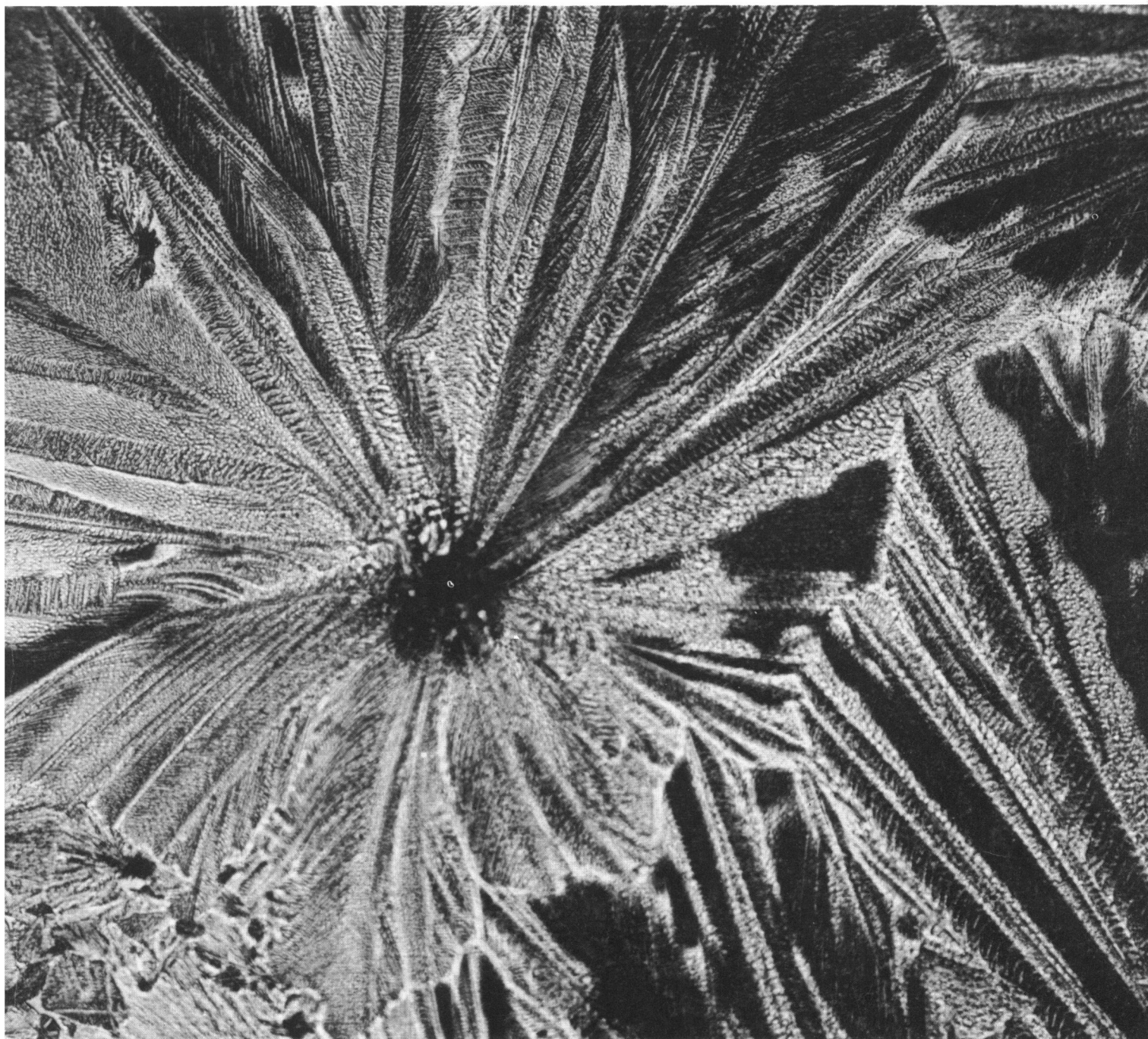


SCIENCE

17 February 1961

Vol. 133, No. 3451

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



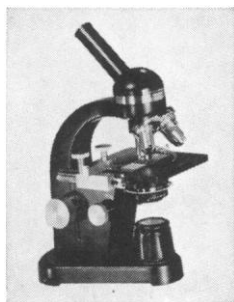
Proceedings Issue

LEITZ EXCLUSIVE: *the only quality microscope that combines these important features...*



BINOCULAR MEDICAL AND LABORATORY MICROSCOPE SM. Equipped with inclined binocular body; mechanical stage; two-lens condenser with swing-out upper element and iris diaphragm; quadruple nosepiece; mirror and fork. Optical outfit with achromats 3.5x, 10x, and 45x and 100x oil immersion with spring-loaded mounts plus 10x eyepieces.

MONOCULAR MEDICAL AND LABORATORY MICROSCOPE SM. Same as above, but equipped with inclined monocular tube. If desired, monocular microscope can be converted to a binocular unit in a simple one-step operation.



LEITZ TECHNICAL SERVICE is unique in the United States, providing one of the most extensive service and repair facilities in the field of scientific instruments.

- 1. Single-knob focusing** combines coarse and fine focusing for faster, more convenient operation...saves time...simplifies your microscope studies...lets you work in greater comfort and ease.
- 2. The world's finest optics**...high precision construction...the most exacting operation — all in a moderately priced instrument.
- 3. Accepts all standard slide sizes.** Mechanical stage accepts both 3" x 1" and 3" x 2" slides.
- 4. Retractable spring-load mounts** on high-powered objectives provide positive protection against damage to slide or front lens.
- 5. Anti-reflection coating** on tubes and optics throughout.
- 6. Extra-wide objective magnification range 45-1250x.**
- 7. Monocular or binocular body rotatable 360°** with one-step locking at any point.
- 8. Variety of mechanical stages** available.
- 9. Selection of attachable illuminators,** interchangeable with mirror.
- 10. Wide-field or high-eyepoint eyepieces** (for wearers of glasses) available at slight extra cost.
- 11. Contour-fitted carrying case** protects microscope.

GET ALL THE FACTS...WRITE FOR LITERATURE... for full information on all the important new features and conveniences built into the latest SM microscope.

FILL OUT COUPON...MAIL TODAY!

E. LEITZ, INC.

Dept: SC-217

468 Park Avenue South, New York 16, New York

Gentlemen: Please send me complete information on the:

- ☐ Model SM microscope.
☐ Kindly have representative ☐ phone or ☐ write me for appointment to demonstrate SM microscope at no obligation to me.

Name

Address

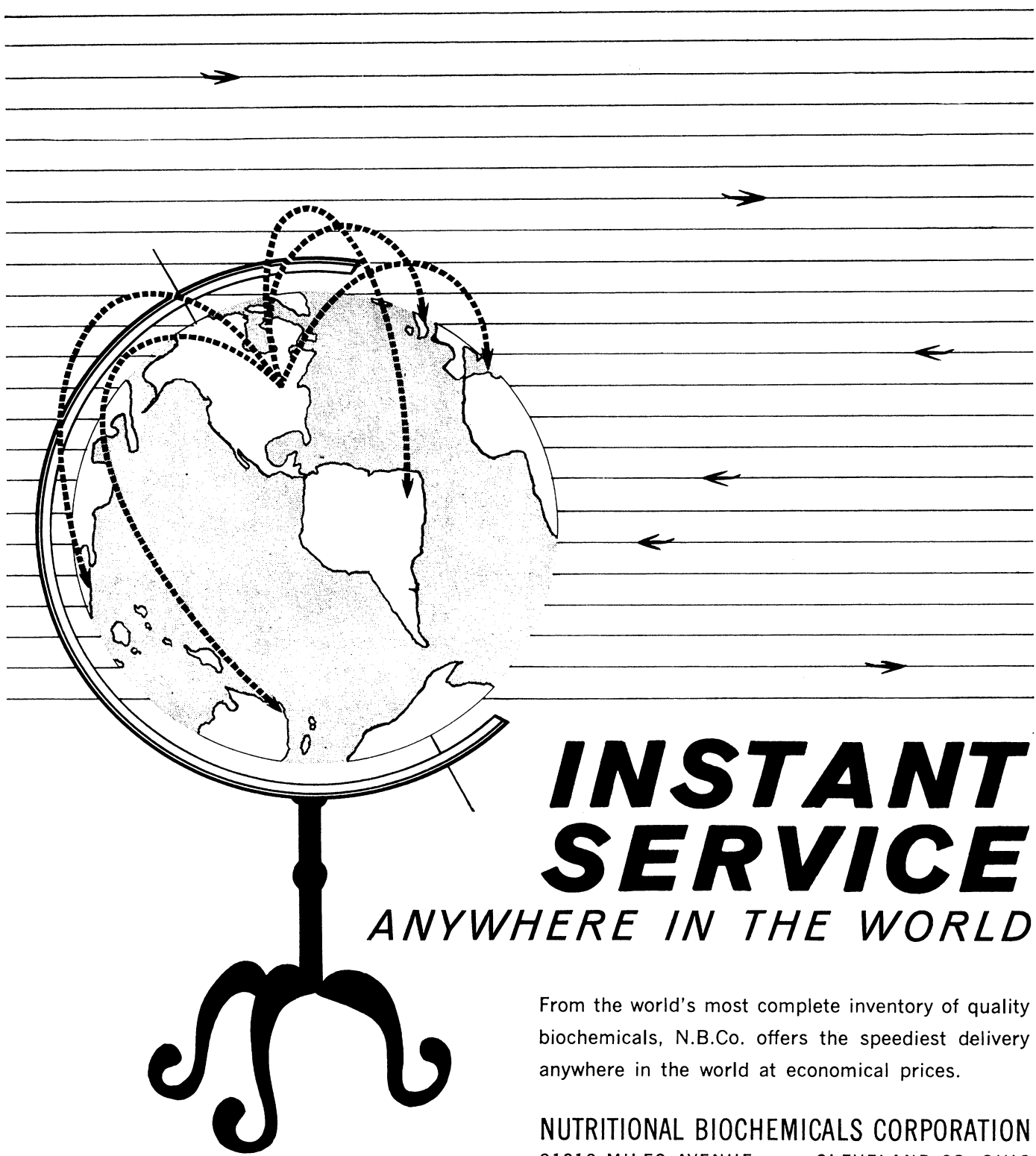
City Zone State

Telephone

37761

Leitz

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



INSTANT SERVICE

ANYWHERE IN THE WORLD

From the world's most complete inventory of quality biochemicals, N.B.Co. offers the speediest delivery anywhere in the world at economical prices.

NUTRITIONAL BIOCHEMICALS CORPORATION
21010 MILES AVENUE CLEVELAND 28, OHIO

Send for our free October, 1960
Catalog containing more than 2600
items. Fill out coupon and mail to-
day for your copy.



Name
Organization
City
State Zone

*In the Laboratory . . . where optical quality counts
 . . . the trend is to **UNITRON** Microscopes*

**FREE
10 DAY TRIAL
ON ANY
UNITRON**

- POLARIZING MICROSCOPE**
MPS \$269
- BINOCULAR PHASE CONTRAST**
BMPE \$490
- BINOCULAR PHASE-CAMERA-MICROSCOPE**
BU-13 \$1580
- Polaroid Land Camera Attachment**
\$115
- STUDENT AUTO-ILLUMINATION MICROSCOPE**
MSA \$107
- STEREOSCOPIC MICROSCOPE**
MSHL \$267
- MICROSCOPE LAMP**
LS \$14.75
- LABORATORY MICROSCOPE**
MLK \$198
- Photomicrography Set**
ACA \$39.95
- Attachable Graduated Stage**
GR \$31.50
- BINOCULAR AUTO-ILLUMINATION**
BMLU \$425
- BINOCULAR INVERTED**
BMIC \$609

UNITRON offers an extensive line of Laboratory Microscopes & Accessories for Research, Industry and Education. Illustrated is a partial selection for biology, medicine, chemistry and related fields. UNITRON also has companion instruments for the metalworking industries.

Noted for optical quality . . . advanced optical and mechanical design . . . unique and convenient operational features . . . long wearing construction . . . attractive budget prices which include basic optics . . . these, together with years of proven instrument performance, are the reasons why . . .

THE TREND IS TO UNITRON!

UNITRON

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

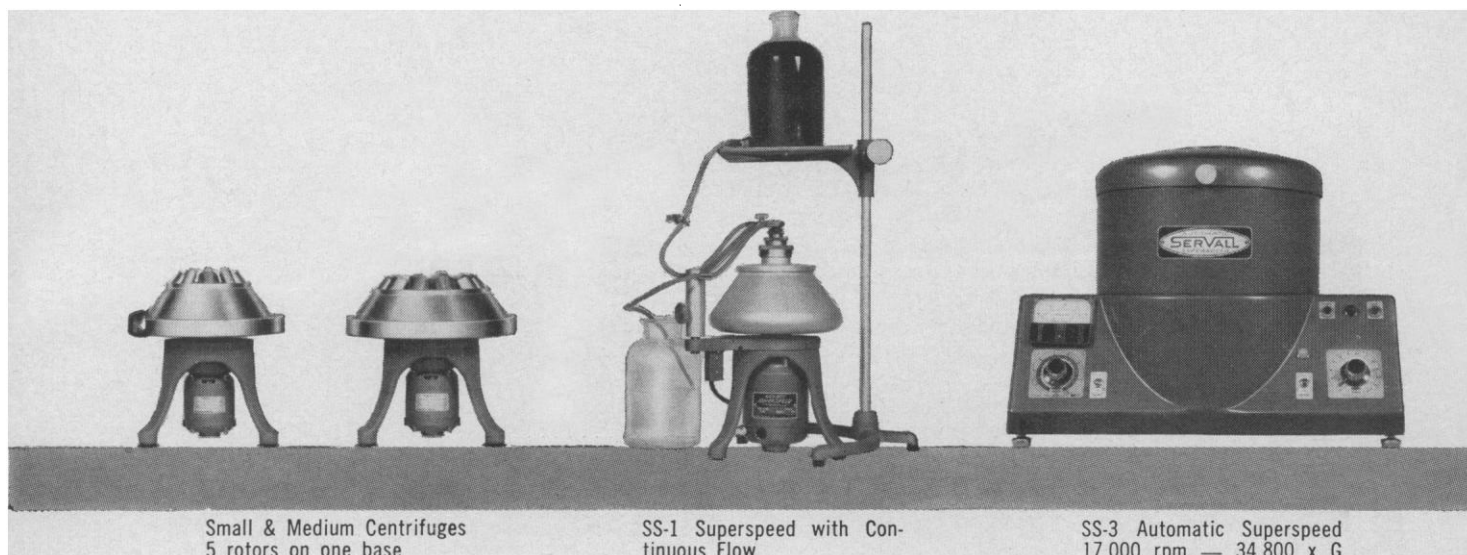
Please rush UNITRON's Microscope Catalog 4-L-3

Name _____
 Company _____
 Address _____
 City _____ State _____

Editorial	A Question of Degrees	441
Articles	Electromagnetic Radiation as a Tool in the Life Sciences: <i>T. Jaski</i> and <i>C. Süsskind</i> .. Radio waves, long used for communications, are becoming an important tool in biophysics research.	443
Science In the News	The Missile Gap; Overhead for Federal Research Grants; Aid to Education and Civil Rights	448
Book Reviews	M. B. Arnold's <i>Emotion and Personality</i> , reviewed by <i>W. C. Halstead</i> ; other reviews ..	455
Reports	Effect of Electrostatic Field on Freezing of Supercooled Water and Insects: <i>R. W. Salt</i>	458
	Lipids of <i>Ankistrodesmus braunii</i> : <i>V. R. Williams</i> and <i>R. McMillan</i>	459
	Appearance of a Spring Maximum in Nuclear Test Debris in 1960: <i>P. F. Gustafson, S. S. Brar, M. A. Kerrigan</i>	460
	Latitudinal Effect in the Transfer of Radiocarbon from Stratosphere to Troposphere: <i>H. Tauber</i>	461
	Growth Inhibition of Insects and a Fungus by Indole-3-Acetonitrile: <i>E. E. Smissman, S. D. Beck, M. R. Boots</i>	462
Association Affairs	Paul M. Gross, President-Elect: <i>P. Handler</i>	463
	AAAS Council Meeting, 1960: <i>D. Wolffe</i>	465
	AAAS Officers, Committees, and Representatives for 1961	468
	A Report of the Eighth New York Meeting: <i>R. L. Taylor</i>	472
	Public Information Service: <i>S. S. Negus</i>	480
	Reports of Sections and Societies	482
Departments	Forthcoming Events; New Products	528
Cover	Salicylic acid crystals ($\times 880$). [L. C. Massopust, Marquette University School of Medicine]	

right across the board...

