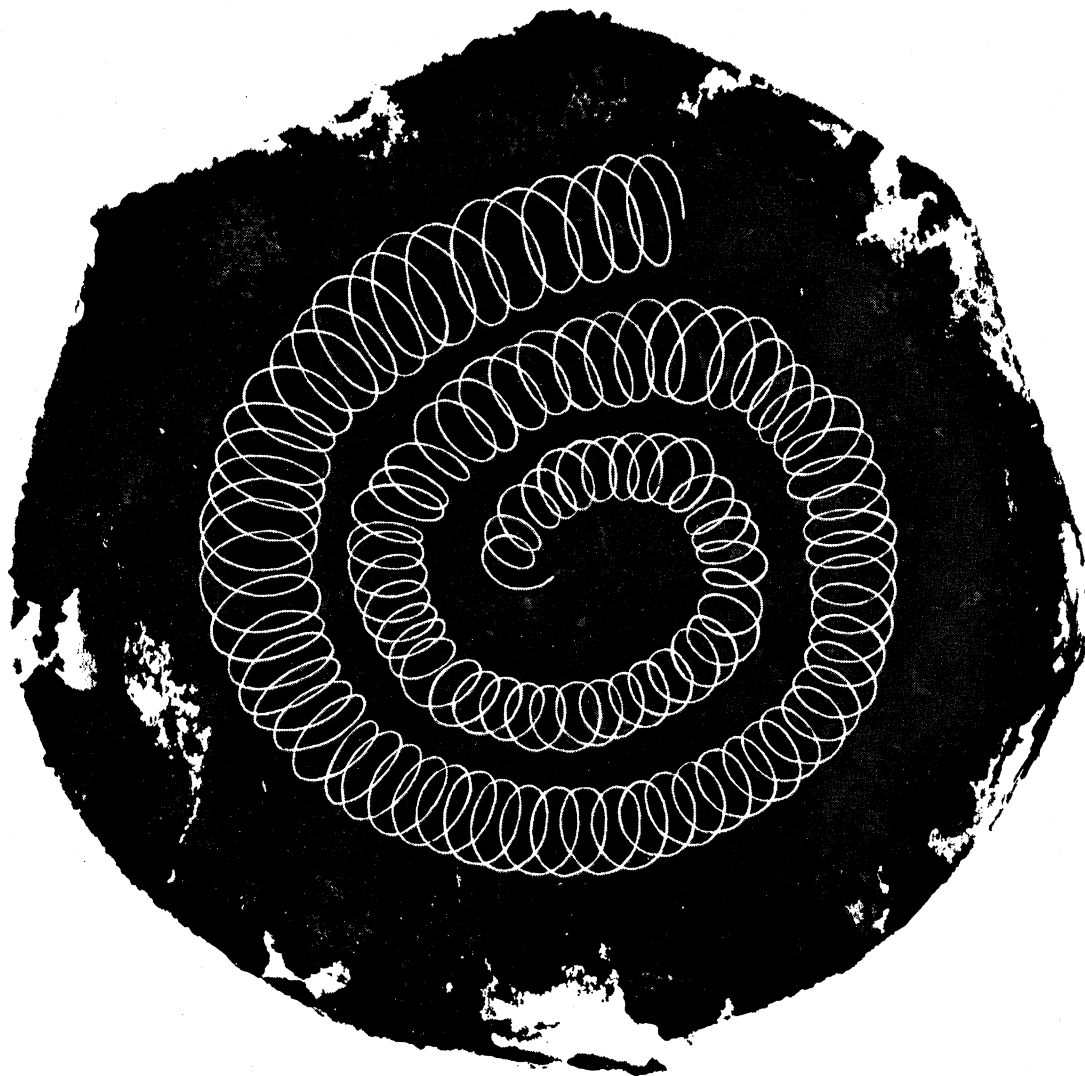
**For multi-purpose organizations,** an Infracord at each of a company's decentralized labs stems the flow of samples to the central research lab for IR analysis. It provides better analytical service in the field . . . leaves the central lab free, for more basic work.

For complete information on all Infracords, write to the Perkin-Elmer Corporation, 750 Main Avenue, Norwalk, Conn.

INSTRUMENT DIVISION  
**Perkin-Elmer** Corporation  
NORWALK, CONNECTICUT



<b>Editorial</b>	The Search and the End Product .....	1591
<b>Articles</b>	Stellar Scintillation: <i>W. M. Protheroe</i> .....	1593
	Stellar scintillation is shown to be a good indicator of the upper-air winds near the tropopause.	
	Competitive Exclusion: <i>B. C. Patten</i> .....	1599
	The exclusion principle is recast in the context of a generalized scheme for interspecific interactions.	
<b>Science and the News</b>	Money for Space: The Program's Managers Fear the Public Does Not Understand the Issue; Overhead Costs: Intangibles Make It Difficult To Compute Cost of University Research .....	16 02
<b>Book Reviews</b>	Psychology's Role in Economic Development: <i>E. E. Hagen</i> .....	1608
	Is there an identifiable personality trait that promotes or retards economic progress in societies?	
	J. H. Young's <i>The Toadstool Millionaires</i> , reviewed by <i>G. Sonnedecker</i> ; other reviews .....	1610
<b>Reports</b>	Depressant Agent from Walnut Hulls: <i>B. A. Westfall, R. L. Russell, T. K. Auyong</i> ....	1617
	Proof of an Adaptive Linkage Association: <i>M. Levitan</i> .....	1617
	Effect of Verbalization on Reversal Shifts in Children: <i>H. H. Kendler and T. S. Kendler</i> .....	1619
	Electron Diffraction from Coals: <i>S. Ergun and J. T. McCartney</i> .....	1620
	Accumulation of Potassium Anaerobically by Renal Medullary Slices: <i>E. L. Kean et al.</i> .....	1622
	Effects of Context on the Subjective Equation of Auditory and Visual Intensities: <i>K. Smith and A. H. Hardy</i> .....	1623
	Coesite Discoveries Establish Cryptovolcanics as Fossil Meteorite Craters: <i>A. J. Cohen, T. E. Bunch, A. M. Reid</i> .....	1624
	Electroretinogram of the Visually Deprived Cat: <i>B. L. Baxter and A. H. Riesen</i> .....	1626
	Predictions of the Growth Model for Normal Chicken Growth: <i>J. L. Kavanau</i> ....	1627
	An Age-Dependent Change in the Response of Fern Gametophytes to Red Light: <i>J. H. Miller and D. R. Wright</i> .....	1629
<b>Association Affairs</b>	128th Annual Meeting: Program Summary .....	1630
<b>Departments</b>	Electron Microscopy; Forthcoming Events .....	1636
<b>Cover</b>	Mold after a megashatter cone on a southeast face of McCray quarry at Kentland, Indiana. The megashatter cone has been blasted away by quarrying operations. The mold impression is partially covered with a thin coating of injected breccia. The exposed dimensions of this cone structure are 28 feet at the base and 160 feet high. See page 1624.	



**Said Svante Arrhenius:** *"The change of the logarithm of a chemical reaction rate constant with respect to temperature, is inversely proportional to the square of the absolute temperature."*

The aerospace industry is searching constantly for strong, light-weight, heat-resistant materials. Finely-spun glass fiber, bonded with a plastic binder, is beginning to exhibit superior properties. Until recently the glass fiber has been far more heat-resistant than any binder.

Scientists at Lockheed Missiles & Space Company, however, have developed a compatible binder. This now makes it necessary for the glass-producing industry to evolve a glass to match its superior heat-resistance.

Comparable successes are being achieved in dozens of disciplines in which Lockheed is engaged. As Systems Manager for the DISCOVERER, MIDAS, and other satellites, and the POLARIS FBM, Lockheed probes all areas of aerospace endeavor.

Lockheed Missiles & Space Company is located on the beautiful San Francisco Peninsula, in Sunnyvale and Palo Alto, California. Why not investigate future possibilities at Lockheed? Write Research and Development Staff, Dept. M-30D, 962 West El Camino Real, Sunnyvale, California. U.S. citizenship or existing Department of Defense industrial security clearance required. An Equal Opportunity Employer.

## **LOCKHEED MISSILES & SPACE COMPANY**

*A GROUP DIVISION OF LOCKHEED AIRCRAFT CORPORATION*

Systems Manager for the Navy POLARIS FBM and the Air Force AGENA Satellite in the DISCOVERER and MIDAS programs. Other current programs include SAINT, ADVENT and such NASA projects as OGO, OAO, ECHO, and NIMBUS.

SUNNYVALE, PALO ALTO, VAN NUYS, SANTA CRUZ, SANTA MARIA, CALIFORNIA • CAPE CANAVERAL, FLORIDA • HAWAII



GET READY FOR THE SPACE and SCIENCE ERA! SEE SATELLITES, MOON ROCKETS

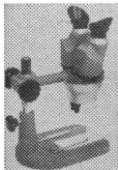
# AMAZING SCIENCE BUYS

for FUN, STUDY or PROFIT



American Made — Terrific Buy!