SERVALL[®] CENTRIFUGES



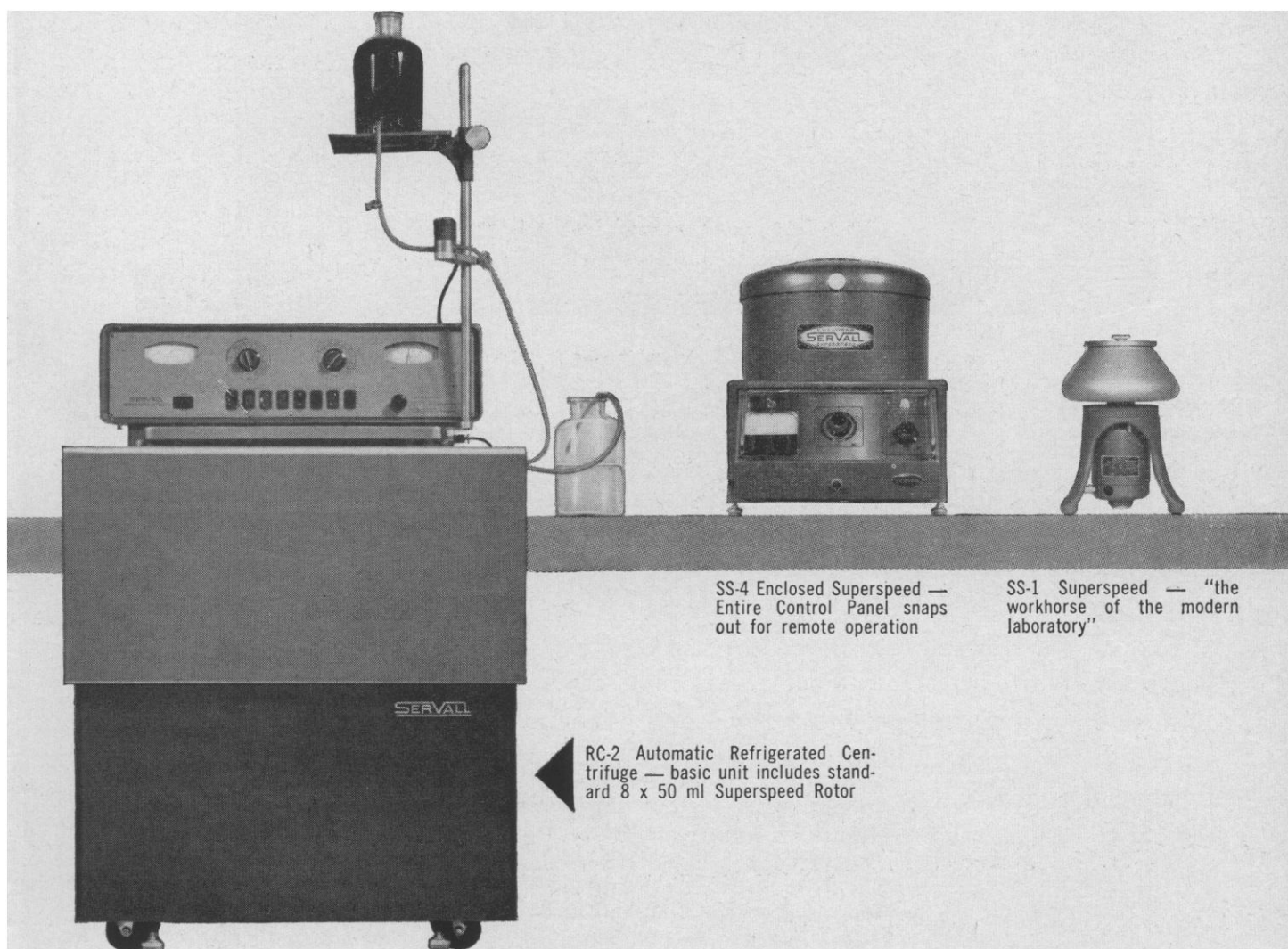
From the SERVALL Small and Medium Centrifuges that offer five different rotors on one basic motor assembly plus a huge variety of tube combinations, to the RC-2, the latest in Refrigerated Centrifugation, SERVALL Centrifuges Serve You Best.

The SERVALL SS-1 Superspeed, SS-3 Automatic Superspeed, SS-4 Enclosed Superspeed and RC-2 Automatic Refrigerated Superspeed Centrifuges, all designed to accept the unique SERVALL 8 to 2 Tube Direct Sedimentation Continuous Flow System, lead the field in a *functional versatility* that is determined by one thing: the modern researcher's requirements — *your* requirements.

Automation, special rotors such as particle counting and field-aligning, high centrifugal force, safety features, operational reliability and simplicity, whichever is *your* major concern SERVALL specifications cover it.

And remember, in the U.S. you get direct, personal service on all your needs from SERVALL-trained representatives. In Canada and elsewhere SERVALL Centrifuges and Instruments are available from specially appointed distributors.

SERVE YOU BEST!



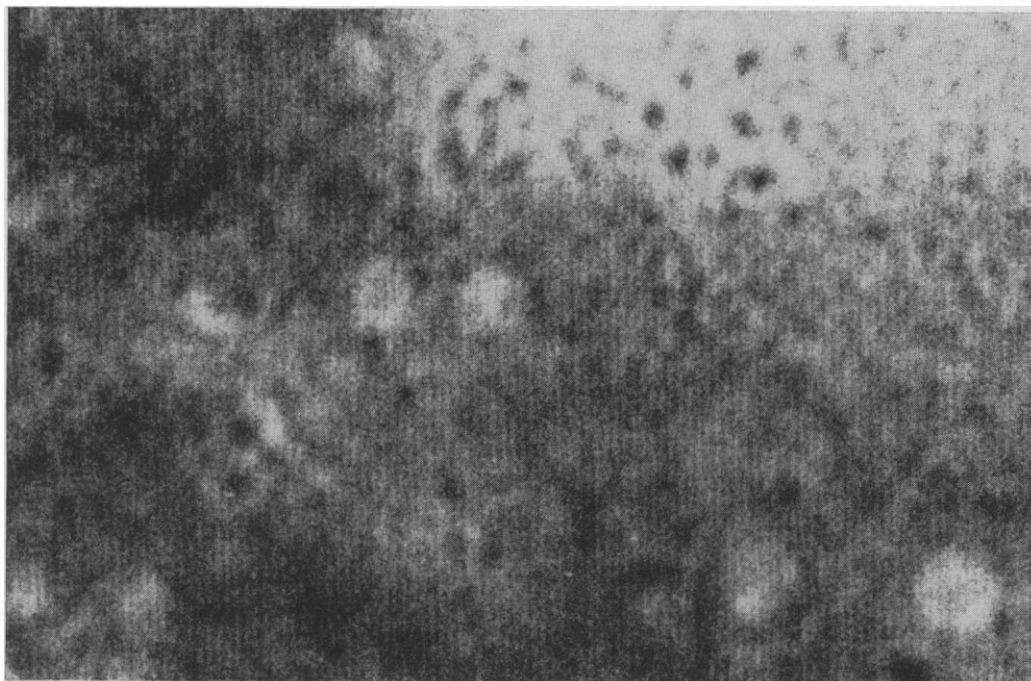
ILLUSTRATED LITERATURE UPON REQUEST FOR CATALOG SC-2GC—or circle number on reply card

Ivan Sorvall, Inc.

Norwalk, Connecticut

An independent company: not connected with any other centrifuge manufacturer. Established 1934.

EXPLORING FUNDAMENTALS ... with the HITACHI HU-11



Shown is a microphotograph of Potassium Chloro Platinite, taken with an Hitachi HU-11 Electron Microscope, 1,750,000 photographic magnification, and with a resolution of 6.99 Angstrom Units!

Hitachi's guaranteed 8–10 Angstrom Unit resolution allows you to probe the very basic structure of matter—making full use of the HU-11's 250,000 direct magnification.

The basic Hitachi HU-11, without accessories, serves as a highly efficient electron diffraction apparatus for use with opaque or transparent specimens. With such accessories as a low temperature stage, a high temperature stage, a reflection microscopy attachment and a X-Ray shadow camera, the Hitachi HU-11 allows investigations into every field of research.

**LEASE TERMS ARE
NOW AVAILABLE**

You are cordially invited to visit our new Eastern sales office and laboratory facility, located at 5927 Riverdale Avenue, New York 71, N.Y.

ERB & GRAY SCIENTIFIC, Inc.

Exclusive Hitachi distributors for the United States

854 S. Figueroa St., Los Angeles 17, Calif.



5927 Riverdale Ave., New York 71, N.Y.



STERIL-AQUA®...THE NEW, EASY WAY TO DISTILL PURER WATER DIRECT FROM BOILER STEAM

Product of "CES" research, the Castle Steril-Aqua system converts raw boiler steam into pure, pyrogen-free water that meets or exceeds all USP standards—up to 600,000 ohms, as opposed to the conventional still range of 250,000-350,000 ohms specific resistance.

You pay less per gallon of distillate. You use about 20% as much space. You eliminate the need for secondary heating. Maintenance is

reduced from once a month to only twice a year because there are no heating coils to invite scale build-up. And you save by getting the right size for your specific needs—from 5 to 500 gallons per hour.

Whatever your problems in water distillation or sterilization, look to CES, the Castle Engineered Sterilization program.

WRITE today for literature. There's no obligation for Castle initial research and planning.



Castle LIGHTS AND STERILIZERS
WILMOT CASTLE CO., 1713-15 E. HENRIETTA RD., ROCHESTER 18, N. Y.

NEW BECKMAN DB SPECTROPHOTOMETER



CUTS 80% OFF ANALYSES TIME!

The Beckman DB Spectrophotometer utilizes an exclusive double-beam system. This eliminates most adjustments required in single-beam units. Separate readings for reference and sample cells are unnecessary—you simply set the desired wavelength, insert the sample and reference and read the meter. Manual operation, wide wavelength range and direct readout combine with double-beam ac-

tion to bring you up to 80% savings in routine analyses time.

No. 68435—Beckman Model DB Spectrophotometer, for 320 to 770 mμ wavelength range, with two silica rectangular cells. 115 volts, 50/60 cycle.....\$1,700.00

To extend range to 220 mμ the following are needed:

No. 68437A—UV Accessory Set.....\$40.00
No. 68437B—Hydrogen Lamp Power Supply.....\$297.00

Flame Attachment also available for use with Model DB.



New Push-button Recorder

Ratio Recording Available

Add a wavelength drive accessory and a Beckman Potentiometric Recorder to the Model DB and you have the lowest-priced true %T recording spectrophotometer available today! Features of the Beckman Potentiometric Strip Chart Recorder make it the ideal companion for the Model DB.

No. 67940—Beckman Potentiometric Recorder.....\$475.00
No. 68438A—Wavelength Drive Accessory.....\$75.00



Ask your S/P Representative for complete specifications, or write ...

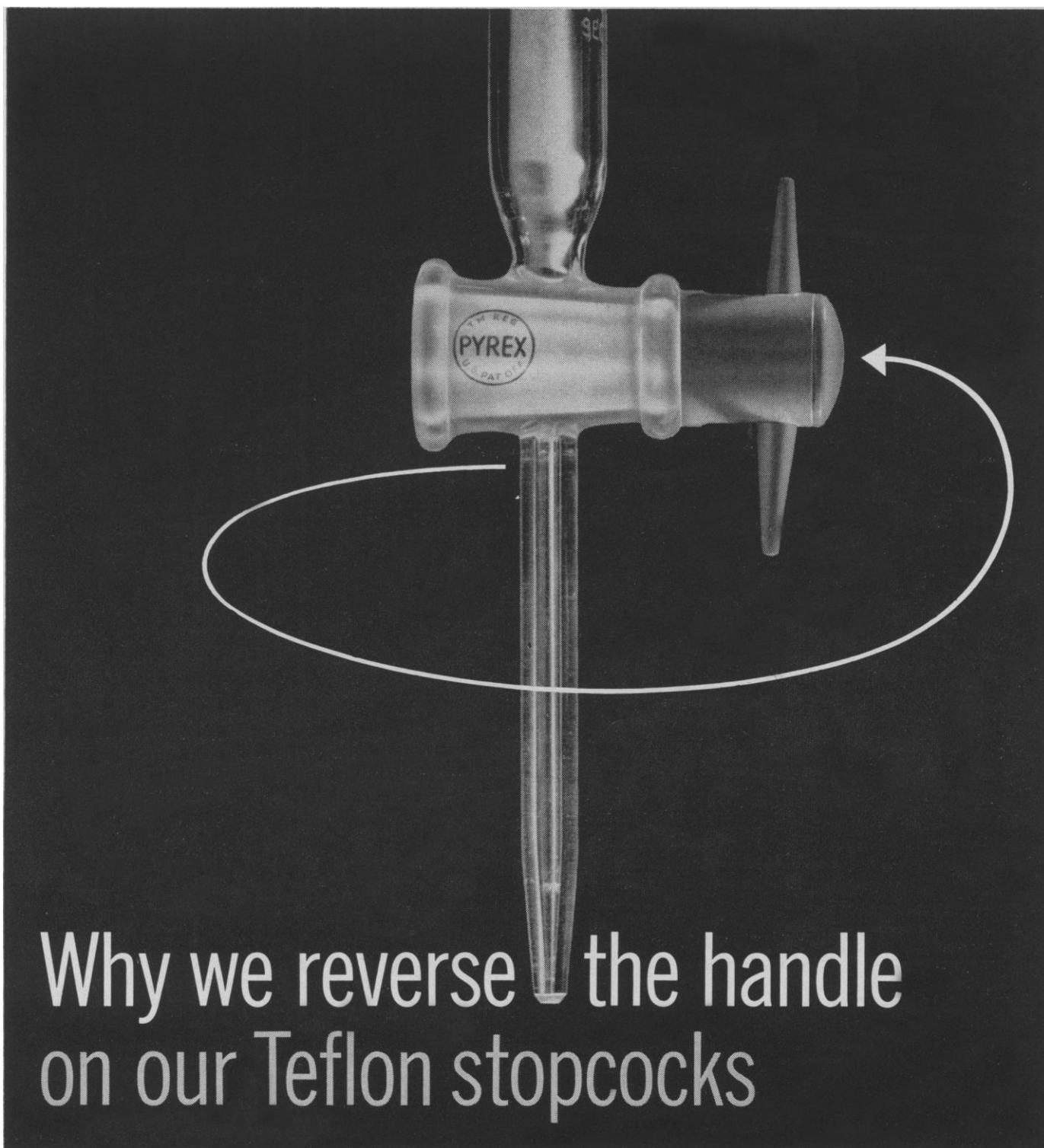
Scientific Products

DIVISION OF AMERICAN HOSPITAL SUPPLY CORPORATION

GENERAL OFFICES: 1210 LEON PLACE, EVANSTON, ILLINOIS

Regional Offices: Atlanta • Boston • Chicago • Columbus • Dallas • Kansas City
Los Angeles • Miami • Minneapolis • New York • San Francisco • Washington

Export Department—Flushing 58, L. I., New York. In Canada: Canadian Laboratory Supplies Limited.
In Mexico: Hoffmann-Pinther & Bosworth, S. A.



Why we reverse the handle on our Teflon stopcocks

When we decided to add the advantages of Teflon to our PYREX® stopcocks,* we found we could free you from a number of the traditional stopcock nuisances simply by putting the handle on the small end of the tapered plug.

There is no nut to tighten or strip. The spring mechanism which holds the plug to a firm seal is *inside* the handle. This method protects the works from any outside deterrents.

Since the plug itself is Teflon,† you

can work with alkalis or acids without worry of freezing the plug in place.

The handle removes easily so that you can take out the plug for cleaning or replacement in a matter of seconds.

You can order this new stopcock by itself in 2 mm or 4 mm sizes under catalog No. 7281. No. 6401 Squibb funnels are already equipped with both sizes. No. 2102 burets have the 2 mm stopcock attached.

Ask your dealer to show you this

ware. Or check the new PYREX Laboratory Catalog, LG-2. If you don't already have a copy of the world's most complete listing of laboratory glassware, please write and we'll send you one.

*U. S. Pat. 2876985

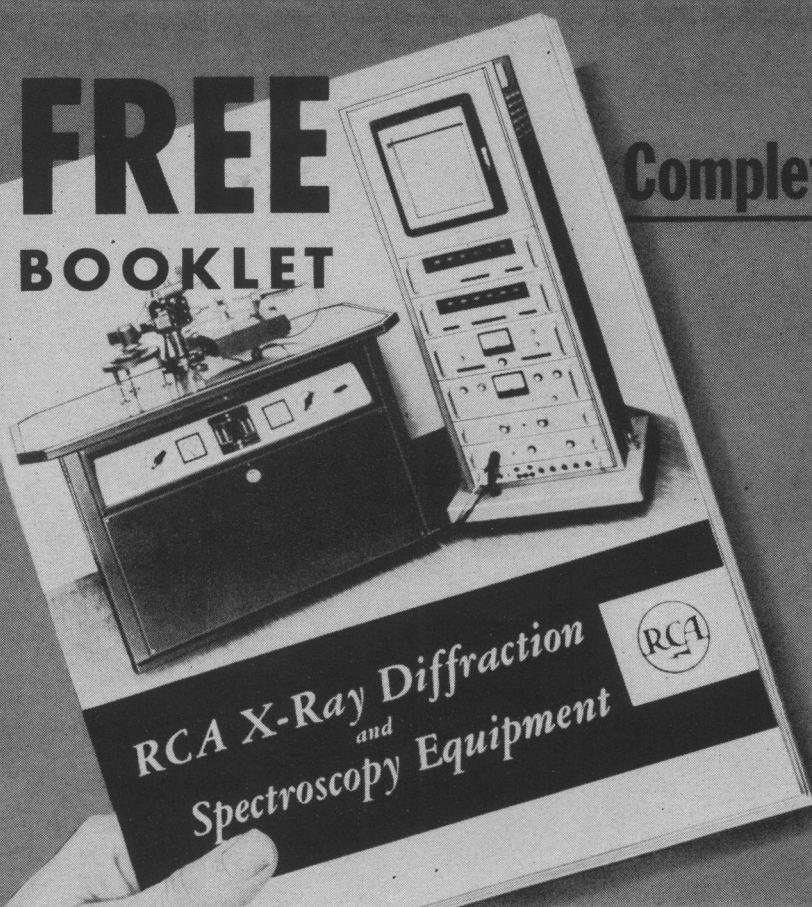
†Du Pont Trademark



CORNING GLASS WORKS
7502 Crystal Street, Corning New York
CORNING MEANS RESEARCH IN GLASS

PYREX® laboratory ware... the tested tool of modern research

FREE BOOKLET



Complete Instrumentation for X-Ray Diffraction and Spectroscopy Laboratories

For all who are planning to establish new facilities or expand existing ones—here is a new comprehensive brochure which shows why RCA X-Ray Diffraction and Spectroscopy equipment deserves your full consideration.

These precision-engineered instruments, outstanding for their technical excellence and performance characteristics, provide unusual versatility for a broad range of X-ray diffraction and spectroscopy studies. An excellent example is the inexpensive RCA kit which permits switching from diffraction to spectroscopy in less than 15 minutes. Fully described in the brochure are:

Console Model Generator—Crystalloflex IV—incorporates constant potential DC power supply plus many other advanced features. An easy-access electronic circuit panel is available for use with this unit.

Compact Low-Priced Table Model Generator—Crystalloflex II—an excellent tool for research projects entailing a high volume and wide variety of film work. Can be operated with up to four individually timed cameras simultaneously.

An unusually complete line of attachments and accessories for X-ray diffraction and spectroscopy, including a versatile group of cameras, a pole figure goniometer, single crystal layer line and micro-fluorescence attachments, vacuum spectrometer, and digital print-out device.

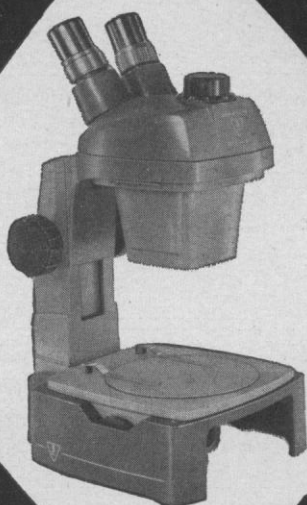
Contract services on RCA X-Ray Diffraction and Spectroscopy equipment and Electron Microscopes are available through eleven regional offices of the RCA Service Company. A NEW LEASING PLAN now makes it possible to obtain all scientific instruments with no down payment, low monthly terms and a favorable option to buy.