## STEREO MICROSCOPE



Years in development. Precision American made. Used for checking, inspecting, small assembly work. Up to 3" working distance. Clear, sharp, erect image. Wide, 8 dimensional field. 2 sets of objectives on rotating turret. 23X and 40X. 10 Days Free Trial.

Stock No. 85,056-W .....\$99.50  
f.o.b. Barrington, N.J.

**DIRECT MEASURING ATTACHMENT**—with regular comparator reticle for on-the-spot checks of linear dimensions, diameters, radii and angles—in millimeters and inches.

Stock No. 40,486-W .....\$10.00 Postpaid

**DIRECT MEASURING ATTACHMENT**—with sand measuring reticle for sand and soil analysis . . . or counting or measuring other particles of matter.

Stock No. 40,487-W .....\$10.00 Postpaid

## LEARN HOW YOU SEE, HEAR, TOUCH, TASTE AND SMELL



### 5 Scientific Twice Life Size Kits

Visually demonstrate the five senses. Find out how and why you experience sensation or enjoy any phase of human life. Lab models of the eye, ear, nose, skin, tongue and lower jaw. Eye model features unique life movement of eye and muscle. Ear offers full view of exterior and interior ears—has see-through features. Now for the first time available for individual, student and professional use at a reasonable price. Each kit includes full color anatomy chart.

Stock No. 70,464-W All five Senses .....\$10.00 Postpaid  
Stock No. 70,465-W Eye .....\$ 2.00 Postpaid  
Stock No. 70,466-W Ear .....\$ 2.00 Postpaid  
Stock No. 70,467-W Touch .....\$ 2.00 Postpaid  
Stock No. 70,468-W Smell .....\$ 2.00 Postpaid  
Stock No. 70,469-W Taste .....\$ 2.00 Postpaid

## THERMOMETER TIE BAR AND CUFF LINKS REGISTER AS HOT CONVERSATION PIECE



Ruggedly precise new style item in matched set of cuff links and tie bar—featuring non-breakable, accurately calibrated thermometers. Sensitive to a tolerance of 1 degree (although some wearers have noted violent fluctuations when worn in close proximity to certain blondes and redheads of the warmer sex!).

Easy to read. Indicia range from 20 (degrees) to 120 (degrees) Fahrenheit on circular dial. Silver plated, gift boxed—Tie Bar and Cuff Links also available separately.

Stock No. 1700-W Tie Clasp .....\$3.25 Ppd. tax incl.

Stock No. 1701-W Cuff Links .....\$6.55 Ppd. tax incl.

Stock No. 1702-W Set of Clasp & Links, .....\$8.75 Ppd. tax incl.



## SCIENCE TREASURE CHESTS

For Boys—Girls—Adults!

**Science Treasure Chest** — Extra-powerful magnets, polarizing filters, compass, one-way-mirror film, prism, diffraction grating, and lots of other items for hundreds of thrilling experiments, plus a Ten-Lens Kit for making telescopes, microscopes, etc. Full instructions included.

Stock No. 70,342-W .....\$5.00 Postpaid

**Science Treasure Chest DeLuxe**—Everything in Chest above plus exciting additional items for more advanced experiments including crystal-growing kit, electric motor, molecular model set, first-surface mirrors, and lots more.

Stock No. 70,343-W .....\$10.00 Postpaid

## LIFE SIZE VISIBLE HUMAN HEAD



Precise, Full Color, Take-apart Model

Study the most complex organ easily, inexpensively. Ideal for student, hobbyist, professional. You will be amazed at the detail. Molded from actual human skull. Eyes, ears, and teeth easily removed and disassembled for complete study. Entire brain, spinal cord and organs of mouth and throat presented in vivid detail. Amazingly low priced—conforms to rigid laboratory standards. 16-page fully illustrated medical handbook included.

Stock No. 70,447-W .....\$9.95 Postpaid



Photographers! This is an actual photograph of the moon taken through our Astronomical Telescope by a 17-year-old student.

See the Stars, Moon, Planets Close Up!

## 3" ASTRONOMICAL REFLECTING TELESCOPE

60 to 180 Power. An unusual Buy! Famous Mt. Palomar Type

You'll see the Rings of Saturn, the fascinating planet Mars, huge craters on the Moon, Star Clusters, Moons of Jupiter in detail. Galaxies! Equatorial mount with lock on both axes. Aluminized and over-coated 3" diameter high-speed f/10 mirror. Telescope comes equipped with a 60X eyepiece and a mounted Barlow Lens, giving you 60 to 180 power. An Optical Finder Telescope, always so essential, is also included. Sturdy, hardwood, portable tripod—FREE with Scope—Valuable STAR CHART plus 272 page "HANDBOOK OF HEAVENS" plus "HOW TO USE YOUR TELESCOPE" BOOK.

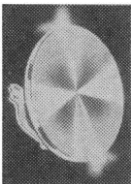
Stock No. 85,050-W .....\$29.95 Postpaid

4 1/2" Reflecting Telescope—up to 255 Power, all-metal pedestal mount. Stock No. 85,105-W .....\$79.50 F.O.B. Barrington, N.J.

## OFFSPRING OF SCIENCE...REALLY BEAUTIFUL!

### CIRCULAR DIFFRACTION-GRATING JEWELRY

1" diameter



Shimmering rainbows of gemlike color in jewelry of exquisite beauty—made with CIRCULAR DIFFRACTION-GRATING REPLICAS. Just as a prism breaks up light into its full range of individual colors, so does the diffraction grating. Promises to become a rage in current fashion.

Stock No. 30,349-W Earrings .....\$2.20 Pstpd.  
Stock No. 30,350-W Cuff Links .....\$2.20 Pstpd.  
Stock No. 30,372-W Pendant .....\$2.20 Pstpd.  
Stock No. 30,390-W Tie-Clasp .....\$1.65 Pstpd.

## NEW . . . PORTABLE ELECTRIC GREENHOUSE FOR YEAR-ROUND GARDENING MAGIC



Now you can practice gardening as a hobby 12 Months a year! Grow endless varieties of plants to maturity summer and winter . . . experiment continuously with plant growth and development. Thermostatically controlled temperature and humidity for rapid germination of seed, rooting of cuttings, and maximum growth potential. Size 15" x 18", with styro-foam base, 25-watt heater and thermostat. 2 polystyrene planter trays, clear styrene lid. 2 sizes avail. ea. incl. bag of growing medium.

Stock No. 70,490-W Low-lidded model, 7" high \$14.95 Pp.  
Stock No. 70,491-W High-lidded model, 15" high \$21.95 Pp.

## Experiment in Plastics with New PLASTICS ENGINEERING SET



Keep pace with advances in plastics technology. Innumerable profit opportunities. Designed for working knowledge for non-plastics technicians, etc. Teaches how to identify and shows unusual properties and behavior of different plastics. Demonstrates heat forming, heat sealing, cementing. Depicts methods of foam casting, solid casting, rotational casting, slush molding. Make plastic products by injection molding and blow molding. Kit 15" x 6" x 11 1/2". Incl. non-tech. instr. manual.

Stock No. 70,456-W .....\$25.00 Postpaid

## NOW . . . BE YOUR OWN WEATHERMAN!



**WEATHER STATION MARK I** performs all measurements and computations for professional weather forecasts. Rise and fall of fluid in Cape Cod Glass shows changes in barometric pressure. Also compute wind speed and direction, measure rainfall, figure dew point, read wet-bulb temperature, etc. Weather manual included—clear instructions for calculating the Temperature-Humidity Index and relative humidity. Fully portable. Panels and packaging of heavy polyesterene.

Stock No. 70,488-W 15" x 6" x 8 1/4" .....\$9.95 Pstpd.

DE LUXE ADVANCED MODEL MARK II

Stock No. 70,489-W 15" x 6" x 11 1/2" .....\$19.95 Pstpd.

## MAKE YOUR OWN \$300 OVERHEAD PROJECTOR

FOR LESS THAN \$50



New Edmund Overhead Projector Optics Kit plus locally purchased materials gives you projector comparable to models setting for \$300 and up. Ideal for "in-school" and industrial instruction. A remarkably versatile teaching aid. Terrific for cartoon talks and lecture work. Operates in lighted room. Kit includes projection lens, condenser lens, lamp, socket, and easy-to-follow directions.

S. N. 70,514-W .....\$15.00 Postpaid

## EXCITING NEW LOW-COST MOON MODEL—AN OUTER-SPACE CONVERSATION PIECE

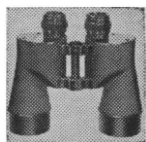


Exact replica in relief with 30,000 formations for study—peaks, craters, the 2-million-square-mile Oceans of Storms, etc. Formations scaled to size. Distance relationships help to narrow margins—valuable teaching aid and outer-space display for museums and institutions. With proper rotation and lighting it shows Moon Phases, and with "black light" spectacular effects! Made of tough, washable plastic in three colors, can be marked without damage. Reverse side blank to provide room for present and future space data. Wonderful gift for amateur astronomers—space enthusiasts. Exciting "conversation piece" for living room or den. Diam. 12" Wt. 3/4 lbs. Price remarkably low.