*For your free copy of this informative
Brochure or for a quotation on your
requirements, write to:*
Radio Corporation of America,
Dept. RC-362, Building 15-1, Camden, N.J.

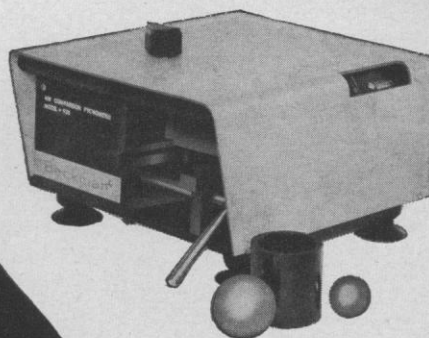


The Most Trusted Name in Electronics
RADIO CORPORATION OF AMERICA

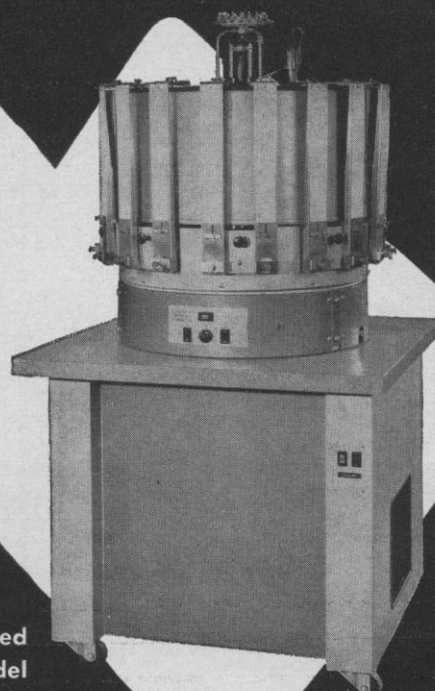
TOPS IN PERFORMANCE and CONVENIENCE



Model BVB-73



Model 930



Refrigerated
Model

Bausch & Lomb

Beckman

"Precision"

STEREOMICROSCOPES

Pictured is one of *twenty* different models in the "B&L" 3D Stereomicroscope line which features "StereoZoom" magnification plus a self-sufficient optical system known as the *Power Pod*. With this microscope, magnification is continuously variable—not in steps, but infinite within a wide range. You simply turn the "StereoZoom" magnification dial and watch the sharpest possible image zoom to the exact size you need. *For the entire "B&L" Stereomicroscope story, write for catalog D-15.*

M-5816-5X Model BVB-73 (illustrated)
0.7X thru 3X Variable Power Pod, total
magnification 7X thru 30X\$385.00

AIR COMPARISON PYCNOMETER

If you're looking for a simple way to obtain volume measurements for density and porosity determinations of irregular, powdered, and porous solids, then this is the instrument for you. It gives the answers in minutes—not hours. *Accuracy is better than 0.1 cc.* It's easy to operate, easily calibrated, features direct digital readout, and is completely portable. Model 930 requires no power...no liquids...no gas pressure determination...no temperature control. Applications are numerous. *For full information, ask for bulletin 786.*

P-9510X Model 930, including 50cc sample cup, two standard calibration balls, plus instruction manual\$545.00

WARBURG APPARATUS

Compact is the word for this new Warburg Apparatus. There are two models — standard and refrigerated. (Standard model is shown mounted on refrigeration unit.) Both are real space-savers. Manometers rotate a full 360° in either direction. Eighteen Warburg manometers or nine of the Summerson differential type may be used. The bath features a *built-in* cooling coil. A rotatable gassing manifold is available. Temperature uniformity is outstanding. *Bulletin 618, sent on request, gives details.*

C-5726 Refrigerated Model, 120 V, 60 Cycle, AC\$1,475.00

C-5725 Standard Model, 120 V, 60 Cycle, AC\$875.00

Note. Other electrical characteristics available

SCIENTIFIC
GLASS
APPARATUS
CO., INC.
BLOOMFIELD, NEW JERSEY



LABORATORY...
♦ APPARATUS
♦ INSTRUMENTS
♦ CHEMICALS
♦ GLASSWARE

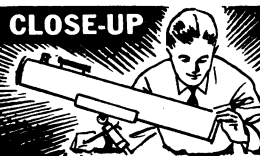
Branch Sales Offices: Albany 5, N. Y. • Boston 16, Mass. • Elk Grove Village, Ill. • Philadelphia 43, Pa. • Silver Spring, Md.
Branch Warehouse: Elk Grove Village, Ill.

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



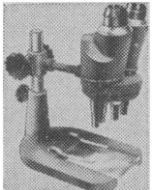
AMAZING SCIENCE BUYS

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, 3 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.

Low Power Supplementary Lens Attachment for above Stereo—provides 15X down to 6X with clear, extra large 1 1/2" field at 6X.
Stock No. 30,276-W\$7.50



Photographers! This is an actual photograph of the moon taken through our Astronomical Telescope by a 17-year 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 1/4" Reflecting Telescope—up to 255 Power, all-metal pedestal mount.
Stock No. 85,105-W\$79.50 F.O.B. Barrington, N.J.

NEW! GRAPH RUBBER STAMP

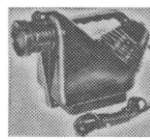


Real time and labor saver for math teachers. If your tests require graph backgrounds—no need to attach separate sheets of graph paper and worry about keeping them straight. Simply stamp a graph pattern, 3" square as needed on each paper. Grading graph problems then become 100% easier. Stamps are 3" square overall—2 different patterns.

Stock No. 50,255-W (100 blocks)\$3.00 Postpaid
Stock No. 50,351-W (16 blocks)\$3.00 Postpaid
Polar Coordinate Graph Stamp—3" Diam.
Stock No. 50,359-W\$3.00 Postpaid

Terrific Buy! American Made!

OPAQUE PROJECTOR



Projects illustrations up to 3" x 3 1/2" and enlarges them to 35" x 30" if screen is 6 1/2 ft. from projector; larger pictures if screen is further away. No film or negatives needed. Projects charts, diagrams, pictures, photos, lettering in full color or black-and-white. Operates on 115 volt, A.C. current. 6-ft. extension cord and plug included. Operates on 60 watt bulb, not included. Size 12" x 8" x 4 1/2" wide. Weight 1 lb., 2 oz. Plastic case with built-in handle.

Stock No. 70,189-W\$7.95 Postpaid

NEW! SCIENCE FAIR PROJECT KITS

Carefully planned to give any boy or girl the fun and excitement of discovering science facts. Can lead to awards or scholarships!

For Junior High School and beyond: MOLECULE AND CRYSTAL MODELS KIT—Rods and balls to make atomic models, plus directions.

Stock No. 30,413-W.....\$2.50 Postpaid

NUMBER SYSTEMS ABACUS—Makes a dramatic exhibit demonstrating number systems other than the decimal system.

Stock No. 70,334-W\$4.25 Postpaid

SOIL TESTING KIT—Basis for many fascinating experiments regarding growth of plants, etc.

Stock No. 60,118-W\$2.00 Postpaid

TOPOLOGY—All the ingredients for a project on 4-color map problems, Möbius strips, etc.

Stock No. 70,353-W\$6.00 Postpaid

CRYSTAL GROWING KIT—Grow breathtaking display of large crystals with this set.

Stock No. 70,336-W\$9.50 Postpaid

For Ages 8 thru Jr. High School: MAGNETISM KIT—Based on magnetism demonstrations developed by UNESCO.

Stock No. 70,325-W\$3.75 Postpaid

COLORS THROUGH POLARIZATION—Show the beautiful color effects produced by passing polarized light through transparent objects.

Stock No. 70,350-W\$2.00 Postpaid

OPTICAL ILLUSION KIT—Diagrams, lenses, mirrors, etc., for producing many amazing optical illusions.

Stock No. 70,352-W\$3.00 Postpaid

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\$2.75 Postpd.
Stock No. 30,350-W Cuff Links\$2.75 Postpd.
Stock No. 30,372-W Pendant\$2.75 Postpd.
Stock No. 30,390-W Tie-Clasp\$2.75 Postpd.

ANALOG COMPUTER KIT



Ideal introduction to the increasingly important electronic computer field. For bright students, or anyone interested in this new science. Demonstrates basic analog computing principles—can be used for multiplication, division, powers, roots, log operations, trig problems, physics formulas, electricity and magnetism problems. Easily assembled with screwdriver and pliers. Operates on 2 flashlight batteries. Electric meter and 3 potentiometers are mounted on die-cut box. Answer is indicated on dial. Computer is 20" long, 9" wide, 2" deep.

Stock No. 70,341-W\$14.95 Postpaid

FLASHLIGHT POINTER FOR MOVIE SCREENS

Ideal for pointing out interesting features on movie, 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\$9.50 Postpaid

SCIENCE TREASURE CHESTS

For Boys—Girls—Adults!

Excellent "Science Fair" Material!



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 HUMAN SKULL

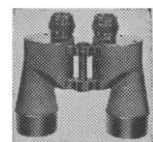


Invaluable educational aid! Fascinating conversation piece! Skull is anatomically correct—made of natural bone color, bone hard, lifetime plastic. Parts snap together—take apart. Spring-action lower jaw. Removable skull cap for examination of skull cavity, nasal passages, etc. Ideal for scientists, doctors, dentists, teachers, students, artists. Stand and Instruction and Anatomy Chart included.

Stock No. 70,294-W\$4.95 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 \$195. Our war surplus price saves you real money.



Stock No. 1533-WOnly \$55.00 Postpd.
(Tax included)

NOW! EXPLORE THE NEW LAND THEORY OF COLOR!



This entirely new method of color projection, demonstrated by Dr. Edwin Land of Polaroid, challenges all classic theories of color perception! Explore this new process—taking 2 black-and-white transparencies through differently colored filters, and projecting them with just 2 colors (usually red and white) for a full-color effect. Kit contains necessary filters for duplicating original experiments, plus many more for your own variations—also beam-splitter mirrors, parts for assembling a variable density filter, full directions and bibliography. Process works most easily with Polaroid Camera, but can be used with others.

Stock No. 50,366-W\$9.50 Postpaid

WRITE FOR FREE CATALOG "W"!

Optics for the Science Class! Optics for the Space Era!

144 PAGES! OVER

1000 OPTICAL BUYS!

Huge selection of lenses, prisms, war surplus optical instruments, parts and accessories. Telescopes, microscopes, binoculars, infrared sniperscope, etc. Low-cost Science and Math Learning and Teaching aids.

Request Catalog W.



WAR SURPLUS ELECTRIC GENERATOR



Brand new Signal Corps Electric Generator for scientific experiments, electrical uses, demonstrations. Generates up to 90 volts by turning crank. Use in high impedance relays. Charge ground and bring up night crawlers for bait or study. 2

Alnico Magnets alone worth original price. Wt. 2 lbs. Cost to Govt. \$15.

Stock No. 50,225-W\$4.95 Postpaid

Same type generator, mounted, with light, as electricity demonstrator.

Stock No. 50,365-W\$9.95 Postpaid

Take Telephoto Shots Thru 7 x 50 MONOCULAR

This is fine quality, American made instrument—war surplus! Actually 1/2 of U.S. Govt. 7 x 50 Binocular. Used for general observation both day and night and to take fascinating telephoto shots with your camera. Brand new \$95 value. Due to Japanese competition we close these out at a bargain price. Directions and mounting hints included.

Stock No. 50,003-W\$15.00 Postpaid

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

EDMUND SCIENTIFIC CO. BARRINGTON, NEW JERSEY

* patent pending



REQUIRES NO LUBRICATION

NEW QUICKSEAL^{*} **FREEZE-DRYING FLASKS**

- Maintain the same high vacuum, without grease, as standard flasks using lubricated ground glass surfaces.
- Eliminate the possibility of grease contaminating valuable samples.
- The bottom and top sections of Quickseal Freeze-drying Flasks have a smoothly beveled edge which slip fits into a double faced silicone rubber gasket. Entire set-up time is less than 10 seconds — less time than it takes to grease a standard ground glass flange.
- Lack of toxicity for sensitive biologicals plus excellent chemical and thermal stability are built-in qualities of silicone rubber.
- The cushioning effect of the soft rubber gasket appreciably reduces flask breakage.
- Quickseal Freeze-drying Flasks are available in volume capacities from 25 ml to 1,000 ml with either 19/38 or 24/40 top joint.

For full details and name of nearest distributor, write:
THE VIRTIS COMPANY, INC., GARDINER, NEW YORK

Available from the Williams & Wilkins Company

Anatomical Society of Great Britain and Ireland: **ELECTRON MICROSCOPY IN ANATOMY**

This monograph contains much valuable information on the subject of electron microscopy. The first eight chapters contain material on basic techniques; the last twelve chapters cover specific problems and structures in electron microscopy. This work represents the contributions of men from throughout the world who have done much of the fundamental research and methodology with these instruments.

1961 • 288 pp., illustrated • \$10.00

Hale: **THE INTERFERENCE MICROSCOPE IN BIOLOGICAL RESEARCH**

"The purpose of this book is to outline the background of the technique. It describes the basic phenomenon involved, the designs of instruments introduced, the theoretical basis of the measurement of mass, thickness and concentration of materials in very small objects, the use of the instruments which are commercially available and the errors and limitations of the method."—*From the Preface*

1958 • 132 pp., 96 figs. • \$5.00

Conn, Darrow & Emmel: **STAINING PROCEDURES USED BY THE BIOLOGICAL STAIN COMMISSION, 2nd edition**

"This publication is sponsored by the Biological Stain Commission and is intended to represent staining methods used in microtechnic in the laboratories of Commission members. It is not intended to be a complete treatise in regard to staining, nor even to include the only way of getting good results with the various methods here included. Nor are the procedures given intended to be considered as *standard* or *official*. They are all put in a standardized *form*, but only for the convenience of users."—*From the Preface*

1960 • 304 pp., paper covers, spiral bound • \$5.00

Gurr: **ENCYCLOPAEDIA OF MICROSCOPIC STAINS**

"This book is intended as a work of reference and a laboratory guide on the applications, structures, composition, molecular weights and properties of a very large number of dyes and other substances used for staining microscopic tissue preparations, etc.

"It is not claimed that every stain is dealt with here, but it is felt that very few of importance have been omitted."—*From the Preface*

1960 • 510 pp. • \$18.50

Weesner: **GENERAL ZOOLOGICAL MICROTÉCHNIQUES†**

"The present book is an expansion of [an] earlier syllabus, including the material which was originally presented in lectures or demonstrations. The text has been extended to include those procedures and problems most frequently encountered by more advanced students. . . ."—*From the Preface*

1960 • 241 pp., 25 figs., paper covers, spiral bound • \$5.25

Skerman: **A GUIDE TO THE IDENTIFICATION OF THE GENERA OF BACTERIA†**

"The Key to the Genera of Bacteria has been compiled with the aim of placing in the hands of research workers, teachers, and students, a volume in which general directives for the identification of bacteria are supported by a complete list of the techniques needed for the purpose. In addition, a Digest of data published for the various species in the seventh edition of *Bergey's Manual of Determinative Bacteriology* and in several original papers has been included. . . ."—*From the Preface*

1959 • 228 pp., paper covers • \$5.50

† Gladly sent to teachers for consideration as text.


THE WILLIAMS & WILKINS COMPANY
BALTIMORE 2, MARYLAND, U.S.A.

Picker **quality** nuclear training instruments at budget outlay



SCALER



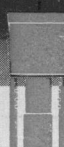
ANALYZER



RATEMETER



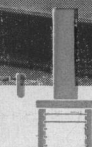
PROPORTIONAL
CONVERTER



WELL
COUNTER



FLOW
COUNTER



GEIGER TUBE

PICKER NUCLEAR TRAINING INSTRUMENTS permit scheduling full laboratory courses in radioisotope techniques.

These transistorized instruments are remarkably compact (as you can see above). They are good-looking, rugged, easy to understand, and simple to use. They have the versatility and capacity not only for basic nuclear training, but for handling advanced techniques like pulse height analysis and rate function studies.

Their cost falls well within the reach of modest equipment budgets, such as those supported by A.E.C. grants-in-aid in pursuance of its Nuclear Education Program.* For details, please call any local Picker office (see 'phone book) or write Picker X-Ray Corporation, 25 South Broadway, White Plains, New York.

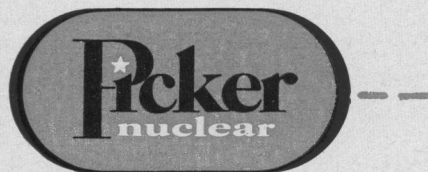


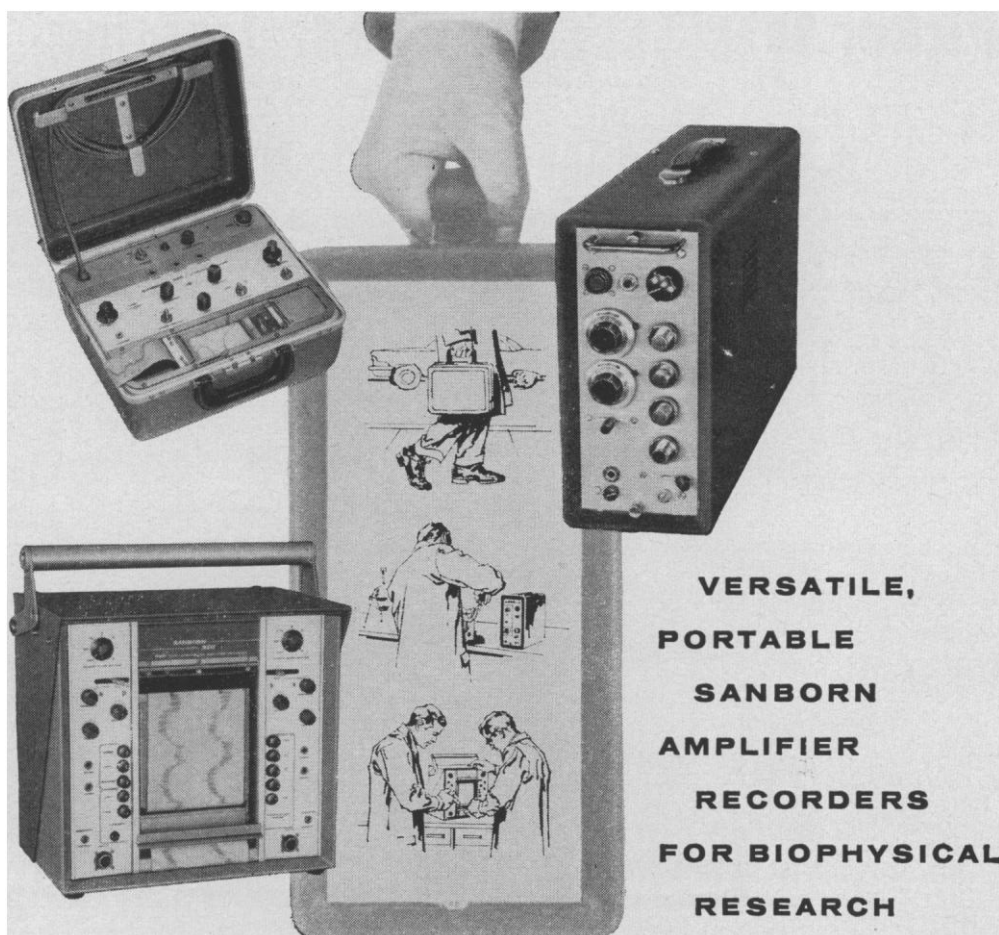
Standing behind every Picker instrument is a local member of the Picker X-Ray national sales and service network.