Stock No. 70,515-W .....\$12.50 Postpaid

## War Surplus American-Made 7x50 Binoculars

Big savings! Brand new! Crystal clear viewing—7 power. Every optical element is coated. An excellent night glass—the size recommended for satellite viewing. Individual eye focus. Exit pupil 7mm. Approx. field at 1,000 yds. is 376 ft. Carrying case included. American 7 x 50's normally cost \$274.50. Our war surplus price saves you real money.



Stock No. 1544-W .....Only \$74.80 postpd. (Tax included)

6 x 30 Binoculars—similar to above and a terrific bargain. Stock No. 963-W .....\$33.00 Pstpd. (Tax included)

## NEW LOW PRICE FLASHLIGHT POINTER

. . . Point It Out With Arrow Projected

Ideal for pointing out interesting features on movie and slide projection screens. Excellent lecture tool. For teacher use on maps, etc. Flashlight focuses an arrow where you point it.



Stock No. 60,117-W .....\$5.95 Postpaid

## MAIL COUPON for FREE CATALOG "W"

160 Pages!  
Over 1000 Bargains!

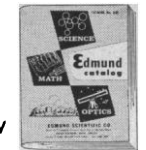
EDMUND SCIENTIFIC CO.,  
Barrington, N. J.

Please rush Free Giant Catalog-W

Name .....

Address .....

City .....Zone.....State.....



ORDER BY STOCK NUMBER . . . SEND CHECK OR MONEY ORDER . . . SATISFACTION GUARANTEED!

# EDMUND SCIENTIFIC CO. BARRINGTON, NEW JERSEY





AMERICAN ASSOCIATION  
FOR THE  
ADVANCEMENT OF SCIENCE

## Board of Directors

CHAUNCEY D. LEAKE, *Retiring President, Chairman*  
 THOMAS PARK, *President*  
 PAUL M. GROSS, *President Elect*  
 HARRISON BROWN DON K. PRICE  
 HENRY EYRING ALFRED S. ROMER  
 H. BENTLEY GLASS WILLIAM W. RUBEY  
 MARGARET MEAD ALAN T. WATERMAN  
 PAUL A. SCHERER, *Treasurer*  
 DAEL WOLFLE, *Executive Officer*

## Editorial Board

KONRAD B. KRAUSKOPF H. BURR STEINBACH  
 EDWIN M. LERNER WILLIAM L. STRAUS, JR.  
 PHILIP M. MORSE EDWARD L. TATUM

## Editorial Staff

DAEL WOLFLE HANS NUSSBAUM  
*Publisher Business Manager*

GRAHAM DUSHANE  
Editor

JOSEPH TURNER ROBERT V. ORMES  
*Associate Editor Managing Editor*  
 ELLEN E. MURPHY, *Assistant Editor*

NANCY TEIMOURIAN, *Assistant to the Editor*

*News:* HOWARD MARGOLIS, DANIEL S. GREENBERG, PATRICIA D. PADDOCK

*Book Reviews:* SARAH S. DEES

*Editorial Assistants:* SUE E. BERKE, NANCY S. HAMILTON, OLIVER W. HEATWOLE, EDGAR C. RICH, JOHN E. RINGLE, CONRAD YUNG-KWAI

*Staff Assistants:* LILLIAN HSU, GENEVIEVE M. QUADA

## Advertising Staff

EARL J. SCHERAGO, *Director*

BERNICE SCHWARTZ, *Production Manager*

*Sales:* RICHARD L. CHARLES (New York, N.Y., PE 6-1858); C. RICHARD CALLIS (Old Bridge, N.J., CL 4-3680); HERBERT BURKLUND (Chicago, Ill., DE 7-4973); DILLENBECK-GALAVAN (Los Angeles, Calif., DU 5-3991)

SCIENCE, now combined with THE SCIENTIFIC MONTHLY, is published each Friday by the American Association for the Advancement of Science at National Publishing Company, Washington, D.C. SCIENCE is indexed in the *Reader's Guide to Periodical Literature*.

Editorial correspondence should be addressed to SCIENCE, 1515 Massachusetts Ave., NW, Washington 5, D.C. Manuscripts should be typed with double spacing and submitted in duplicate. The AAAS assumes no responsibility for the safety of manuscripts. Opinions expressed by authors are their own and do not necessarily reflect the opinions of the AAAS or the institutions with which the authors are affiliated. For detailed suggestions on the preparation of manuscripts, see *Science* 125, 16 (4 Jan. 1957).

Advertising correspondence should be addressed to SCIENCE, Room 1740, 11 West 42 St., New York 36, N.Y.

Change of address notification should be sent to 1515 Massachusetts Ave., NW, Washington 5, D.C., 4 weeks in advance. Furnish an address label from a recent issue. Give both old and new addresses, including zone numbers.

Annual subscriptions: \$8.50; foreign postage, \$1.50; Canadian postage, 75¢. Single copies, 35¢. School year subscriptions: 9 months, \$7.00; 10 months, \$7.50. Cable address: Advancesci, Washington.

Copyright © 1961 by the American Association for the Advancement of Science.

## The Search and the End Product

Human groups that admit of a multiplicity of values and purposes are inevitably confronted by two perplexing tasks: they must assign relative weights to individual goals and allocate priorities in the use of their group's resources. A democratic society assumes that ordinary citizens as well as policy makers are, at least on an intuitive level, capable of making such evaluations in a rational and commensurable fashion and that they do so not wholly on the basis of individual self-interest. What are the most suitable common measures on which a society can base its decisions? Specifically, what are appropriate indices for comparison when we deal with science and its possible applications?

Support for the broad spectrum of scientific research now greatly exceeds a just-noticeable fraction of our national budget. Thus it becomes necessary to decide each year what fraction of a finite amount of resources is to be allocated to the search itself, to research facilities, and to the communication and application of research results already available, and how much is to be set aside for the education of the young. One must also decide how much is to be allocated to the various component parts of the total scientific effort, and it is here that groups who are interested in different end products make themselves heard.

Most scientists are notably and justifiably reluctant to extrapolate from their laboratory experience to the benefits that society may eventually derive from their search. They would feel uneasy were they asked to prescribe an ideal "mix" of physical, life, and behavioral sciences. On the other hand, they are also aware that easily measurable quantities are not always the most useful ones. They are, therefore, not overly impressed by the fact that it is obviously easier to assess the cost of research, of an education—or for that matter of human well-being and freedom—than to estimate the value of these commodities; accurate ledger entries do not necessarily constitute correct bases for decision making.

This state of affairs threatens to leave us without a common language—we might almost say without a common currency other than the dollar. We can, of course, take the view that the values involved are intangible and imponderable and that only a nation adequately trained in science might get more than a vague impression in terms of attitudes, expectations, and hopes. Can we really do no better job of translating what science has wrought than to refer to megatons or appliances on a per capita basis? Here is a challenge to the ingenuity of our scientific advisory boards and science administrators. Here also is a challenge to social scientists and humanists. Let us look for new significant indicators of scientific and technological progress. Let us try to convey how the search for scientific knowledge constitutes, in modern societies, one of the most basic commitments to a better future for mankind. There is little chance that we shall find an all-encompassing index or formula, but we need to experiment with a variety of partially valid yet broadly comprehensible measures.

We can scarcely hope to achieve voluntary planning for the benefit of both a free science and a free society as long as we have so few tools for convincing our fellow citizens that without search today there may be no end products tomorrow.—WALTER A. ROSENBLITH, *Massachusetts Institute of Technology*.



## See it anywhere between **3.5×** and **120×**

With Bausch & Lomb StereoZoom® Microscopes, just turning a knob gives you an infinite number of repeatable magnifications within the range selected. Powers available from 3.5× to 120×.

And, a new "Power Pod" optical design completely encloses the optical system in a single unit—keeps out dust and dirt, eliminates annoying image jump and blackout.

Why not see today's most versatile microscope soon in a free laboratory demonstration.

*Made in America,  
to the world's highest standard*

**BAUSCH & LOMB INCORPORATED**  
**75923 Bausch St., Rochester 2, N. Y.**

- ☐ Please arrange a free laboratory demonstration at my convenience.
- ☐ Please send Catalog D-15 with complete information on B&L StereoZoom Microscopes.

Name .....

Address .....

City ..... Zone ..... State .....

**BAUSCH & LOMB**

SINCE  1853



# Now-Determine Na and K Simultaneously ...in less than 20 seconds



**NEW BAIRD-ATOMIC FLAME PHOTOMETER PROVIDES TWO DETERMINATIONS FROM JUST ONE DILUTION WITH  $\pm 0.5\%$  REPRODUCIBILITY.**

A single 0.05cc sample (diluted 1:200) - and a flick of a switch...that's all it takes to accurately determine Na and K concentrations with the Baird-Atomic Flame Photometer, Model KY. Tedious calculations, between-run cleanings and recalibrations are gone forever.