He's there to protect your investment.

Because of him the user of a Picker instrument is never left stranded.

** The Picker Nuclear Division is prepared to help interested institutions in drawing up training programs in the use of nuclear techniques in biology, chemistry, medicine, agriculture, physics, and other fields.*





Any one of these portable amplifier recorders will provide your laboratory with greater recording flexibility and operating economy. Select either a one or two channel model with electronics for either DC or carrier amplification, for such applications as routine recording from transducers . . . monitoring output of laboratory instruments such as Sanborn "450" portable amplifiers (self-contained units with built-in power supplies, available in DC Coupling, Carrier, ECG/General Purpose, Low Level and other types), vital capacity spirometers, pH meters, etc. . . or for direct-writing recording of one or two channels of a photographic recording system (e.g., Sanborn 564 and 558M) or a visual monitoring system (e.g., Sanborn 760 and 762).

FOR GENERAL PURPOSE DC RECORDING
The Model 299—21 lb., briefcase, 1-channel recorder . . . 5 and 50 mm/sec or 2.5 and 25 mm/sec chart speeds . . . sensitivities from 10 volts to 10 mv/div . . . frequency response 0 to 100 cps, down 3 db at 10 div peak-to-peak . . . inkless recording.

Model 320—2 complete channels in a one-cubic-foot

package—separate, current-feedback amplifiers with floating and guarded inputs . . . sensitivities from 2 volts to 0.5 mv/mm . . . full 50 mm for each channel . . . frequency response 0-125 cps, down 3 db at 10 mm peak-to-peak . . . choice of speed ranges—50, 25, 5, 2.5 mm/sec or 100, 20, 5, 1 mm/sec . . . inkless records. Model 322 also available, for low gain 2-channel recording.

FOR AC CARRIER AMPLIFIER RECORDING
Model 301—single-channel portable—same construction, physical specifications and chart speed options as Model 299. Self-contained AC carrier amplifier recorder . . . sensitivities to 10 microvolts rms/div . . . frequency response 0-100 cps, down 3 db, 10 div peak-to-peak . . . internal 2400 cps carrier frequency . . . uncalibrated zero suppression. For similar applications but in *two channels*, Model 321 is available as a carrier amplifier version of the Model 320 system.

Contact your nearest Sanborn Branch Office or Service Agency for complete details, or write Research Instrument Sales Manager:

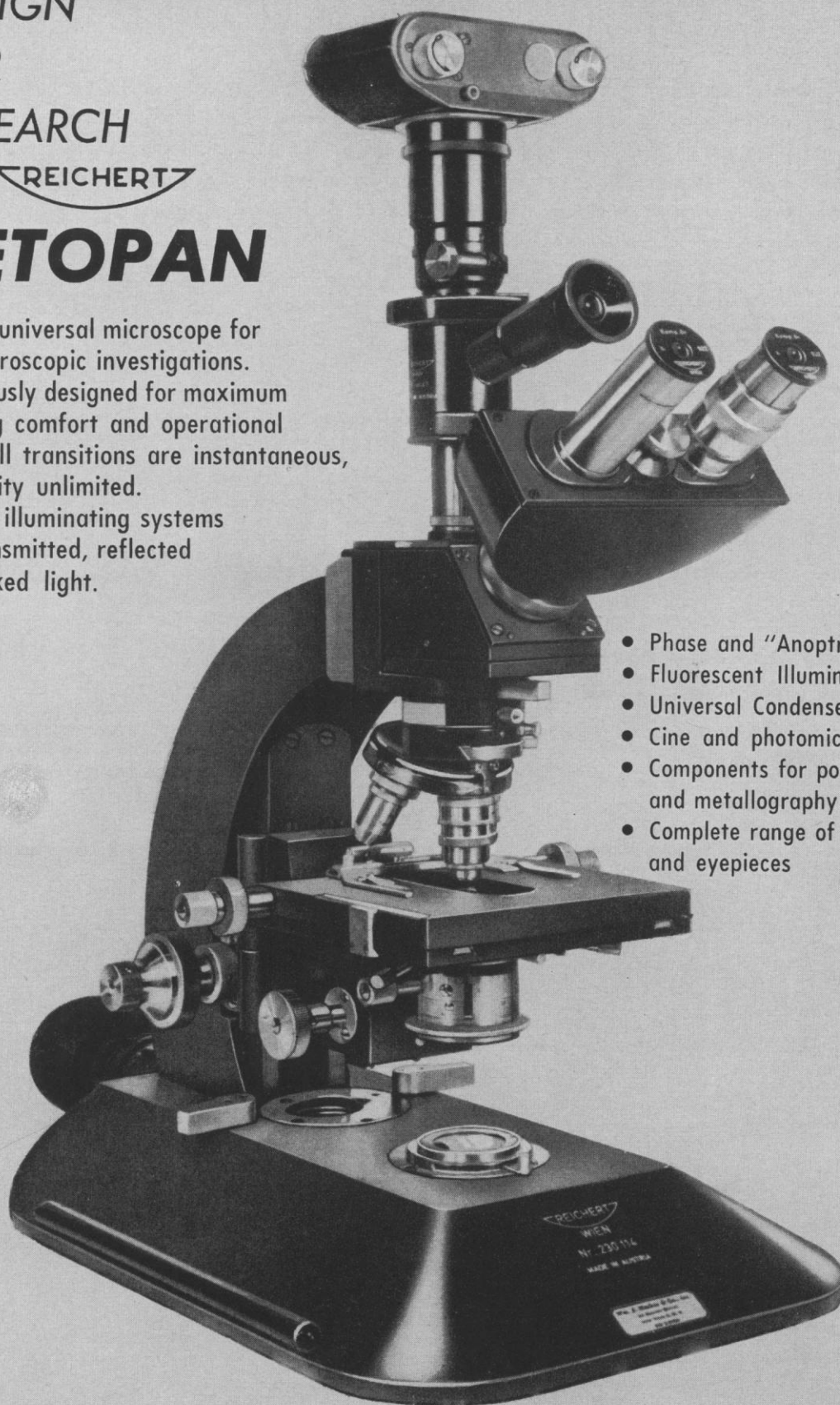
MEDICAL  DIVISION
SANBORN COMPANY
 175 Wyman St., Waltham 54, Massachusetts

DESIGN
FOR
RESEARCH

REICHERT

ZETOPAN

A truly universal microscope for ALL microscopic investigations. Ingeniously designed for maximum working comfort and operational ease. All transitions are instantaneous, versatility unlimited. Built-in illuminating systems for transmitted, reflected and mixed light.



- Phase and "Anoptral" Contrast
- Fluorescent Illumination
- Universal Condensers
- Cine and photomicrography
- Components for polarization and metallography
- Complete range of objectives and eyepieces

Request a demonstration or write for catalog

WILLIAM J. HACKER & CO., INC.

P. O. Box 646

Capital 6-8450

West Caldwell, N.J.

The first six years of Space Technology Leadership

Since 1954, when the Air Force ballistic missile program was accorded top national priority, Space Technology Laboratories has been engaged in virtually every major phase of research, development, testing and technical management of missile and space systems • STL's contributions have hastened the day of operational capability for Air Force ballistic missiles, and have been applied as well in satellite projects and space probes • Today, as STL's activities expand in significance and scope, STL offers exceptional opportunity to the outstanding scientist and engineer whose talents and training will add to, and benefit from, the accumulated experience that has enabled STL to conceive and accomplish major advances in the state-of-the-art • STL's creative flexibility, anticipating and responding to the demands of space progress, ranges in application from abstract analysis to complex hardware fabrication for military and civilian space projects • STL invites scientists and engineers to consider career opportunities in the atmosphere of Space Technology Leadership. Resume and inquiries will receive meticulous attention.

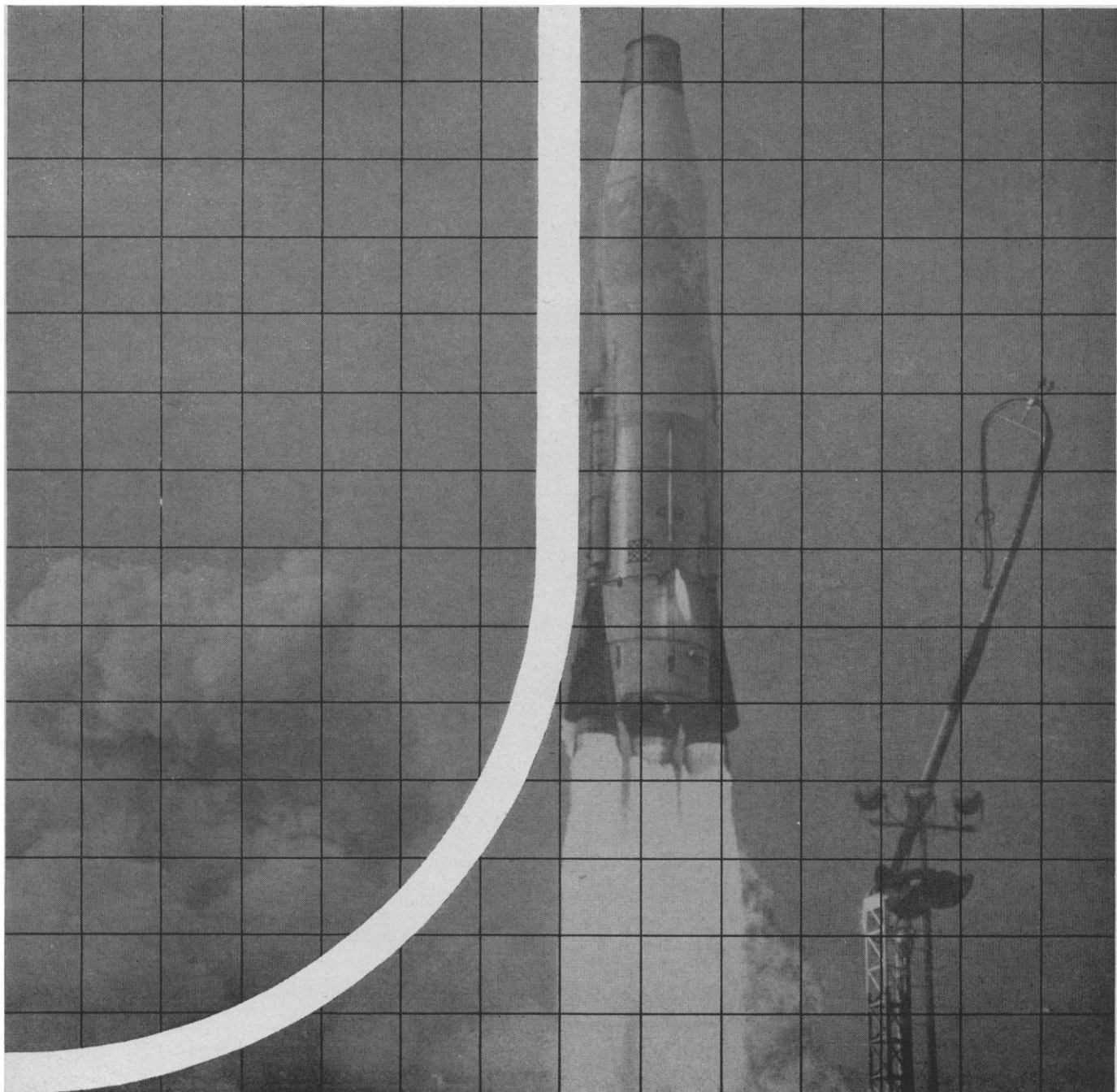
SPACE TECHNOLOGY LABORATORIES, INC. P.O. BOX 95005 JK, LOS ANGELES 45, CALIFORNIA

a subsidiary of Thompson Ramo Wooldridge Inc.

Los Angeles • Santa Maria • Edwards Rocket Base • Canoga Park



Cape Canaveral • Manchester, England • Singapore • Hawaii



OVER **20** YEARS EXPERIENCE & SERVICE...
*on special products
 for research
 in this new catalog*



New, revised printing of G.B.I. Catalog lists a wide range of amino acids, peptides, carbohydrates, adenylates, nucleates, purines, pyrimidines, enzymes, hormones, prepared microbiological media and prepared test diets for experimental animals.

PRODUCTS



FOR RESEARCH
GENERAL BIOCHEMICALS

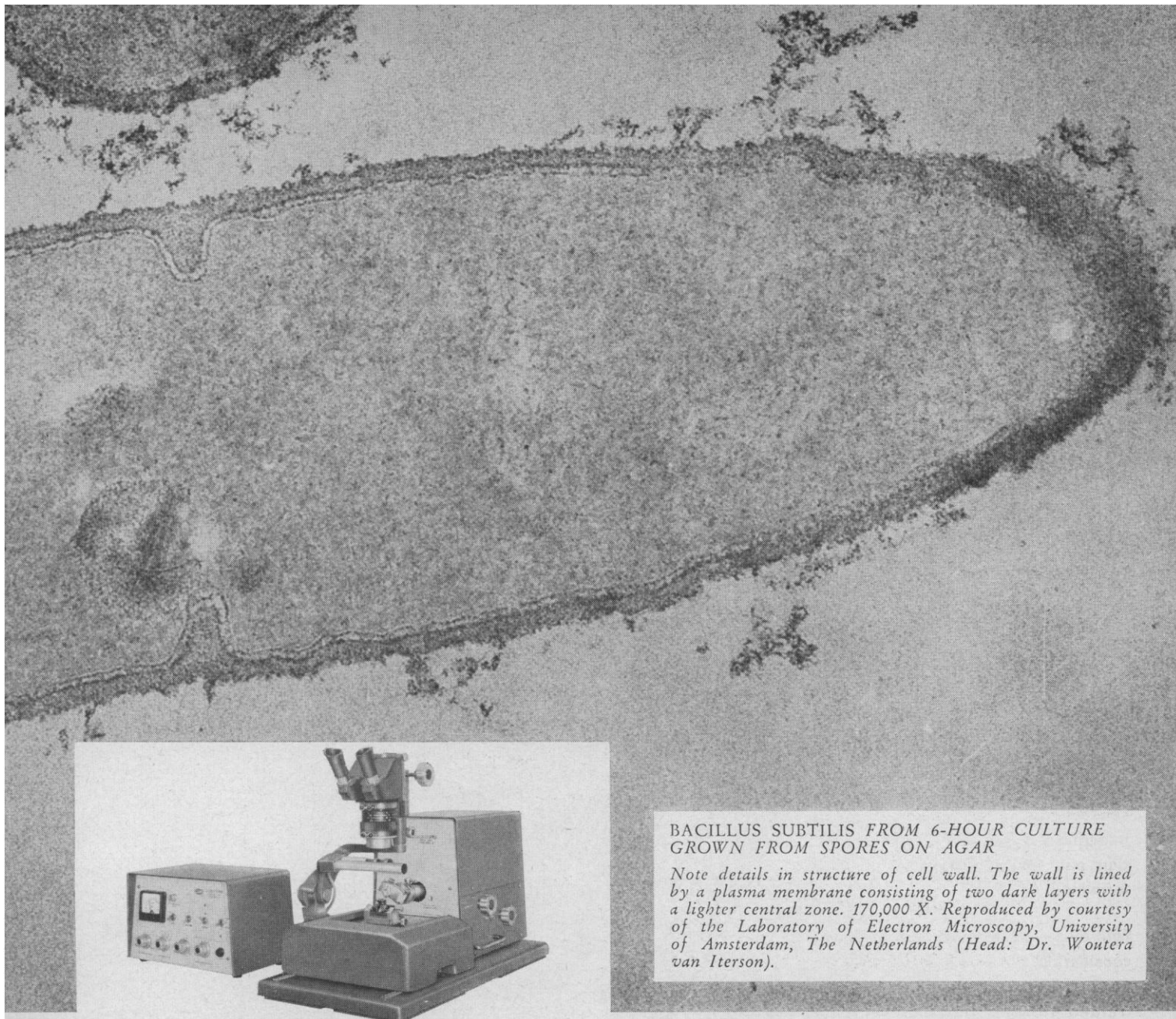
A Division of The North American Magul Products Co.

60 Laboratory Park
Chagrin Falls, Ohio

Phone: CHestnut 7-6464

MAIL TODAY

Name _____
 Title _____
 Organization _____
 Address _____
 City _____ Zone _____ State _____
 Cut-Out And Paste On Post Card



**BACILLUS SUBTILIS FROM 6-HOUR CULTURE
GROWN FROM SPORES ON AGAR**

Note details in structure of cell wall. The wall is lined by a plasma membrane consisting of two dark layers with a lighter central zone. 170,000 X. Reproduced by courtesy of the Laboratory of Electron Microscopy, University of Amsterdam, The Netherlands (Head: Dr. Wouter van Iterson).

*** SUPERIOR RESULTS IN ELECTRON MICROSCOPY**

The quality of the section, whether it is biological material, synthetic fibre or metal, is as important to picture quality as the performance of the electron microscope itself.

Cutting high-quality sections requires a high-quality ultramicrotome.

The LKB ULTROTOME® produces unlimited quantities of superior sections. It matches the work capacity and resolving power of the best electron microscopes available.