Its exclusive B/A Multilayer Filters provide a rejection factor of more than 99.9% at unwanted wavelengths making it more efficient than spectrophotometer-type instruments. Compact and portable, the B/A Model KY operates equally well on manufactured, natural or bottle gas. Because of its sealed air system and thorough shielding, readings are not affected by tobacco smoke, solvent fumes or other airborne contaminants.

Write today for more complete information... Engineers and scientists - investigate challenging opportunities with Baird-Atomic.

**Only the Baird-Atomic Flame Photometer offers you the combined advantages of:**

- Instantaneous meq/liter readout
- Double beam instrument accuracy
- Simultaneous single - sample determinations

B/A Flame Photometer Condensed Specifications. Metals Analyzed and Guaranteed Sensitivity (1% of full scale):

Metal	meq/l	mg%	ppm
Na	0.001	0.002	0.02
K	0.0025	0.001	0.01
Li	0.028	0.02	0.02

Reproducibility:  $\pm 0.5\%$  av. Size: 15" x 17" x 16"  
Wgt.: 35 lbs.



**BAIRD-ATOMIC, INC.**

33 university road • cambridge 38, mass.

ADVANCED OPTICS AND ELECTRONICS...SERVING SCIENCE





# A GOLDMINE of fine

The new Kimble catalog features full lines of KIMAX Beakers, Erlenmeyer Flasks, Petri Dishes, plus a host of money-saving innovations

KIMAX hard glass beakers, from 1 to 4000 ml...

KIMAX Erlenmeyer flasks through 6000 ml...

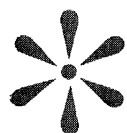
KIMAX Petri dishes, with covers and bottoms clearly distinguishable...

COLOR-CODED pipets... COLOR-CODED culture tubes... square flasks... round flasks... Raysorb low actinic ware...

these are but a few nuggets from the new Kimble Goldmine of fine laboratory glassware.

You'll find important improvements in hundreds of Kimble items in our new catalog. Take beakers, for instance. Made of tough KIMAX® hard glass. Beads are extra heavy. Glass is uniformly distributed throughout. Pour-out design minimizes dripping. Enameled marking area facilitates marking and erasures.

The entire Kimble line has been greatly expanded. Now, it's easy and profitable to buy the bulk of your needs from Kimble. Dealers in most states offer 28 per cent discount on orders of 150 cases or more.



EVERY DAY SEES SOMETHING NEW AT KIMBLE





# laboratory glassware



This new Kimble catalog should be on the shelf of every progressive laboratory. If you do not have one, mail the coupon today.

Kimble Glass Company, Subsidiary of Owens-Illinois  
Dept. SC11, Toledo 1, Ohio

Please send me the new Kimble catalog which includes the expanded KIMAX glassware line.

Name \_\_\_\_\_

Firm \_\_\_\_\_

Address \_\_\_\_\_

Position \_\_\_\_\_

**KIMBLE LABORATORY GLASSWARE**  
AN **Ⓛ** PRODUCT

**OWENS-ILLINOIS**  
GENERAL OFFICES • TOLEDO 1, OHIO

# APPLICATION FOR HOTEL RESERVATIONS

## 128th AAAS MEETING

### Denver, 26-31 December 1961

The hotels for the AAAS Denver meeting have established **special, low rates** and have reserved appropriately large blocks of rooms for this meeting. Thus everyone making room reservations for the AAAS meeting is assured substantial savings.

The list of hotels and the reservation coupons below are for your convenience in making your hotel reservation in Denver. Please send your application, *not* to any hotel directly, but to the AAAS Housing Bureau in Denver and thereby avoid delay and confusion. The experienced Housing Bureau will make assignments promptly; a confirmation will be sent you in two weeks or less.

If requested, the hotels will add a comfortable rollaway bed to any room, at \$3.00 per night. Mail your application now to secure your first choice of desired accommodations. All requests for reservations must give a definite date and estimated hour of arrival, and also probable date of departure.

#### AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

For a list of the headquarters of each participating society and section, see page 197, *Science*, 21 July. The Hilton is the AAAS headquarters hotel.

##### Rates for Rooms with Bath\*

Hotel	Single for one	Double for one	Double for two	Twin Beds for one	Twin Beds for two	Studio Twins	Suites
Hilton	\$8.50	\$10.00	\$14.00		\$14.00	\$15.00	\$27.00 to \$55.50
Brown Palace	8.00	9.00	13.00	\$10.00	15.00		24.00 to 65.00
Cosmopolitan	8.50	9.00	13.00	10.00	14.00		25.00 to 60.00
Shirley Savoy		7.50	10.00	9.00	12.00		25.00 to 40.00

\* All rooms are subject to a 2% Colorado State sales tax.

#### ----- THIS IS YOUR HOUSING RESERVATION COUPON -----

AAAS Housing Bureau  
225 West Colfax Avenue  
Denver 2, Colorado

Date of Application .....

Please reserve the following accommodations for the 128th Meeting of the AAAS in Denver, 26-31 December 1961:

##### TYPE OF ACCOMMODATION DESIRED

Single Room ..... Double-Bedded Room ..... Twin-Bedded Room ..... Studio Twins .....

Suite ..... Desired Rate ..... Maximum Rate .....

Number in party ..... Sharing this room will be: .....

(Attach list if this space is insufficient. The name and address of each person, including yourself, must be listed.)

.....  
.....

First Choice Hotel ..... Second Choice Hotel ..... Third Choice Hotel .....

DATE OF ARRIVAL ..... DEPARTURE DATE .....

(These must be indicated—add approximate hour, A.M. or P.M.)

NAME .....  
(Individual requesting reservation) (Please print or type)

ADDRESS .....  
(Street) (City and Zone) (State)

Mail this now to the Housing Bureau. Rooms will be assigned and confirmed in order of receipt of reservation.

## GRASSLANDS

Editor: Howard B. Sprague 1959

6" x 9", 424 pp., 37 illus., index, cloth. Price \$9.00, AAAS members' cash orders \$8.00. AAAS Symposium Volume No. 53.

This volume is intended as a review of knowledge on many aspects of grasslands resources. The 44 authors were selected by their own professional colleagues as being particularly competent to present the respective subjects. Thirty-seven papers are arranged under these chapter headings:

1. Sciences in Support of Grassland Research
2. Forage Production in Temperate Humid Regions
3. Engineering Aspects of Grassland Agriculture
4. Forage Utilization and Related Animal Nutrition Problems
5. Evaluation of the Nutritive Significance of Forages
6. Grassland Climatology
7. Ecology of Grasslands
8. Range Management

British Agents: Bailey Bros. & Swinfen, Ltd.,  
Hyde House, W. Central Street,  
London, W.C.1

AAAS, 1515 Mass. Ave., NW,  
Washington 5, D.C.

## Try UNITRON'S new POLARIZING MICROSCOPE

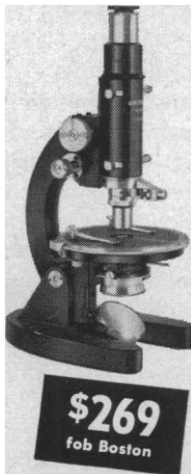
The Model MPS is a precision instrument designed to meet the exacting requirements of science, education and industry. Ideal for work in chemistry, crystallography, biology, as well as the technology of paper, glass, textiles and petroleum.

- Eyepieces: 5X (micro), 10X (cross.)
- Objectives: 4X, 10X, 40X, achromatic, strain-free, centerable
- Nosepiece: quick-change type
- Substage condenser: focusable, 3-lens, swing-out top mount, iris diaphragm
- Polaroid polarizer: rotatable 360°
- Polaroid analyzer: in sliding mount
- Bertrand lens: centerable
- Stage: 115mm diameter, revolves 360°, reads to 6" with vernier
- 2 Compensators: quarter-wave plate and first order red plate
- Focusing: both coarse and fine

FREE TEN-DAY TRIAL

Quantity prices on three or more

Accessory mechanical stage \$14.75



# UNITRON

INSTRUMENT COMPANY • MICROSCOPE SALES DIV.  
66 NEEDHAM ST., NEWTON HIGHLANDS 61, MASS.

Please rush UNITRON's Microscope Catalog 4-W-3

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_

**Vice Presidential Address.** Genetic variations in human structure and function and their influence on medical care, John B. Youmans, director of scientific activities, American Medical Association; vice president for Section N. Presentation of the 17th Theobald Smith Award. Genetic studies with human cells, T. T. Puck. Immunological aspects of human genetics, R. D. Owen. Origin and development of isozymes, C. L. Markert.