NEW ULTROTOME ACCESSORIES for advanced ultra-microtomy

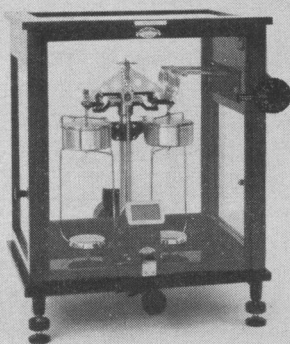
- Specimen Orientation Head with vernier scale to permit accurate and reproducible alignment of specimen relative to cutting axis — important in sectioning fibrous material (muscles, nerves, etc.).
- Diamond Knife Fixture incorporating a collecting trough. Accepts diamond knives from I.V.I.C., Venezuela.
- Single-hole "Grids" with 0.6, 0.8, or 1.0 mm dia. circular or 1×2 mm rectangular opening for serial sections. Standard grids with 75 to 400 mesh also available.
- Transparent Grid Box for convenient storage and safe transportation of up to 100 grids.

Write for 20-page brochure 4800-E04 and new price list PL-4800 listing these and many other practical Ultratome accessories. A 4-page reference list is also available.

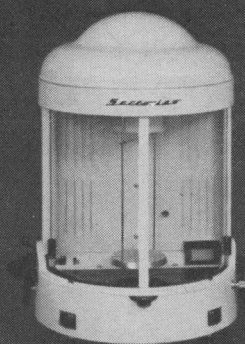


LKB Instruments Inc., 4840 Rugby Ave., Washington 14, D.C.

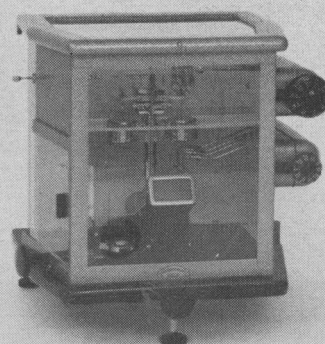
International Sales Headquarters: LKB-Produkter AB, P.O.Box 12220, Stockholm 12, Sweden.



SM-10—a superb research instrument offering semi micro accuracy at a comparatively reasonable price.



SELECTA RAPID—the most popular Selecta single pan balance for routine analytical procedures.



MPR-5—a two-pan classical micro balance in a modern metal housing incorporating the latest operating features.

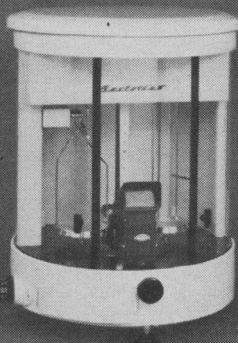
THE PRECISE BALANCE FOR THE PRECISE NEED...

The increasing use, in every field, of SARTORIUS balances is a natural consequence of their advanced design, unsurpassed craftsmanship in construction and the perfection of their performance.

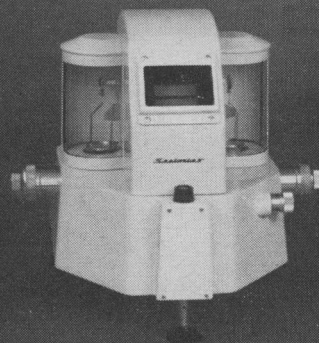
With these intrinsic qualities one who is considering the purchase of precision balances should keep in mind the highly trained service staff maintained by BRINKMANN, at ever ready call, as well as the unconditional service guaranty.

No balance need nor budget requirement has been overlooked by SARTORIUS, the world's largest manufacturer of analytical and other fine balances.

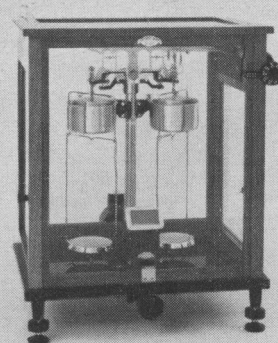
Write for descriptive catalog 442



PROJECTA—a truly modern two-pan balance featuring built-in weights, air damping and projection scale.



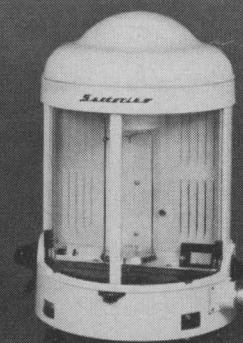
T-11—the speed and simplicity of a torsion balance for samples up to 4 grams with a sensitivity of 0.02 mg.



DP-2—the ideal automatic balance for the smaller laboratory and university classrooms.



KILOMAT—a new series of fully automatic precision balances for gross weighings in plant and laboratory.



SELECTA SMR—a new high sensitivity semi micro balance which provides faster operation.

SARTORIUS

BRINKMANN INSTRUMENTS, INC., 115 CUTTER MILL ROAD, GREAT NECK, N.Y.

Philadelphia • Cleveland • Houston • Miami • Menlo Park, Cal.

SARGENT

Laboratory Recorders



Model
MR

Model
SR

Designed and Manufactured by E. H. Sargent & Co.

Designed For Your Specific Laboratory Needs

The Model "MR" Recorder

Here is the ultimate in recorders designed exclusively for almost all measurements commonly made in the chemical laboratory. This instrument measures current and voltage and all other quantities which can be transposed into potential or current signals.

The Model "MR" features: 31 Potentiometric Ranges; 9 Chart Speeds, or 27 Chart Speeds with the Sargent Ratio Multiplier Attachment; and it is designed for laboratory bench operation.

S-72150 Sargent Recorder
(Pat. No. 2,931,964)..... **\$1725.00**

S-72151 Sargent Recorder
with Ratio Multiplier Attachment, 27
Chart Speeds..... **\$1775.00**

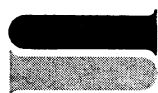
*For complete specifications
write for Bulletin R*

The Model "SR" Recorder

Sargent offers the Model SR to fill the need for a low cost recorder that features: maximum accuracy at a minimum cost; 250 mm width chart; fast balancing speed of 1 second; high sensitivity, high gain amplifier; and square cornering at 10,000 to 50,000 ohms input. This instrument provides the minimum required flexibility at the lowest possible cost.

S-72180 Sargent Recorder
(Pat. No. 2,931,964)..... **\$675.00**

*For complete specifications
write for Bulletin SR-B*

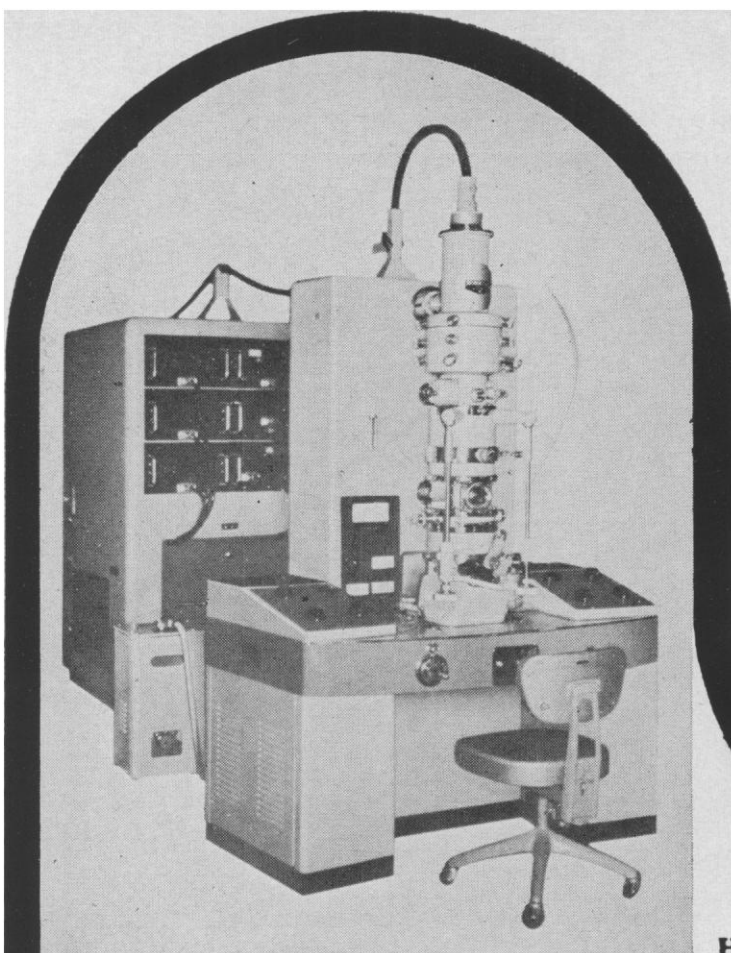


SARGENT

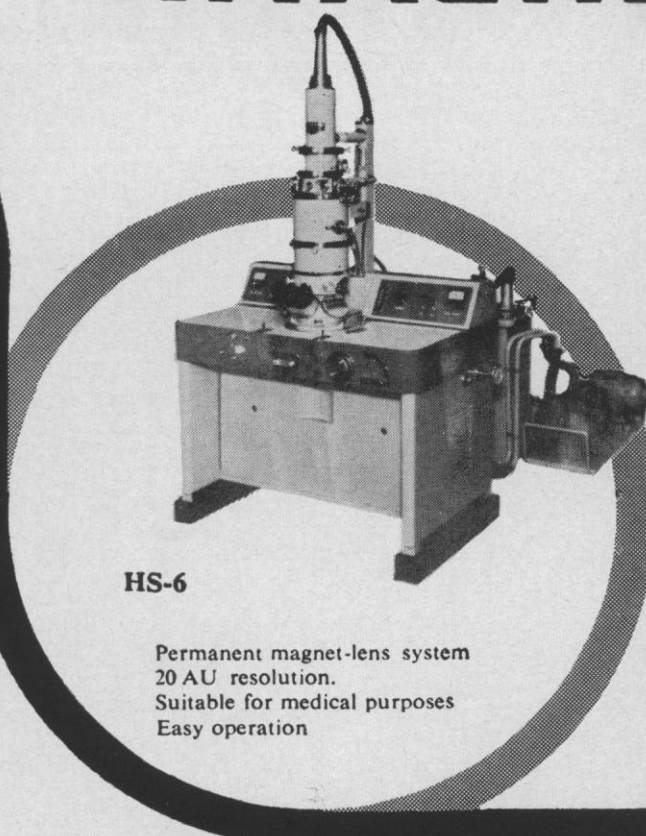
SCIENTIFIC LABORATORY INSTRUMENTS • APPARATUS • SUPPLIES • CHEMICALS

E. H. SARGENT & CO., 4647 W. FOSTER, CHICAGO 30, ILLINOIS
DETROIT 4, MICH. • DALLAS 35, TEXAS • BIRMINGHAM 4, ALA. • SPRINGFIELD, N.J.

HITACHI



HU-11



HS-6

Permanent magnet-lens system
20 AU resolution.
Suitable for medical purposes
Easy operation

Complete **HITACHI** Electron Microscope For All Scientific Institutes And Laboratories

Direct Magnification : 250,000 Times
Resolving Power : 8 ~ 10 AU

- Accelerating Voltage: 100,75 and 50KV
- Optical System: 3-stage magnetic lens system, 4 turret projection lenses, interchangeable during operation.
- Magnification: (Electronic) 400~250,000X
- Resolving Power: 8~10AU
- Minimum Area of Selected Field: $1 \mu^2$
- Accessories: Specimen heating and cooling devices, X-ray microscope unit, holder for diffraction, etc.

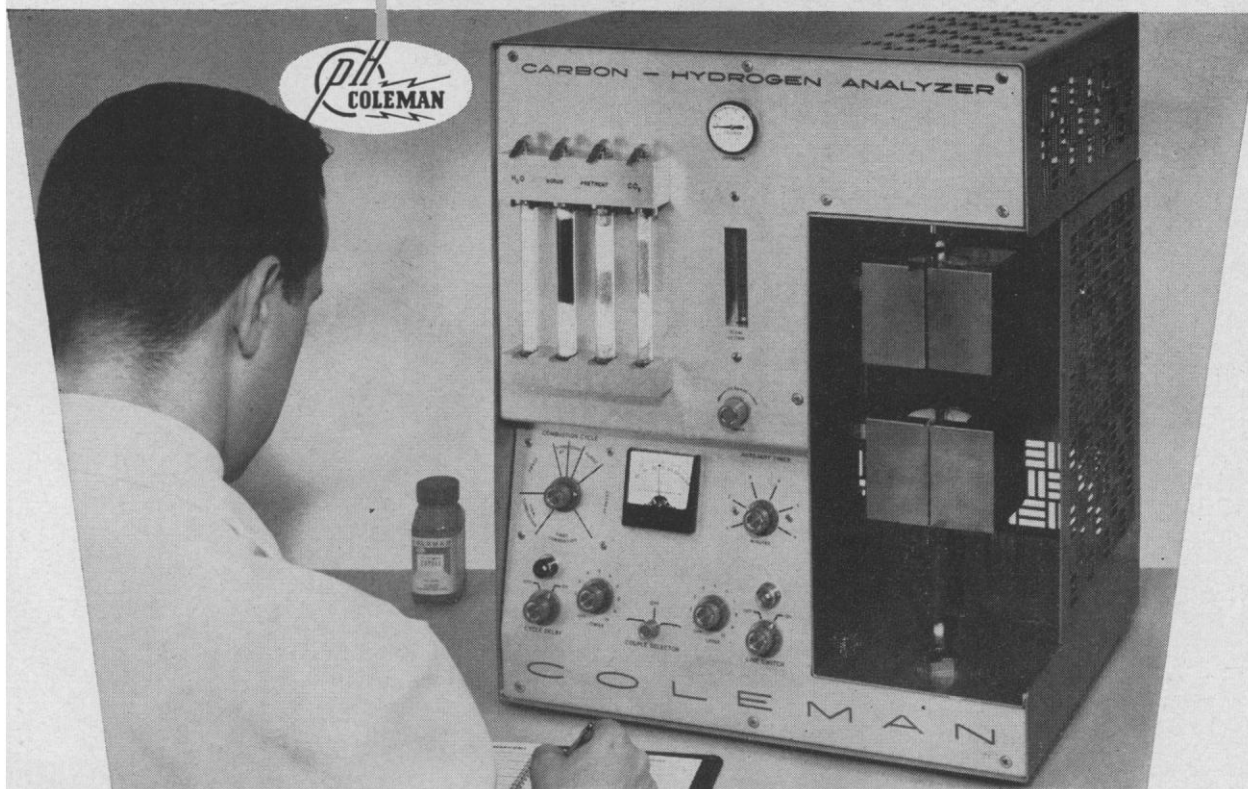
"HITACHI, Ltd. has now developed the new model HU-II, a unit featuring extremely high resolving power and being able to attach many kinds of accessories".

Erb & Gray Scientific, Inc.
854, S. Figueroa St., Los Angeles, California

 **Hitachi, Ltd.**
Tokyo Japan

Cable Address : "HITACHY" TOKYO

COLEMAN



NEW! Automated analysis of carbon and hydrogen

Coleman's new Carbon-Hydrogen Analyzer is fully-automated to bring new speed, new accuracy, and new ease to the analysis of these elements in organic materials. It programs and controls all variables—flow rates, combustion times and temperatures—of the accepted combustion method for carbon and hydrogen determinations.

This new instrument is valuable in laboratories concerned with foods, pharmaceuticals, petroleum, organic intermediates and similar materials. Outstanding characteristics are:

SPEED: Complete determination within an 8-minute operating cycle; routine analyses at the rate of 4 to 5 per hour.

ACCURACY: Results correspond to theory within $\pm 0.2\%$ carbon and $\pm 0.2\%$ hydrogen.

CONVENIENCE: All operations performed automatically—operator calculates results after differential weighing of absorption tubes.

VERSATILITY: Flexible controls permit any combustion analysis up to $1100^{\circ}\text{C}.$, with samples down to the milligram range.

ECONOMY: Pays for itself by increasing ana-

lytical precision and output. Uses commercial grade oxygen and readily-available reagents. Takes only 18 inches on laboratory bench.

ANALYTICAL RANGE

Hydrocarbons—paraffins, aromatics, naphthenes, aviation fuels, low-boiling materials;

Oxygen-containing materials—alcohols, phenols, glycols, ethers, esters, ketones, aldehydes, acids;

Nitrogen-containing materials—amines, amides, cyanides, cyanates, hydrazines, pyridines, nitro compounds;

Sulfur-containing materials—mercaptans, sulfides, disulfides, thiophenes;

Halogen-containing materials—alkyl mono- and dichlorides, alkyl bromides;

Mixtures of these materials.

See another FIRST in automated analysis by Coleman . . . at the Pittsburgh Conference.

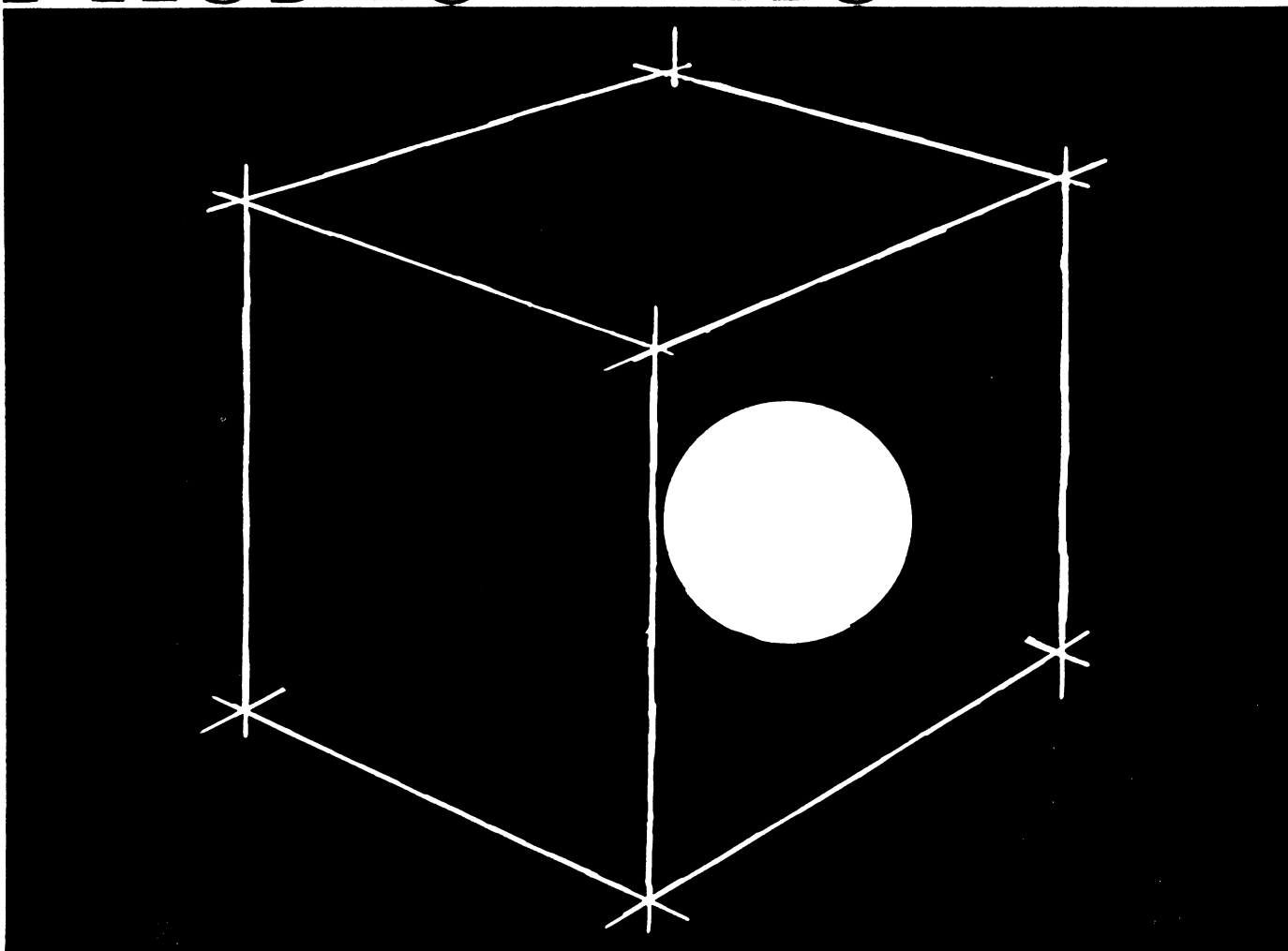
Ask your Coleman dealer for more information or write for Bulletin SB-272.

Order and simplification are the first steps toward mastery of any science

COLEMAN INSTRUMENTS, INC., MAYWOOD, ILLINOIS

MELPAR LAUNCHES: PROJECT PROBE

*The Parade of
Disciplines in the
Most Advanced
Areas of the
Physical Sciences*



Today, exploring in all of the physical sciences, Melpar is probing in many areas of fundamental research, such as:

Physical Chemistry, encompassing the relation of physical properties of biological materials to biological functions.

Physical Techniques and Measurements in such fields as electron spin resonance, in conjunction with the studies of molecular structure to determine Zeeman effects on free radicals.

Chemistry Studies in fluorescence, organic reactions, electrochemistry, polymer research, and gas chromatography and radiochemistry.

Why use gas chromatography? Why use electron spin resonance? These represent but a few of the areas Melpar is now exploring. This is Melpar: Project Probe.

Scientists with advanced degrees in any of the Physical Sciences, who are interested in participating in **Melpar: Project Probe**, are invited to write to F. J. Drummond, Professional Placement Manager, Melpar, 3354 Arlington Boulevard, Falls Church, Virginia.

MELPAR  **INC**
A Subsidiary of Westinghouse Air Brake Company

A report to the members of AAAS

AAAS SYMPOSIUM VOLUMES

published during 1959 and 1960

No.		Retail Members*		No.		Retail Members*	
65	Aging . . . Some Social and Biological Aspects			57	Systems of Units—National and International Aspects		
Nov. 1960	Nathan V. Shock, Ed. 436 pp., 65 illus., index	\$ 8.50	\$ 7.50	Dec. 1959	C. F. Kayan, Ed. 308 pp., index	6.75	5.75
64	Calcification in Biological Systems			56	Symposium on Basic Research		
July 1960	R. F. Sognnaes, Ed. 526 pp., 283 illus., 1 color page, index	9.75	8.50	Oct. 1959	Dael Wolfe, Ed., 328 pp., summary	3.00	2.50
63	Congenital Heart Disease			55	Photoperiodism and Related Phenomena in Plants and Animals		
June 1960	A. D. Bass and G. K. Moe, Eds. 372 pp., 147 figures, index	7.50	6.50	Oct. 1959	Robert B. Withrow, Ed., 921 pp., 256 illus., genera and species index, subject index	14.75	12.50
62	Water and Agriculture			54	The Human Integument—Normal and Abnormal		
June 1960	Roy D. Hockensmith, Ed. 206 pp., 21 illus., index	5.00	4.50	July 1959	Stephen Rothman, Ed., 270 pp., 59 illus., index	6.75	5.75
61	Biological and Chemical Control of Plant and Animal Pests			53	Grasslands		
Apr. 1960	L. P. Reitz, Ed. 286 pp., 11 illus., index	5.75	5.00	June 1959	Howard B. Sprague, Ed., 424 pp., 37 illus., index	9.00	8.00
60	Epidemiology of Mental Disorder			52	Evolution of Nervous Control from Primitive Organisms to Man		
Dec. 1959	B. Pasamanick, Ed. 336 pp., 6 illus., index	6.50	5.75	June 1959	A. D. Bass, Ed., 240 pp., 61 illus., index	5.75	5.00
59	Low-Level Irradiation			51	Zoogeography		
Dec. 1959	Austin M. Brues, Ed. 158 pp., 18 illus., index	3.75	3.25	Jan. 1959	C. L. Hubbs, Ed., 520 pp., 115 illus., author index, index of scientific names	12.00	10.50
58	Rehabilitation of the Mentally Ill						
Dec. 1959	M. Greenblatt and B. Simon, Eds. 260 pp., 3 illus., index	5.00	4.50				

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

* Members' prices are for orders submitted together with payment by AAAS members.

To: AAAS,

1515 Massachusetts Ave., NW, Washington 5, D.C.

Please send me the volumes circled: 65 64 63 62 61 60 59 58 57 56 55 54 53 52 51

☐ Payment of \$..... is enclosed. ☐ Please invoice at retail prices.

NAME

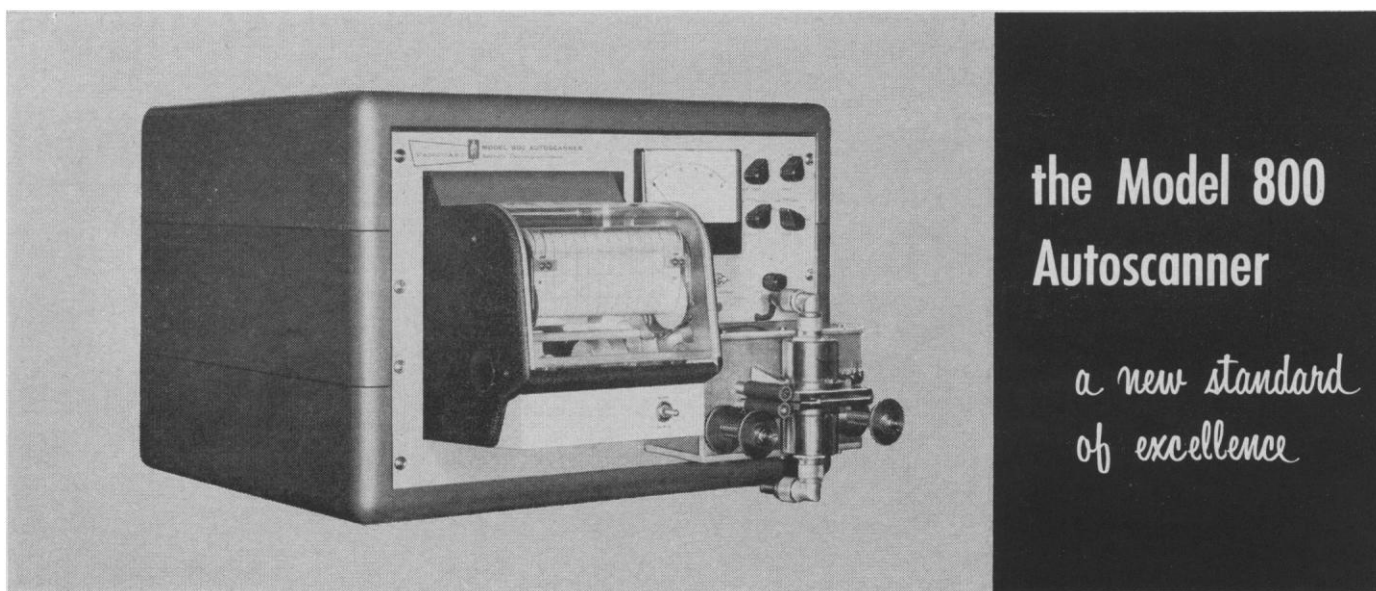
ADDRESS

CITY ZONE STATE

SENSITIVITY

chromatogram scanning of tritium

The VANGUARD MODEL 800 AUTOSCANNER leads the way to better analysis. Designed for maximum tritium sensitivity and employing the most advanced circuit techniques, the AUTOSCANNER offers the investigator unparalleled performance and reliability, while exhibiting truly remarkable efficiency for all beta emitting isotopes.



Advanced features of the AUTOSCANNER include:

Completely automatic operation frees personnel for other duties. Power and gas flow are automatically shut-off after scanning period. When scanning connected multiple strips, individual strip length is monitored and permanently recorded on the chart paper.

Specially designed dual scanning heads represent a major achievement in sensitivity for low energy radiation detection.

Completely transistorized circuitry incorporating plug-in modular construction eliminates all maintenance problems.

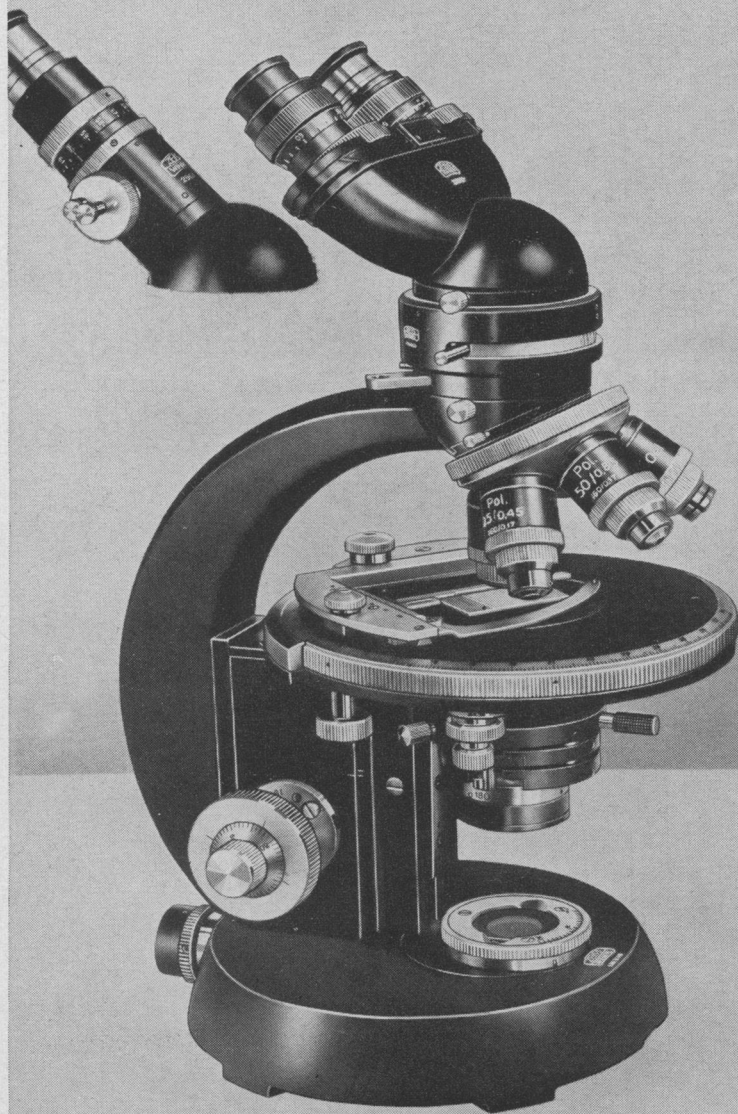
Further information and specifications may be obtained by writing to:

VANGUARD



INSTRUMENT COMPANY

Vanguard Instrument Company
Department A
P.O. Box 244
LaGrange, Illinois



WEST GERMANY

Polarizing Microscopes

The famous Carl Zeiss Polarizing Microscopes (GF and KF) are available for research and laboratory requirements in both binocular and monocular types. Both types feature the inclined-tube system for ease of operation.

Various accessories and equipment are also available to further broaden the application of these fine instruments.

Quadraxial Universal Rotary Stage

Stage of versatile adjustability for the application of modern methods in accurately and rapidly determining optical properties and orientations of crystals.



Other outstanding Carl Zeiss instruments include:
research, stereo and interference
microscopes
polarimeters, refractometers
spectroscopes, etc.

Write for free detailed specifications.

CARL ZEISS, INC.

485 FIFTH AVENUE, NEW YORK 17, N. Y.

COMPLETE
SERVICE FACILITIES

MATHESON

Compressed Gas Notes

Just Published—the basic laboratory
handbook of compressed gases

MATHESON GAS DATA BOOK

Third Edition 444 pages—68 tables—68 charts

PARTIAL CONTENTS

Information on use of 81 compressed gases

Safety procedures for each gas and a general
chapter, "Safe Handling of Compressed Gases"

Recommended controls and regulators for all gases with
dimensional drawings of connections

Toxicity and first aid procedures for hazardous gases

Physical constants and specifications

Cylinder handling and storage

The new Matheson Gas Data Book is the most comprehensive fact book and use manual on compressed gases ever published. It contains essential data on every compressed gas available for laboratory use. The information is presented in easy-to-use form, with liberal use of charts and tables.

The Gas Data Book describes eighty-one compressed gases, including specifications, physical constants, chemical properties, physical data, uses, recommended controls and other in-

formation. Safe handling procedures are suggested on each gas, and a discussion of toxicity and first aid procedures is included for each hazardous gas. A separate chapter is devoted to a general discussion of safe handling of compressed gases in the laboratory.

The Matheson Gas Data Book is the only complete compressed gas manual available. It is an essential reference for every laboratory and research library.

ORDER NOW The Gas Data Book is available only from The Matheson Company, Inc. The price is \$8.00, postpaid in United States and Canada. Order now for prompt shipment. **MAIL ORDER TO:** The Matheson Company, Inc., P.O. Box 85A, East Rutherford, N. J.

The Matheson Company, Inc.

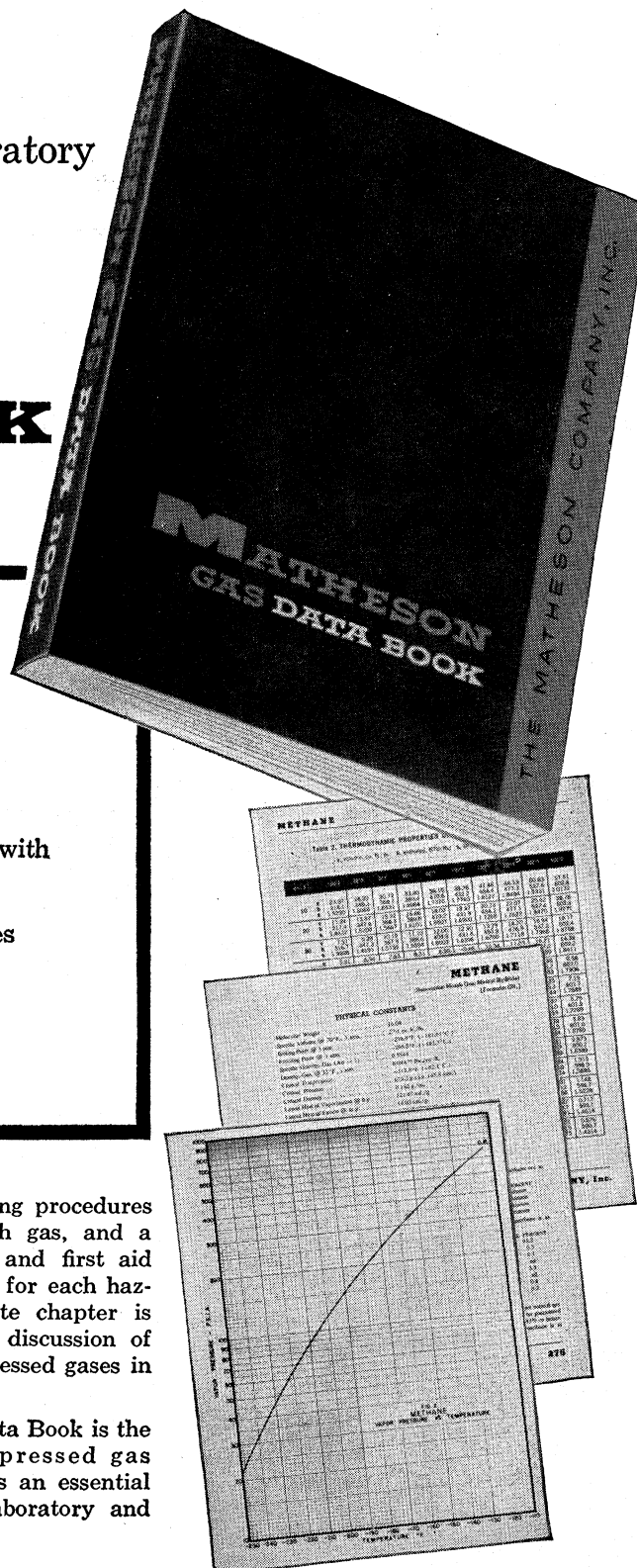
East Rutherford, N. J.

Joliet, Ill.

Newark, Calif.

Matheson of Canada, Ltd.

Whitby, Ont.



The information in this book was compiled by the Matheson Engineering Department for its own use, and to help Matheson customers. It is a company project, not an independent textbook. If, upon examination, you decide to return the book, we will refund the purchase price in full.

IEC



**INTERNATIONAL
MODEL PR-2
REFRIGERATED
CENTRIFUGE**

... first choice for
blood fractionations and
similar low temperature
separations.

**HERE'S WHY MOST LABORATORY
DIRECTORS SPECIFY THE INTERNATIONAL PR-2
FOR LOW-TEMPERATURE SEPARATION**

... It offers positive temperature control with wide-range versatility for separations between -20° and $+10^{\circ}\text{C}$.

The temperature you set on the control panel is automatically held within $\pm 1^{\circ}\text{C}$. In fact, material temperature can be maintained at 0°C indefinitely even at speeds up to 19,000 rpm ... without subcooling rotor or chamber!