### Alpha Epsilon Delta

Thursday 28 December

**Career Opportunities in the Health Professions.** Program of Alpha Epsilon Delta, cosponsored by AAAS Sections C—Chemistry, F—Zoological Sciences, N—Medical Sciences, and Nd—Dentistry, and by Beta Beta Beta Biological Society. Arranged by Norman F. Witt, professor of chemistry, University of Colorado, national president, who will preside. Medical needs for the future, A. N. Taylor. Dental needs for the future, Reidar F. Sognaes. Panel discussion: Opportunities in medicine, Reginald H. Fitz, moderator. Panel members: Philip B. Price, Bill C. Garoutte, and Philip E. Smith. Panel discussion: Opportunities in dentistry, Hamilton B. G. Robinson, moderator. Panel members: Willard C. Fleming, Harold J. Noyes, and Ben C. McKinney.

**Luncheon and Address.** The challenges and opportunities in medical education, Robert J. Glaser, vice president for medical affairs, and dean, School of Medicine, University of Colorado Medical Center, Denver.

**Conferences with Admissions Officials.** Visit to University of Colorado Medical Center.

### American Physiological Society

The Society has arranged a joint program for session II of the American Astronautical Society's three-session symposium on Manned Lunar Flight. The Society is the cosponsor of sessions I and III of the symposium [*Science*, 134, 1438 (3 Nov. 1961)].

### American Psychiatric Association

Program chairman: David A. Hamburg, Stanford Medical Center, Palo Alto, California.

Wednesday 27 December

**Genetics and Evolution in Relation to Human Behavior.** Two sessions: Program of the Committee on Research of the American Psychiatric Association, cosponsored by AAAS Section I—Psychology, and the American Anthropological Association.

Session I, David A. Hamburg, presiding. An outline of human evolution, S. L. Washburn. Baboon behavior, S. L. Washburn and Irven DeVore. Evolution of primate social behavior, Irven DeVore.

Session II. Evolution of culture in Africa, J. Desmond Clark. Selective forces in the evolution of man, Ernst W. Caspari. What is "inheritance of behavior"? Theodosius Dobzhansky.

### Dentistry (Nd)

**Oral Aspects of Genetics.** Two-session symposium of AAAS Section Nd—Dentistry, cosponsored by AAAS Section N—Medical Sciences, the American College of Dentists, American Dental Association, and the International Association for Dental Research, North American Division.

Program chairman: Albert A. Dahlberg, University of Chicago.

Wednesday 27 December

Session I, Albert A. Dahlberg, presiding. Recent advances in dental genetics, Carl J. Witkop, Jr. The respective roles of twin, sibling, family, and population methods in dento-medical studies, Richard H. Osborne. Effects of heredity and environment on the development of the dentition, Jerome D. Niswander. Chromosome nondisjunctions and oral anomalies, Robert Gorlin. The effectiveness of selection in producing laboratory stocks genetically uniform for resistance or susceptibility to dental caries, Harrison R. Hunt and Samuel Rosen.

Session II, Albert A. Dahlberg, presiding. Family studies of the facial complex, Bertram Hanna. Some clinical aspects of genetic research in dentistry, Sidney L. Horowitz. Third molar polymorphism and dental genetics, Stanley M. Garn and Arthur B. Lewis. The regulative changes in tooth germs grown in tissue culture, Shirley Glasstone Hughes. Discussion by symposium participants.

Section Nd is a cosponsor of the program of Alpha Epsilon Delta, of Section N's four-session symposium,



Physiological and Biochemical Aspects of Human Genetics, and of the interdisciplinary symposium, Existing Levels of Radioactivity in Man and His Environment.

## Pharmacy (Np)

Wednesday 27 December

**Contributed Papers:** Hospital Pharmacy. Arranged by George F. Archambault, Don E. Francke, and Joseph A. Oddis.

Session I: George F. Archambault, presiding.

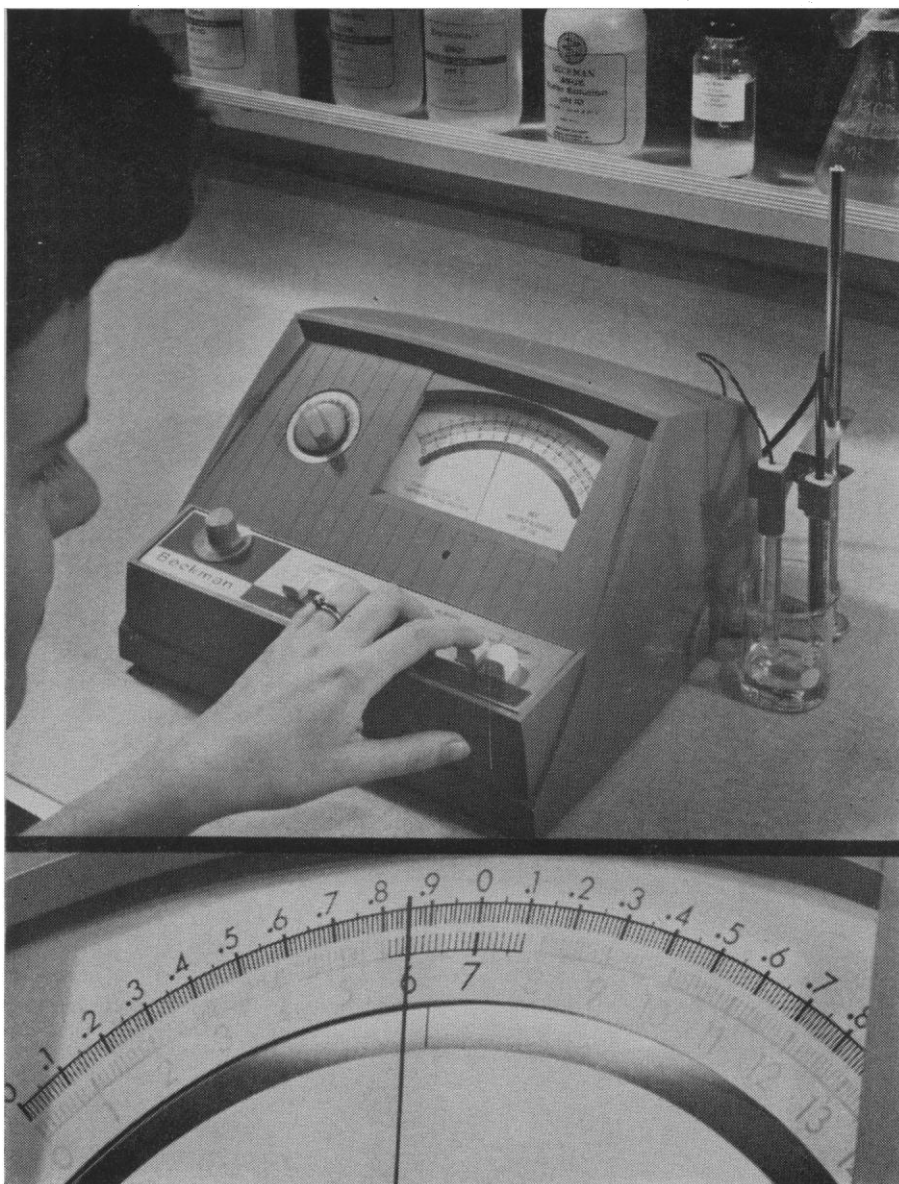
Hospital Pharmacy, Session II: Don E. Francke, presiding.

**Vice Presidential Address of Section Np.** George F. Archambault, presiding. Pharmacy and hospital pharmacy, Joseph A. Oddis, American Society of Hospital Pharmacists; Division of Hospital Pharmacy, American Pharmaceutical Association; and Vice President of Section Np.

Thursday 28 December

One of the four interdisciplinary symposia at the Denver meeting has been the responsibility of Section Np. The Interdisciplinary Symposium in the Biological-Medical Sciences, **Existing Levels of Radioactivity in Man and His Environment: Measurement and Significance**, is a joint program of AAAS Sections Np-Pharmacy, F-Zoological Sciences, G-Botanical Sciences, H-Anthropology, I-Psychology, N-Medical Sciences, Nd-Dentistry, O-Agriculture, and Q-Education. Arranged by John E. Christian, Purdue University, who will preside. Introductory remarks and radioisotope demonstrations, John E. Christian. Radioactivity levels in man and his environment—contribution and potential hazards of reactor and isotope-powered vehicles, Wright H. Langham. Existing levels of cosmic-ray produced radioactivity—present and potential applications to archeology, meteorology, geochronology, and oceanography, James R. Arnold. Measurements of the existing radioactivity of people and foods. Applications of nondestructive measurements of body composition (potassium, lean, fat, water), medical diagnosis, age studies, and fall-out studies. Ernest C. Anderson. The relationship of existing radiation levels to carcinogenesis, P. R. J. Burch. Question and discussion session.