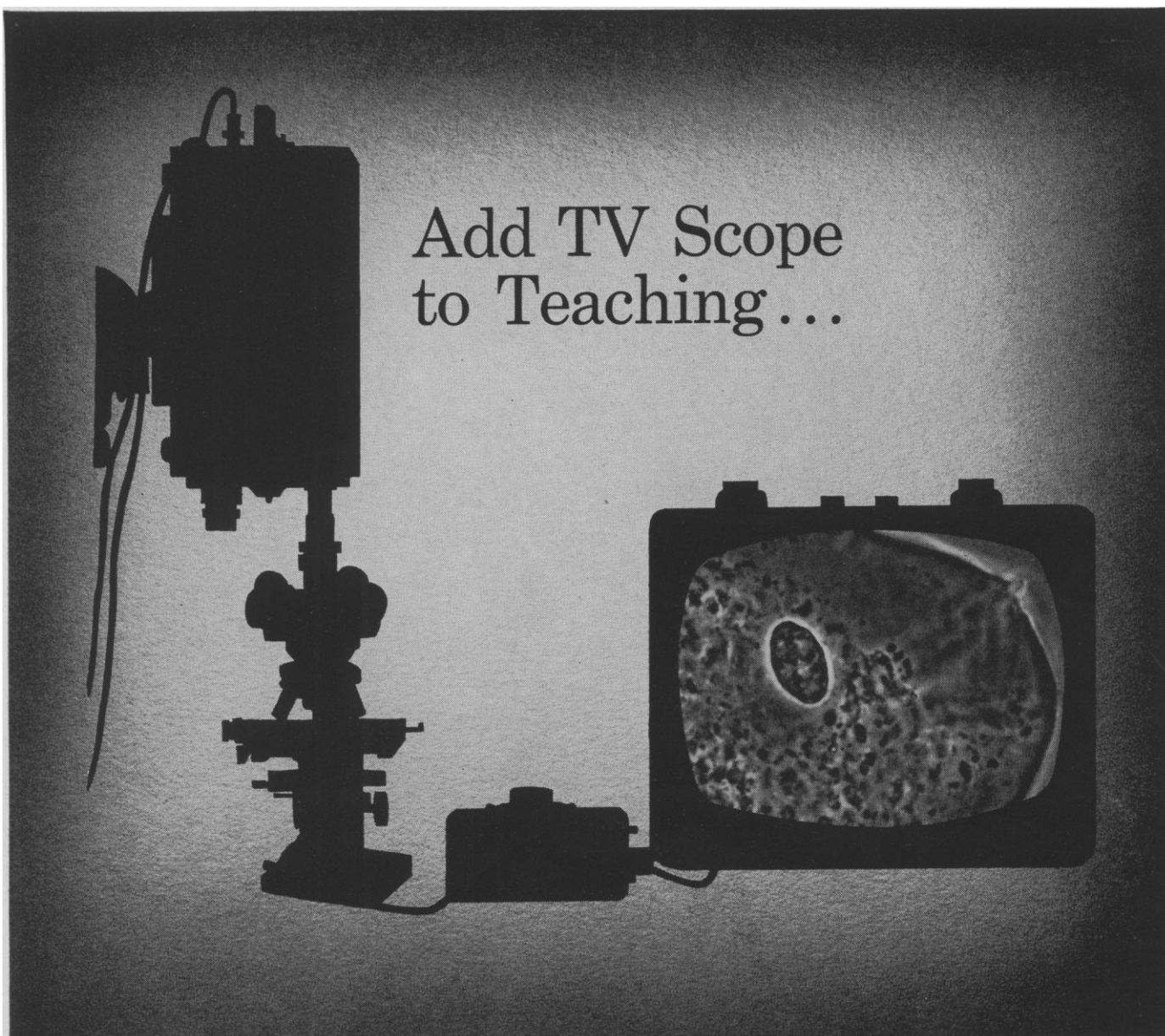
28 INTERCHANGEABLE HEADS ... horizontal, angle, high-speed, high-capacity and shaker ... provide accessory combinations to meet virtually all laboratory needs.

WIDE CAPACITY RANGE ... from 4 liters down to 7 ml. ... is unmatched in the refrigerated centrifuge class.

Write for Bulletin T.

INTERNATIONAL  EQUIPMENT CO.

BLDG. NO. 3B, 1284 SOLDIERS FIELD ROAD, BOSTON 35, MASSACHUSETTS



Add TV Scope
to Teaching...

Elgeet
of Rochester

Now Closes The Cost "Gap" On Closed Circuit TV

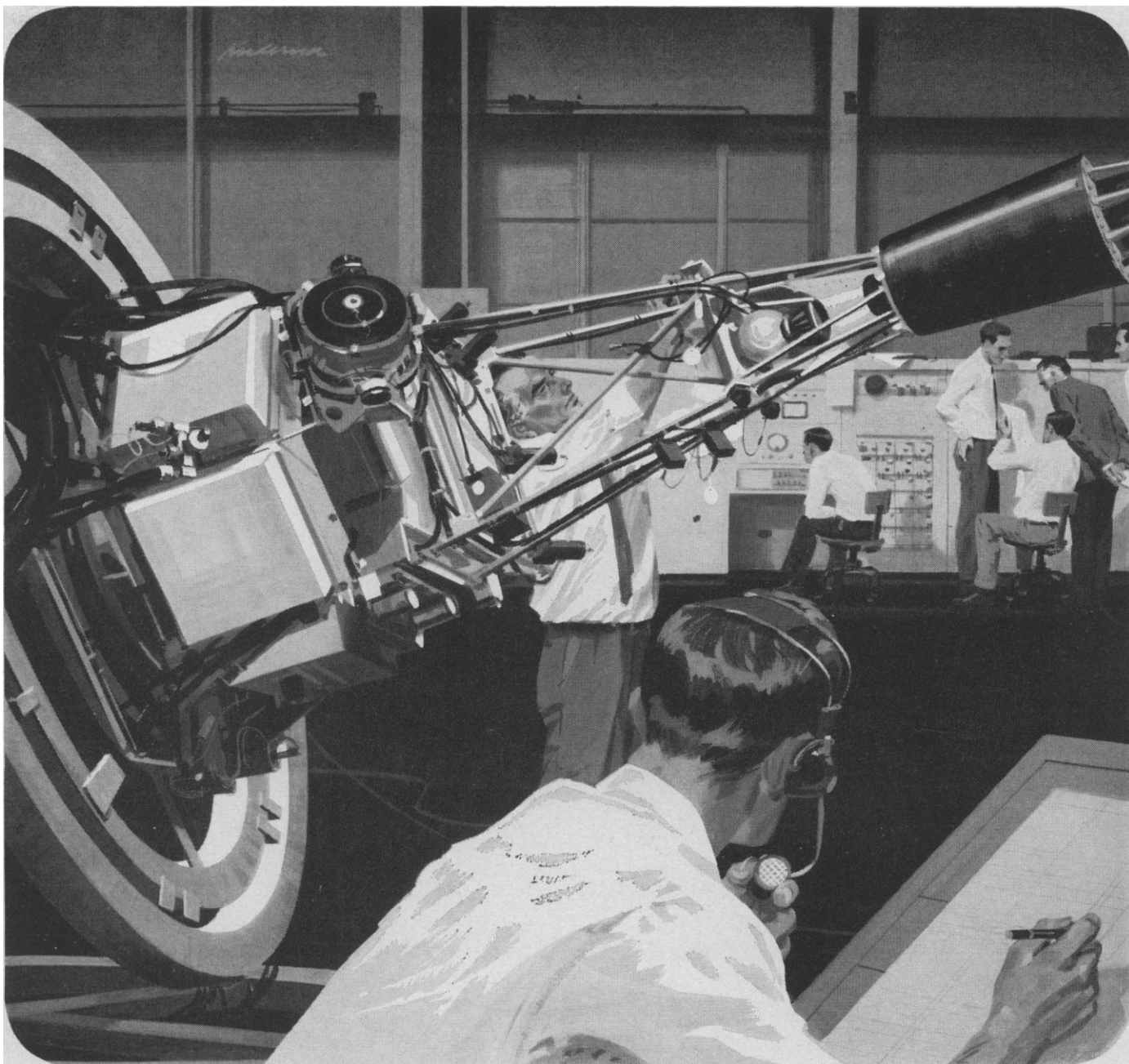
A COMPLETE system, including a research microscope, TV camera, and 17" monitor with 300 line horizontal resolution is now available from Elgeet of Rochester for **UNDER \$1500**. A COMPLETE system with 600 line resolution is available for **UNDER \$2200**.

Elgeet Closed Circuit Television Microscope-Integrated Systems, at these AMAZINGLY LOW prices, are the finest quality teaching tools that educators can buy for student-training programs.

For full details, write TODAY for Elgeet Booklet TVS8-1.

Elgeet OPTICAL CO., INC. . . . SCIENTIFIC INSTRUMENT AND APPARATUS DIVISION
838 SMITH STREET • ROCHESTER 6, NEW YORK
"Quality is our watchword . . . Precision Engineering our constant goal"

PIONEERING IN SPACE RESEARCH



DEVELOPMENT OF LUNAR SPACECRAFT

The "Ranger" series of spacecraft, designed first to explore the environment and later to land instrument capsules on the Moon, are now being developed and tested at Jet Propulsion Laboratory.

Illustrated is a "Ranger" proof-test model undergoing design verification testing at the Laboratory. Here design features are tested and proved, operational procedures developed and handling experience gained for the actual construction of the initial flight spacecraft.

This is one phase of JPL's current assignment from the National Aeronautics and Space Administration—to be responsible for the Nation's unmanned lunar, planetary and interplanetary exploration.

An advanced program such as this provides numerous objectives and incentives for qualified engineers and scientists who are eager to help solve the complex problems of deep space exploration.

Such men are welcome at JPL.

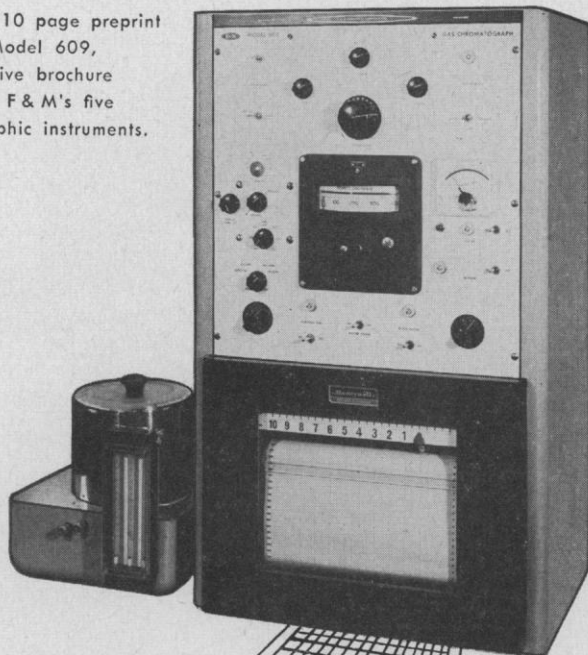


JET PROPULSION LABORATORY

Operated by the California Institute of Technology under contract with the National Aeronautics and Space Administration
PASADENA, CALIFORNIA

Employment opportunities for Engineers and Scientists interested in basic and applied research in these fields:
COMMUNICATIONS • INSTRUMENTATION • INFRARED • ASTROPHYSICS • GEOPHYSICS • GEOCHEMISTRY
• ASTRONOMY • PROPULSION • MASER • STRUCTURES • PHYSICS •
Send professional resume, with full qualifications and experience, for our immediate consideration

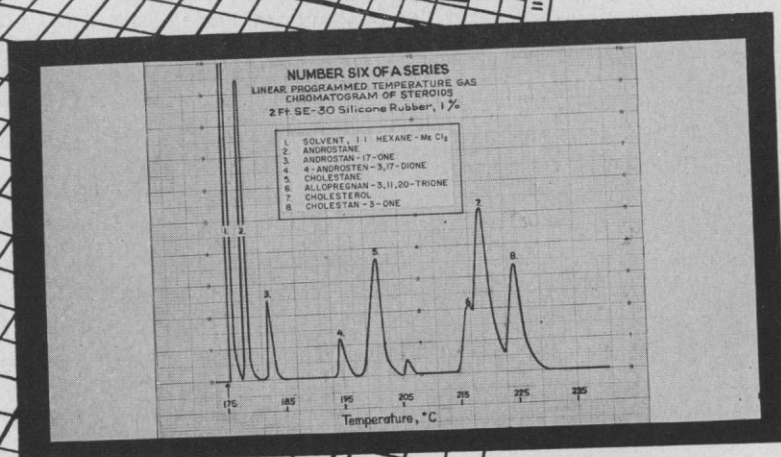
WRITE FOR 10 page preprint describing Model 609, and descriptive brochure summarizing F & M's five chromatographic instruments.



FLAME IONIZATION LINEAR PROGRAMMED TEMPERATURE GAS CHROMATOGRAPH • MODEL 609

FEATURING

- Independent operation to 300°C—column, detector, and injection port
- These temperatures indicated on recorder chart
- 18 linear heating rates from 0.23 to 35°C/min.
- Attenuation from 1 to 10,000,000



F&M

F & M SCIENTIFIC CORPORATION

1202 ARNOLD AVENUE, N.C.C. AIR BASE, NEW CASTLE, DELAWARE—EAST 8-6606

—6 OF A SERIES

LINEAR PROGRAMMED TEMPERATURE GAS CHROMATOGRAPHY

6. ANALYSIS OF STEROIDS

Gas chromatographic separation of steroids has been complicated by the high boiling points and susceptibility to thermal decomposition of these samples.¹ In addition, biological samples of steroids are generally mixtures with widely differing boiling points and, when constant temperature chromatographs are used for analysis, separate runs at different temperatures are required.

Recently, however, analysis of steroids has proved feasible by the use of: 1) stable column liquid phases; 2) ultra sensitive ionization detectors; and 3) temperature programming. Horning *et al.* introduced columns containing small amounts (1%) of SE-30 silicone gum rubber on the solid support.³ These columns both shorten the time and lower the temperature for analysis, but reduce the maximum sample size to a few micrograms. To utilize them, highly sensitive detectors such as flame or Beta-ionization become necessary.

With linear temperature programming, the column temperature is increased during a run from a low to a high value for optimum separation of all components. This technique permits a complete analysis of wide-boiling mixtures in a single run with one sample. Programmed temperature instruments also permit analysis of temperature sensitive steroids which decompose at flash vaporization temperatures. By lowering the injection port temperature, these materials are injected onto a cold column. After allowing several minutes for vaporization, the column temperature is increased to obtain the chromatogram.²

The chromatogram at the left was obtained on F & M's Model 609 Flame Ionization Linear Programmed Temperature Gas Chromatograph, using a 2 ft. column of 1% silicone gum rubber programmed from 175° to 235°C. Note that androstane was separated from the solvent and all the peaks have similar shape for easy analytical measurement. The same instrumentation and column are also adaptable to sterols, cholesterol esters, bile acids and alkaloids.³

LITERATURE CITED

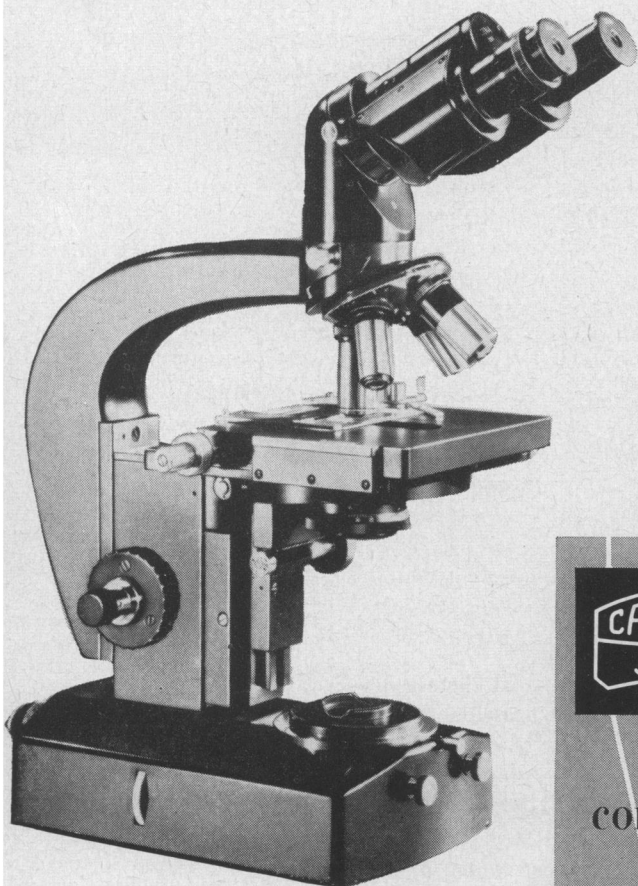
- (1.) Beerthuis, R. K., and Recourt, J. H., *Nature*, 186, 372-374 (1960).
- (2.) *Martin, A. J., Euston, C. B., and Martinez, F. W., Jr., "The Design and Evaluation of a Linear Programmed Temperature Gas Chromatograph Featuring a Hydrogen Flame Ionization Detector," presented at the Detroit Anachem Conference, October 1960.
- (3.) VandenHeuvel, W. J. A., and Horning, E. C., *Biochem. Biophys. Research Commun.*, 3, 356-360 (1960).

*Write F & M for free copies.

F&M

1202 ARNOLD AVE., N.C.C. AIR BASE
NEW CASTLE, DEL. PHONE EA 8-6606

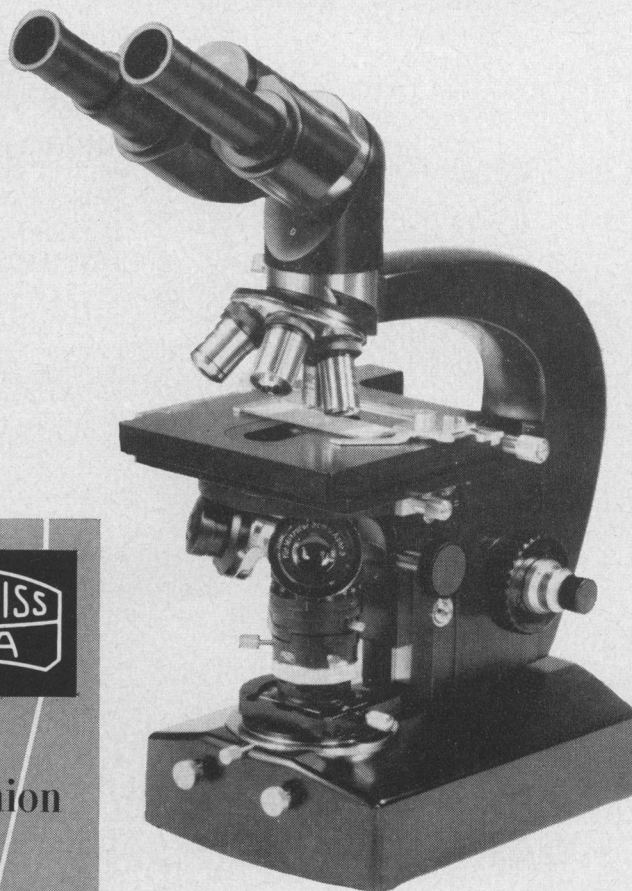
Carl Zeiss Jena presents a new series of research microscopes



Model NgoK— Routine and Research Microscope

The new Carl Zeiss Jena "Ng" series of routine and research microscopes combines traditionally elegant design with sturdy, built-to-take-it construction. The following outstanding features permit the user a degree of flexibility never before known in microscopy.