The seven remaining sessions of the program of AAAS Section Np-Phar-



*Expand ANY 2 pH span full scale*

### **Read pH to 0.003...**The Beckman Model 76 Expanded

Scale pH Meter combines all these indispensable features to satisfy the advanced and growing precision requirements of the modern industrial laboratory:

- *Expansion of any 2 pH span full scale*
- *Readability and repeatability to 0.003 pH or 0.3 m.v.*
- *0-14 pH range and 0-1400 m.v. range*
- *Accurate to  $\pm 0.02$  pH or  $\pm 2$  m.v.*
- *AC amplifier insures drift-free performance*
- *Easy, push-button operation*
- *Direct-reading, mirror-backed scale*

The Model 76 may be used with a wide range of reliable Beckman standard or special electrodes and with a potentiometric recorder to provide permanent measurement records. For full information contact your Beckman laboratory apparatus dealer, or write for Data File 38-46-01.

**Beckman**

INSTRUMENTS, INC.

SCIENTIFIC AND PROCESS INSTRUMENTS DIVISION Fullerton, California

macy are cosponsored by the American Pharmaceutical Association, Scientific Section; American Association of Colleges of Pharmacy; American Society of Hospital Pharmacists; American College of Apothecaries; and the National Association of Boards of Pharmacy.

**Friday 29 December**

**Contributed Papers.** Arranged by John E. Christian. John Autian, University of Texas, and Wayne Kessler, Purdue University, presiding.

## Meetings

### Electron Microscopy

The 19th annual meeting of the Electron Microscope Society of America was held in Pittsburgh, Pennsylvania, from 23 to 26 August 1961. This meeting brought together more than 706 active workers in electron microscopy from 24 states, Canada, Australia, Great Britain, Belgium, Germany, and

Japan. It was the largest meeting in the history of the society. There were ten general sessions of contributed papers (five in the biological fields, five in non-biological areas), a special session on techniques, and three symposia. There were 19 scientific exhibits and some 180 contributed papers on the techniques and applications of the electron microscope to studies in biology, chemistry, medicine, cancer, metallurgy, electron diffraction, and related fields.

In the symposium on the contribution of electron microscopy to polymer morphology, organized by R. G. Scott (Du Pont Experimental Station), seven experts in this field discussed, respectively, x-ray diffraction as applied to polymers, spherulites, electron diffraction as applied to single crystals, the morphology of polymers, fiber microscopy, and electron diffraction as applied to synthetic fibers. This symposium summarized the new phases of technology and applications of electron microscopy in the field of polymer science.

Rubin Borasky (University of Illinois) arranged and directed the symposium on ultrastructure of protein fibers. The papers on physical, chemical, and mechanical properties of protein fibers in muscle and keratin summarized the recent contributions to the science of fiber structure.

The symposium on the fine structure of viruses, arranged by A. F. Howatson (University of Toronto), was especially noteworthy in that the presentation of papers on recent advances in fine structure, animal virus structure, electron microscopy of nucleic acids and proteins, structures of bacteriophages, and studies on the fine structure of foot-and-mouth-disease virus brought together, in a very logical sequence, information on the recent improvements in the techniques of replication, shadow-casting, thin sectioning, and "negative-contrast" staining and their application and interrelationships in obtaining new information on the structure of viruses.

President D. Maxwell Teague and president-elect Keith R. Porter and the organizing committee announced plans and arrangements for the 5th International Congress for Electron Microscopy, to be held in Philadelphia from 29 August through 5 September 1962.

The Electron Microscope Society of America will be host to the International Federation of Electron Microscope Societies at this congress, which will emphasize the new and unique

AMINO ACIDS • PEPTIDES • FINGERPRINTING

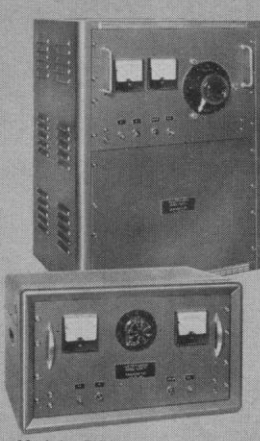


Model ET48 Electrophoresis Tank



Models EHV 2000 & 5000

**SERVONUCLEAR  
HIGH VOLTAGE  
PAPER  
ELECTROPHORESIS**



Precision high voltage systems by SERVONUCLEAR cover a wide range of high voltage and high current requirements for SERVONUCLEAR ELECTROPHORESIS equipment.

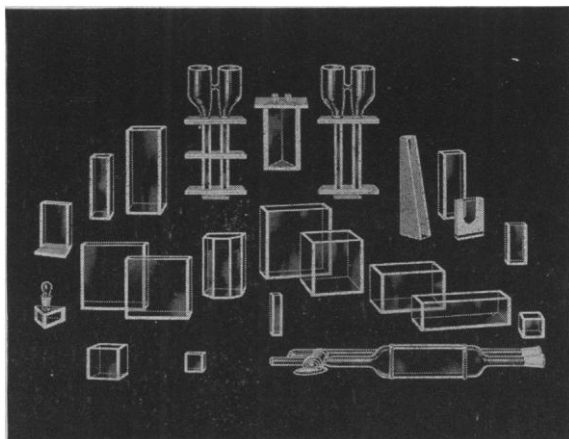
5000 VOLT SYSTEM	2000 VOLT SYSTEM
• Accepts 20" x 48" paper sheets.	• Accepts 20" x 22½" paper sheets.
• Amino Acids.	• Fingerprint identification.
• 2 Tanks required for two stage separations.	• Peptides.

\* READ THE RESULTS. NEW ELECTROPHORESIS "PROCEDURES MANUAL" with its up-dated laboratory applications should be added to your instrumentation facilities. Write today, on Institution letterhead for your copy.

**SERVONUCLEAR CORP.**

28-21 Astoria Blvd. • Long Island City 2, N.Y. • YE 2-3353

# GLASS ABSORPTION CELLS made by **KLETT**



— SCIENTIFIC APPARATUS —  
Klett-Summerson Photoelectric Colorimeters—  
Colorimeters — Nephelometers — Fluorimeters—  
Bio-Colorimeters — Comparators — Glass Stand-  
ards—Klett Reagents.

**Klett Manufacturing Co.**  
179 East 87 Street, New York, New York

**H<sup>3</sup>**

**C<sup>14</sup>**

**High Specific Activity**

**ALDOSTERONE-1,2-H<sup>3</sup>**

**100 mc/mg**

**\$80/250  $\mu$ c**

**\$145/500  $\mu$ c**

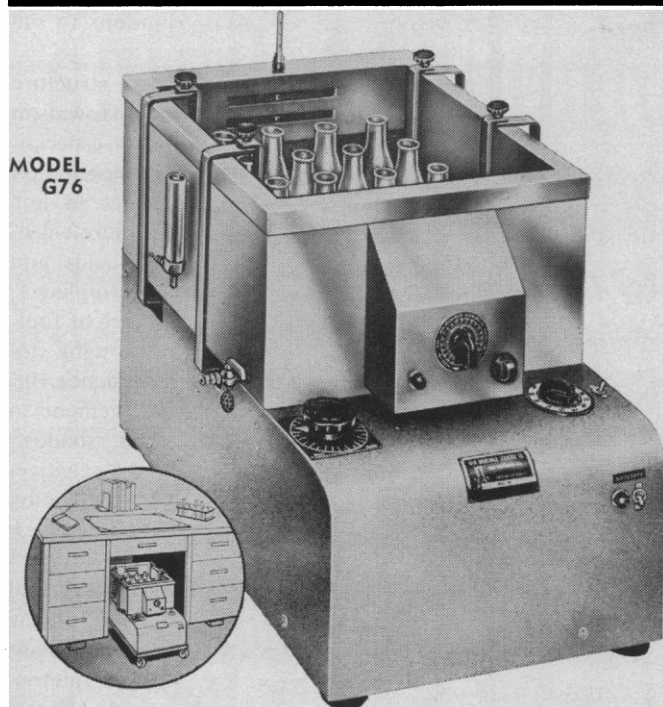
**\$250/mc**

**\$400/2 mc**

**CATALOG ON REQUEST**

**new england nuclear corp.**

575 ALBANY STREET, BOSTON 18, MASS. HANcock 6-7311



Model G76 with  
Space-Saving Dolly

**UNCONDITIONAL  
1-YEAR WARRANTY**

# GYROTORY<sup>®</sup> WATER BATH SHAKER

**For Reproducible Temperature and Agitation**

- Variable speed control, from 85 to 285 rpm or 140 to 400 rpm.
- Heats rapidly to pre-set temperatures from ambient to 100° C. within  $\pm 0.5^\circ$  C.
- Adjustable level device automatically maintains desired water level in the bath.
- Triple-eccentric-shaft drive transmission assures smooth, uniform agitation of all flasks.
- Built with precision for continuous operation.
- Performance is cool, quiet, vibrationless.
- A bench-top unit with interchangeable platforms having large capacity for flasks, tubes, and beakers. Used with gaseous atmospheres.
- Operates under lab benches and desks with space-saving dolly accessory.
- Models available with reciprocating action.



**NEW BRUNSWICK SCIENTIFIC CO., INC.**  
PRECISION LABORATORY APPARATUS  
P.O. BOX 606, NEW BRUNSWICK, NEW JERSEY

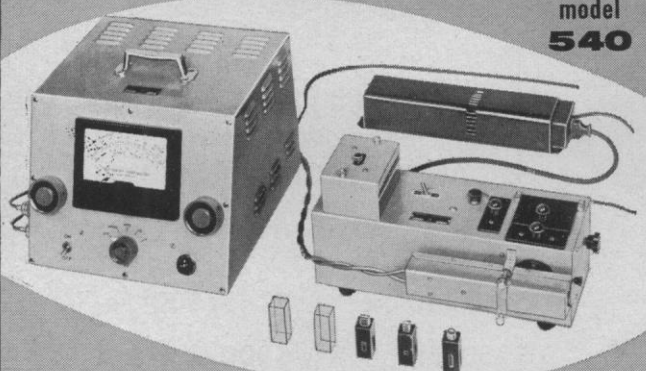
**WRITE FOR  
CATALOG  
G76S/11171**



## PHOTOVOLT

### LINE-OPERATED MULTIPLIER FLUORESCENCE METER

model  
**540**



- High sensitivity . . . full scale for 0.001 microgram quinine sulphate
- Micro-fluorimetry . . . liquid volumes down to 1 ml
- Low blank readings . . . linear instrument response
- High sensitivity nephelometry . . . minute turbidities
- Fluorescence evaluation of powders, pastes, and solids; also for spot-tests on filter paper without elution
- Selection of filters, interference filters, and sample holders

Write for Bulletin No. 392 to:

## PHOTOVOLT CORP.

1115 Broadway • New York 10, N. Y.

Also: pH Meters, Colorimeters, Densitometers

# NO lost experiments with

## MICROSCOPIC SLIDE LABELING



Eliminate guesswork . . . greasemark mistakes. Get positive identification. Simply pull tab and a fresh, clean label "pops" out. Fast, self-sticking labels dispensed one at a time. Available in standard or "tissue-high" thickness. They accept pen, pencil, ball point pen or typewriter marking. 1000 labels per carton.



Write for detailed information and the name of your nearest TIME distributor.

**PROFESSIONAL TAPE CO., INC.**  
360 Burlington Ave. • Riverside, Ill.

# SCIENCES in Communist China

## CONTENTS

- SCIENCE AND SOCIETY.  
4 chapters
- BIOLOGICAL AND MEDICAL  
SCIENCES. 7 chapters
- ATMOSPHERIC AND EARTH  
SCIENCES. 4 chapters
- MATHEMATICS AND THE  
PHYSICAL SCIENCES.  
5 chapters
- ENGINEERING SCIENCES  
AND ELECTRONICS.  
6 chapters

\* If you are not a member of the AAAS, you may join now, and order this volume at the special member price. Enclose \$8.50 dues for your first year of membership, along with payment for the volume.

This new AAAS symposium volume represents a systematic effort on the part of American scientists, many of them of Chinese origin, to give a clear, unified account of material gleaned from about 250,000 pages of scientific journals and books published in Continental China.

Until now, information about science and scientific development under Communist control has not been available to Western scientists because of the language barrier, and because so few copies of relevant books and journals have been available.

This volume presents a heretofore unavailable opportunity to assess a decade of science in Communist China.

**Price: \$14.00\* (\$12, prepaid, for AAAS members)**

Individual membership in the AAAS offers many benefits in addition to savings on AAAS volumes. It includes *Science*, and the quarterly **AAAS Bulletin**.

**Order today from**

**American Association for the Advancement of Science**

1515 Massachusetts Avenue, NW

Washington 5, D.C.

contributions of electron microscopy in many areas of science. The organizing committee co-chairmen are T. F. Anderson and J. H. Reisner; S. S. Breese, Jr., is program chairman. Limited funds will be available to assist enrolled students of electron microscopy in the United States in attending the congress. Requests for information should be addressed to Fifth International Congress for Electron Microscopy, 7701 Burholme Ave., Philadelphia 11, Pa.

A. R. TAYLOR

*Parke, Davis and Company,  
Detroit, Michigan*

## Forthcoming Events

### November

29-1. Communication Wires and Cables, symp., Asbury Park, N.J. (H. Kingsley, U.S. Army Research and Development Laboratory, Fort Monmouth, N.J.)

29-1. Western Surgical Assoc., San Francisco, Calif. (W. W. Carroll, 700 N. Michigan Ave., Chicago 11, Ill.)

30. American Geographical Soc., New York, N.Y. (C. W. Bastable, Columbia Univ., New York 27)

30-1. Conference on Graduate Medical Education, Philadelphia, Pa. (P. Nemir, Jr., Dean, Graduate School of Medicine, Univ. of Pennsylvania, Philadelphia)

30-1. Vehicular Communications, Minneapolis, Minn. (J. Kahnke, Minneapolis-Honeywell, Aero Div., 1541 Edgewater Ave., St. Paul 13, Minn.)

### December

1. Symposium on Insulin, New York Diabetes Assoc., New York, N.Y. (New York Diabetes Assoc., 104 E. 40 St., New York 16)

1-2. Linguistic Circle of New York, 7th annual conf., New York, N.Y. (L. Urdang, Random House, Inc., 501 Madison Ave., New York 22)

2. International College of Surgeons, intern. executive council, Chicago, Ill. (H. E. Turner, 1516 Lake Shore Dr., Chicago)

2. New York State Registry of Medical Technologists, annual seminar, New York, N.Y. (S. H. Keeling, 1719 Midland Ave., Syracuse, N.Y.)

2-7. American Acad. of Dermatology and Syphilology, annual, Chicago, Ill. (R. R. Kierland, Mayo Clinic, Rochester, Minn.)

3-6. American Inst. of Chemical Engineers, New York, N.Y. (F. J. Van Antwerpen, AICE, 345 E. 47 St., New York 17)

4-6. Institute of the Aerospace Sciences, Aerospace Support and Operations, natl., Orlando, Fla. (R. J. Kotowski, 318 Virginia Dr., Melbourne, Fla.)

4-8. International Colloquium on Ionic Bombardment, Bellevue, France. (Natl. Scientific Research Center, 15 Quai Anatole France, Paris 7<sup>e</sup>, France)

4-9. Mathematics Instruction at Secondary and University Levels, Inter-American conf., Bogota, Colombia. (M. Alonso, Div. of Science Development, Pan American Union, Washington 6)

4-9. World Federation of Neurology, Problem Commission of Tropical Neurology, Buenos Aires, Argentina. (P. Bailey, Natl. Inst. of Neurological Diseases and Blindness, Bethesda, Md.)

4-16. Inter-American Conf. on Education and Economic and Social Development, Santiago, Chile. (U.S. National Commission for UNESCO, Dept. of State, Washington 25)

4-16. Latin American Phytotechnical Meeting, 5th, Buenos Aires, Argentina. (U. C. Garcia, Organizing Committee, Rivadavia 1439, Buenos Aires)

5-7. Building Research Inst., Washington, D.C. (Scientific Liaison Office, Natl. Research Council, Sussex Dr., Ottawa, Canada)

5-8. United States and Japan Atomic Industrial Forums on Nuclear Power, 2nd conf., Tokyo, Japan. (C. Robbins, Executive Manager, Atomic Industrial Forum, 3 E. 54 St., New York 22)

6-7. UNESCO Intern. Non-Governmental Organizations on Extension of Intern. Collaboration in Education, Science and Culture to Africa, Paris France. (Place de Fontenoy, Paris 7<sup>e</sup>)

6-8. Conference on Document Copying by Photography, London, England. (A. J. O. Axford, Ozalid Co., Longston Rd., Loughton, Essex, England)

6-8. Electrical Furnace Steel Conf., 19th, American Inst. of Mining, Metallurgical and Petroleum Engineers, Pittsburgh, Pa. (Scientific Liaison Office, Natl. Research Council, Sussex Dr., Ottawa, Canada)

6-8. Latin-American Congr. of Pathological Anatomy, 3rd, Medellin, Colombia. (A. C. Henao, Laboratorio de Anatomía Patológica, Rua Botucatu 720, São Paulo, Brazil)

6-8. National Institutes of Health Symp. on Neuroendocrinology, Miami, Fla. (A. V. Nabbandov, 102 Animal Genetics, Univ. of Illinois, Urbana)

6-12. American Acad. of Optometry, Chicago, Ill. (C. C. Koch, 1506-08 Foshy Tower, Minneapolis 2, Minn.)

6-16. Food and Agriculture Organization of the U.N. World Health Organization, Nutrition Conf. for the Far East, 5th, Hyderabad, India. (Intern. Agency Liaison Branch, Office of Director General, FAO, Viale delle Terme di Caracalla, Rome, Italy)

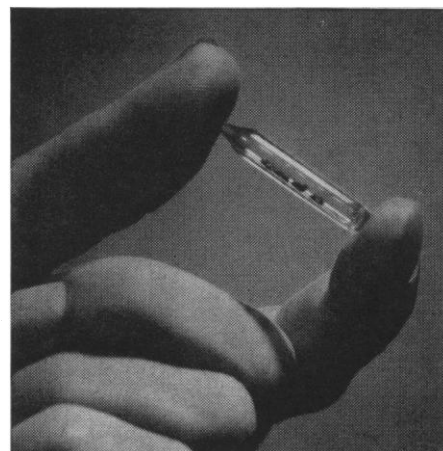
6-16. Food and Agriculture Organization of the U.N., Far East Meeting on Animal Production and Health, 3rd, Bangkok, Thailand. (Intern. Agency Liaison Branch, Office of Director General, FAO, Viale delle Terme di Caracalla, Rome, Italy)

7-8. Symposium on Sintered High-Temperature Oxidation-Resistant Materials, London, England. (S. C. Guilan, Powder Metallurgy Joint Group, Inst. of Metals, 17 Belgrave Sq., London)

7-9. American Chemical Soc. Southwest-Southeast regional meeting, New Orleans, La. (P. D. Accardo, California Chemical Co., Oronite Div., Belle Chasse, La.)

# ISOTOPES

## for Your Development Work



**Technetium-99:** A useful research tool for corrosion inhibitor studies and preparation of special alloys. Oak Ridge National Laboratory also offers more than 300 radioactive and stable isotope products.

### RADIOISOTOPES

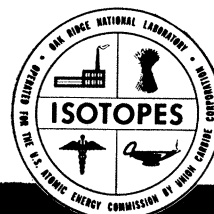
**Processed Solutions**—90 processed radioisotopes may be obtained, including many carrier-free and high specific activity products.

**Now Available**—Scandium-46 at \$0.20 per millicurie; I-131 at \$0.40 per mc.; technetium (as element or ammonium pertechnetate) \$100 a gram; calcium-47, with less than 5% Ca-45, \$200 per mc.

### STABLE ISOTOPES

More than 200 stable isotopes available from 50 elements.... Chemical processing and target fabrication services also offered.... Ultra-high isotopic purity in a number of isotopes.

For a catalog or information concerning your special isotope requirements, write to: Isotopes Division, Oak Ridge National Laboratory, P. O. Box X, Oak Ridge, Tennessee.



**OAK RIDGE  
NATIONAL LABORATORY**

Operated by  
**UNION CARBIDE CORPORATION**  
for the  
**U.S. ATOMIC ENERGY COMMISSION**



7-9. New York Acad. of Sciences Conf. on the Cervix, New York, N.Y. (W. R. Lang, Jefferson Medical College, Philadelphia, Pa.)

7-9. Texas Acad. of Science, Galveston. (D. E. Edmondson, Mathematics Dept., 115 Bendect Hall, Univ. of Texas, Austin 12)

8. Food and Agriculture Organization of the U.N., Advisory Group on Training in Home Economics and Social Work, Rome, Italy. (Intern. Agency Liaison Branch, Office of Director General, FAO, Viale delle Terme di Caracalla, Rome)

8-9. American Rheumatism Assoc., interim session, Washington, D.C. (F. E. Demartini, 622 W. 168 St., New York 32)

8-9. Association for Research in Nervous and Mental Diseases, annual, New York, N.Y. (Scientific Liaison Office, Natl. Research Council, Sussex Dr., Ottawa, Canada)

8-9. Symposium on Plasma Membrane, New York, N.Y. (A. P. Fishman, New York Heart Assoc., 10 Columbus Circle, New York 19)

8-10. American Psychoanalytic Assoc., New York, N.Y. (D. Beres, 151 Central Park W., New York 23)

9-10. Academy of Psychoanalysis, New York, N.Y. (J. H. Merin, 125 E. 65 St., New York 21)

10-13. American Phytopathological Soc., Biloxi, Miss. (G. A. Zentmyer, Dept. of

Plant Pathology, Univ. of California, Riverside)

10-14. Psychosomatic Medicine Symp., 6th, Philadelphia, Pa. (Miss M. R. Carmosin, Hahnemann Medical College and Hospital, 235 N. 15 St., Philadelphia 2, Pa.)

10-17. Latin American Congr. on Microbiology, 2nd, San José, Costa Rica. (J. L. De Abate, Secretary General, Apartado 1404, San José)

11. Society of Photographic Scientists and Engineers, Washington, D.C. (C. M. Bailey, Rte. 4, Box 404, Fairfax, Va.)

11-15. Agricultural and Public Health Aspects of Radioactive Contamination in Normal and Emergency Situations, technical seminar, The Hague, Netherlands. (Food and Agriculture Organization of the U.N., Intern. Agency Liaison Branch, Office of the Director General, Viale delle Terme di Caracalla, Rome, Italy)

11-15. Symposium on Organization of Agricultural Research, Muguga, Kenya. (Commission for Technical Cooperation in Africa South of the Sahara, Pvt. Mail Bag 2359, Lagos, Nigeria)

11-16. Ionospheric Soundings in the Intern. Geophysical Year/Intern. Geophysical Cooperation-1959 Symp., Nice, France. (A. H. Shapley, URSI World-Wide Soundings Commission, Central Radio Propagation Laboratory, Natl. Bureau of Standards, Boulder, Colo.)

12-14. Association for Computing Machinery, eastern joint computer conf., Washington, D.C. (B. Oldfield, I.B.M. Corp., 326 E. Montgomery, Rockville, Md.)

12-15. American Soc. of Agricultural Engineers, Chicago, Ill. (J. L. Butt, ASAE, 420 Main St., St. Joseph, Mich.)

13. American Acad. of Arts and Sciences, Brookline, Mass. (J. L. Oncley, 280 Newton St., Brookline 46)

15-16. Oklahoma Acad. of Science, Stillwater. (D. Buck, Northern Oklahoma Junior College, Tonkawa)

17-18. International Congr. of Comparative Pathology, 9th, Paris, France. (L. Grollet, Comité International Permanent des Congrès de Pathologie Comparée, 63 Avenue de Villiers, Paris 17°)

19-23. Inter-American Congr. of Psychology, 7th, Monterrey, Mexico. (G. M. Gilbert, Psychology Dept., Long Island Univ., Brooklyn 1, N.Y.)

22-29. Plant Tissue and Organ Culture, intern. symp., New Delhi, India. (P. Maheshwari, Univ. of Delhi, Delhi)

26-28. History of Science Soc., annual, Washington, D.C. (J. C. Greene, 1121 Iowa Ave., Ames, Iowa)

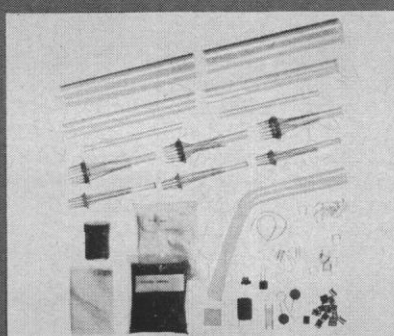
26-31. American Assoc. for the Advancement of Science, annual, Denver, Colo. (R. L. Taylor, AAAS, 1515 Massachusetts Ave., NW, Washington 5)

## SCIENCE TEACHING APPARATUS EXPENSIVE?

NOW WITH *Physikit*<sup>®</sup> YOU CAN

## MAKE YOUR OWN VACUUM TUBES FOR PENNIES!

Standard techniques for making high vacuum tubes ( $10^{-7}$  to  $10^{-8}$  mm Hg) involve prohibitive expenditures for equipment and highly skilled technicians. With MACALASTER BICKNELL's new High-Vacuum Technique and Physikit students can now make inexpensively their own cathode-ray tubes, diodes, triodes, phototubes, and even such specialized apparatus as a mass spectrometer, or a tube with which the time of flight of electrons or ions can be measured.



PHYSIKIT 1000 A includes all the necessary materials designed to make 4 Diodes, 4 Triodes, and 8 Cathode Ray Tubes. Only \$69.50.

Physikit, together with MACALASTER BICKNELL's new High Vacuum Technique, a method using activated charcoal,  $\text{CO}_2$ , a special gettering regime, and a vacuum gauge, enables the teaching of modern microphysics at a cost within your budget.

FOR MORE INFORMATION  
Return Coupon Below!

Your guarantee of quality apparatus — MACALASTER BICKNELL CORP. is the ONLY manufacturer and distributor of PSSC Physics Kits which are specifically approved and supervised by Educational Services, Inc.



Approved  
PSSC

Please send "Physikit" information.

Name \_\_\_\_\_

Subject Taught \_\_\_\_\_

School \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_

State \_\_\_\_\_ 7-11-41

**MACALASTER  
BICKNELL**

CORPORATION

SCIENCE EDUCATION DIVISION  
253 Norfolk Street, Cambridge, Mass.

The following 35 meetings are being held in conjunction with the AAAS annual meeting.

AAAS Southwestern and Rocky Mountain Div., Committee on Desert and Arid Zones Research (M. G. Anderson, University Biological Station, Pulston, Mich.). 26-31 Dec.

Alpha Epsilon Delta (M. L. Moore, 7 Brookside Circle, Bronxville, N.Y.). 28 Dec.