- Co-axial coarse and fine motion controls, the latter operating on ball bearings
- Unique tube-assembly provides the factor 1 for monocular and binocular observation
- Binocular tube has magnification-variator to permit changing total magnification without interchanging eyepieces
- Object stages easily interchanged
- A variety of condenser adaptors, including phase condenser, are readily interchanged
- Lamp and adjustable deflecting front surface mirror are mounted in base
- Koehler principle of illumination is satisfied
- Accessories permit numerous applications such as variable phase contrast, polarization, luminescence or other light sources, dark fields and photomicrography



Model NfpK Universal Research Microscope

The Carl Zeiss Jena "Nf" series represents the finest constructional and optical development of a true research microscope. Of the Universal type, it permits critical examinations in transmitted or reflected light. The instrument incorporates the best features of the earlier "Lp" and "Lu" models, all the innovations of the new "Ng" series, as well as the following:

- Triple-turret pancratic condenser... proven in service with the "Lp" model
- Pancratic condenser may be replaced by individual condensers with interchangeable condenser-supports
- Quintuple objective turret
- Easily converted for incident-light microscopy
- Pancratic condenser, with accessory annular stop, dispenses with conventional phase contrast condenser for variable phase contrast applications
- Polarization readily accomplished in conjunction with the pancratic condenser system

companion
of
scientific
progress
for
six
generations

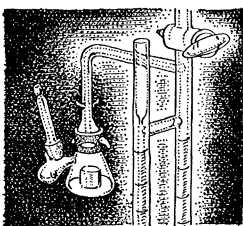
Complete information may be obtained from your local Carl Zeiss Jena instrument dealer or by writing: Dept. S 2/61

ERCONA

Ercona Corporation, Scientific Instrument Division, 16 West 46th Street, New York 36, N.Y.
In Canada: Jena Scientific Instruments Ltd., 1437 MacKay Street, Montreal, Quebec

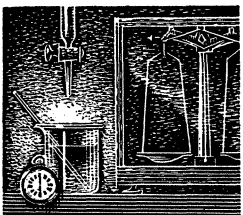
IT HAPPENED THIS MONTH...

a glance at yesterday in relation to today



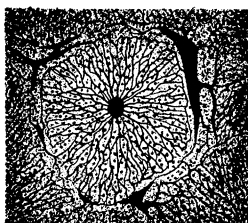
IN FEBRUARY—(1914)—investigation of the chemical structure of nucleic acids continues. Two years ago, Walter Jones (Johns Hopkins) reported the formation of guanylic acid from the hydrolytic action of pig pancreas on yeast nucleic acid, but this experiment “can be repeated with only occasional success. . . .” By substituting Lebedew’s commercial yeast for pig pancreas, Jones and Richards have now developed a procedure “which involves no judgment on the part of the experimenter.” Since by this new method, guanylic acid is invariably obtained as an end product, it is definitely a constituent of yeast nucleic acid.¹

Though yeast nucleic acid is still the best source of nucleotides, the methods for isolating them have improved immeasurably since 1914. By modern techniques employing specific enzymes and ion exchange chromatography, Schwarz BioResearch now produces GMP, GDP and GTP, as well as guanylic acid (mixed 2', 3' isomers). We also produce many other components of the nucleic acid molecule (both DNA and RNA): nucleotides, nucleosides, purines and pyrimidines, sugar and sugar phosphates — many also available radiolabelled.



IN FEBRUARY—(1934)—a famous physical chemist writes about the effects of heavy water upon tobacco seeds, yeasts, molds, flatworms and mice.² G. N. Lewis finds that heavy water is tolerated in high concentrations by the lower organisms, but the rate of vital processes appears to vary inversely with the percentage of H². This is not surprising, since substitution of H² for H¹ reduces the rate of *all* physico-chemical processes.

Recent reports have revived interest in the effect of deuterium on hydrogen bonding in macromolecules and the consequent effect on life processes. In the days of Lewis, tritium, the radioactive isotope of hydrogen, was not yet available. Now, tritium has become one of the most useful tracer atoms for biological experiments. Schwarz BioResearch has pioneered in the development of tritiated nucleosides and nucleotides. We also supply tritiated deoxyribose and optically pure tritiated-L-histidine. For specific activity and other information, write for our latest catalog and price list.



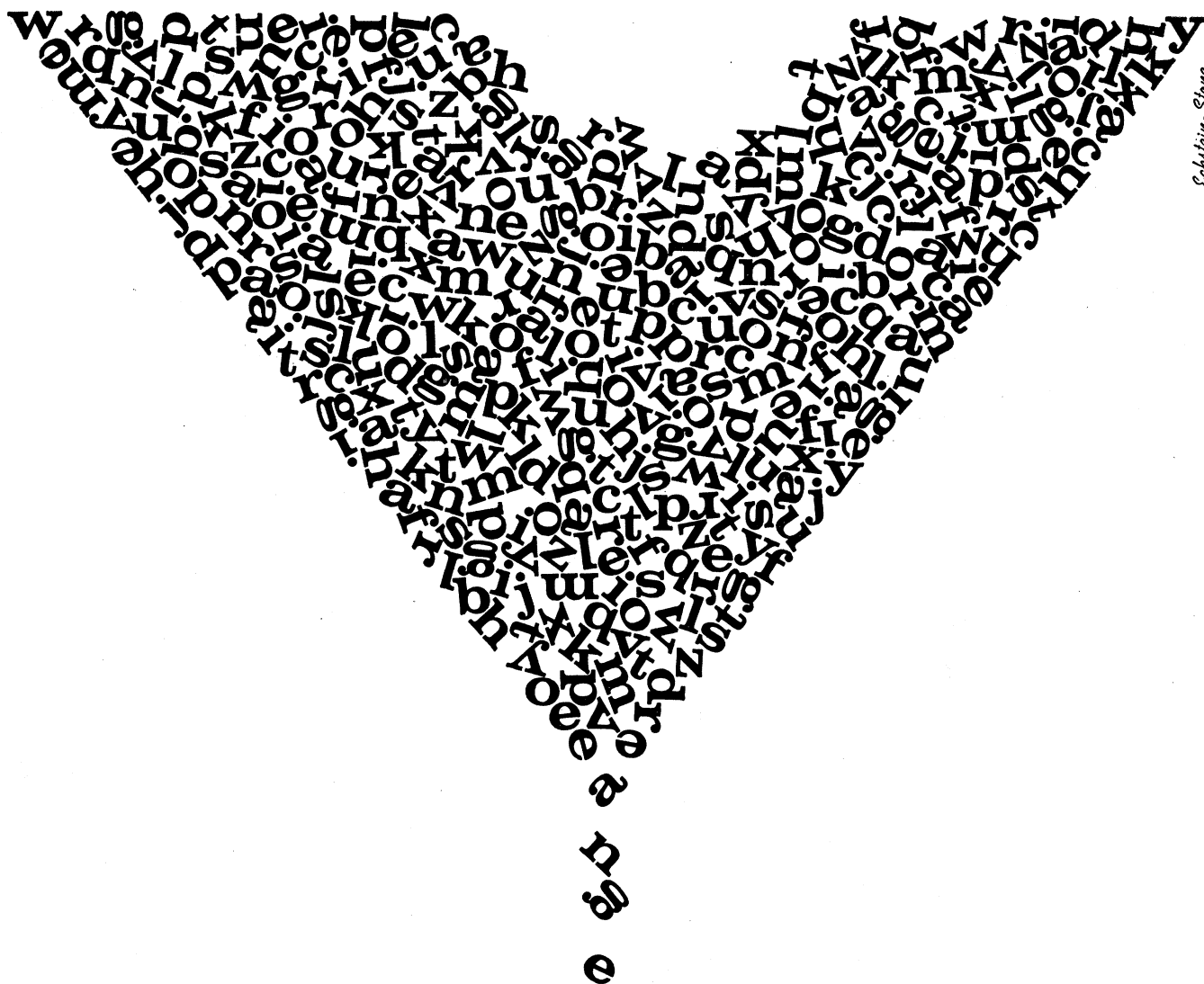
IN FEBRUARY—(1950)—Sanadi and Greenberg³ report on the metabolism of tyrosine and phenylalanine in experimental diabetes. These had previously been considered ketogenic substances since they increase ketonuria in phlorhizinized animals and produce acetoacetate when incubated with liver slices. However, when the authors administered C¹⁴-labelled phenylalanine and tyrosine to phlorhizinized rats, both the urinary glucose and ketone bodies were found to contain radioactivity. Therefore, the two amino acids should be considered *glycogenic* as well as *ketogenic*.

C¹⁴-labelled phenylalanine and tyrosine are only two of many C¹⁴-labelled amino acids produced by Schwarz BioResearch in packages of 10, 50, 100 and 500 microcuries. The 10 and 50 microcurie packages are maintained in stock for 24-hour shipment. We also make amino acids labelled with S³⁵ and N¹⁵ and can supply a group of O¹⁸-labelled amino acid derivatives.

1. Jones, W., and Richards, A. E.: The partial enzymatic hydrolysis of yeast nucleic acid. *J. Biol. Chem.* 17:71 (Feb.) 1914. 2. Lewis, G. N.: The biology of heavy water. *Science* 79:151 (Feb. 16) 1934. 3. Sanadi, D. R. and Greenberg, D. M.: Metabolism of C¹⁴-labelled tyrosine and phenylalanine in phlorhizinized rats. *Arch. Biochem.* 25:257 (Feb.) 1950.

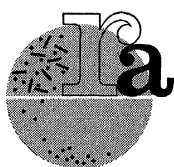


SCHWARZ BIORESEARCH, INC. • Dept. 2B • Mount Vernon, New York
BIOCHEMICALS • RADIOCHEMICALS • PHARMACEUTICALS *for research, for medicine, for industry*



Eckstein-Stone

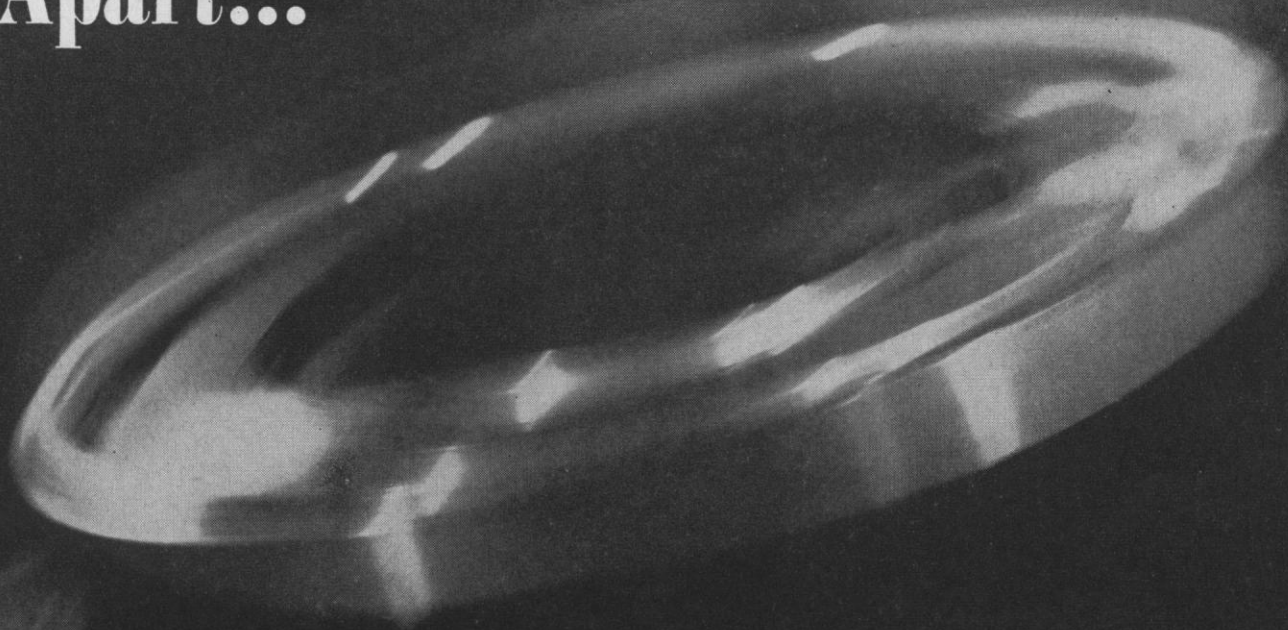
The analyst who has **1** never been besieged with laboratory filtration problems just doesn't exist. Nor does a filter paper exist with the magical property of **r** being all things to all analysts. Even Reeve **e** Angel does not yet have the panacea of **o** filter papers. But, we do offer a vast selection in a diversified line to meet almost every need **e** you are likely to encounter—and a skilled **e** technical staff who can make intelligent, **A** knowledgeable recommendation on your **e** specific filtration problems. We invite your inquiries. Write today for a list of Reeve Angel **e** filter products.



ngel
reeve angel
reeve angel
reeve angel

9 BRIDEWELL PLACE • CLIFTON, NEW JERSEY

Separate and Apart...



In a class by itself—the Clay-Adams centrifuge line—for virtually every office or laboratory separation procedure. Models include high speed or hand driven, heavy duty or lightweight . . . single or multi-purpose table machines. All Clay-Adams centrifuges are designed for optimum speed and efficiency. All feature precision engineering, sturdy construction; permanent lubrication insures years of trouble-free operation.

Adams Safety-Head Centrifuge



Ideal for all precipitate separations frequently performed in the clinical laboratory or physician's office. Efficient angle head for six 15 ml. or smaller tubes provides rapid centrifugation. Compact, shock mounted, portable.

Other models available from your dealer include:

Sero-Fuge®: Ideal for blood banks. Specifically for Coombs Test; blood grouping, typing, and cross-matching.

Safeguard Centrifuges: For hospital, clinical and hematology laboratories with a relatively heavy work load. Wintrobe hematocrits, blood chemistries, and other separations rapidly performed.

Micro-Hematocrit: For blood banks, clinical and hospital laboratories. Provides complete separation of serum and red cells in 3 minutes.

**in laboratory science . . .
trusted tools for
precision performance**

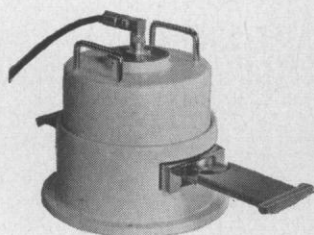
Clay-Adams

New York 10, N.Y.

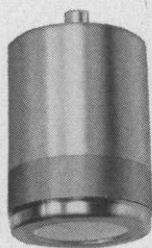
Now you can do ALL your sample counting

AUTOMATICALLY...with the New *Tracerlab*

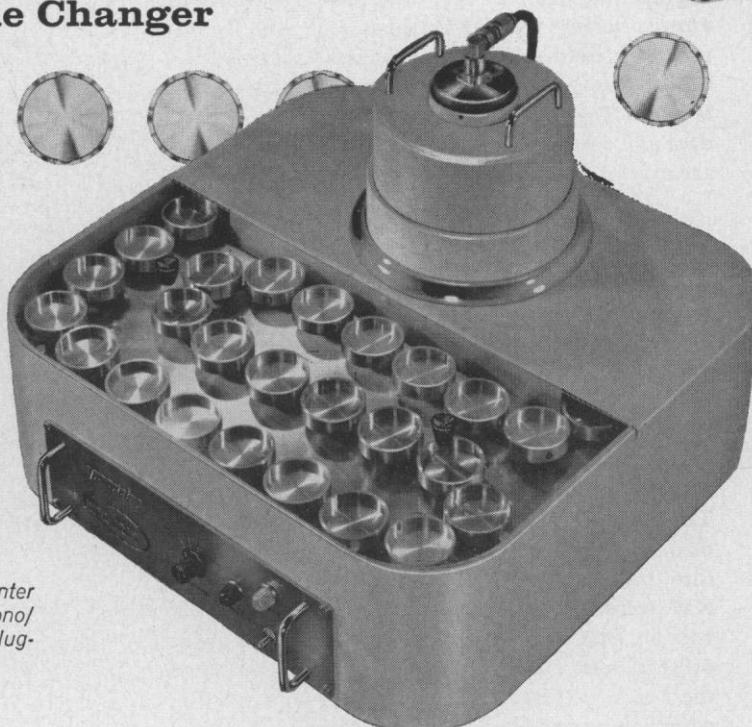
multi/matic Sample Changer



The SC-101 Manual Flow Counter with ultra-thin Mono/mol Window Detector.



New FD Series Flow Counter with the ultra-thin Mono/mol Window features plug-in assembly.



Fifty sample capacity . . . any size up to two inch . . . any type of detector (Scintillation, Flow Counters, GM Tube) . . . simple one-knob operation . . . these exclusive advantages plus low initial cost and low operating costs . . . are all yours in the outstanding new Tracerlab MULTI/MATIC Sample Counting System.

Only from Tracerlab — the world's largest and *first* manufacturer of Sample Changers could you expect — and get — such a revolutionary new system.

The New SC-100 MULTI/MATIC Sample Changer provides positive, accurate positioning of samples. Samples are readily accessible because they are loaded and driven on a horizontal plane (in contrast to tower or stack types). Automatic recycling of a single sample, automatic bypass of empty sample positions, automatic recycling to the starting position plus the ability to operate with all types of detectors are other features of this most versatile new Tracerlab development.

The New Tracerlab FD-1 and FD-2 Flow Counters feature the ultra-thin Tracerlab Mono/mol window (less than $125\mu\text{g}/\text{cm}^2$). These low cost units, available in 1" or 2" window diameters plug in to a common shield and feature low background . . . excellent plateau characteristics . . . very low gas consumption and will operate with a wide

variety of counting gases including helium-isobutane, argon-methane, methane or natural gas.

The New Tracerlab SH-1 Shield operates with either the automatic changer or the SC-101 Manual Changer pictured. It accommodates both the 1" and 2" FD Series Flow Counters, windowless flow counters, P-20D Scintillation Detectors or standard GM detectors. Convenient handles make it easy to insert or remove from any changer, shield thickness of 2 inches of lead provides low reproducible backgrounds.

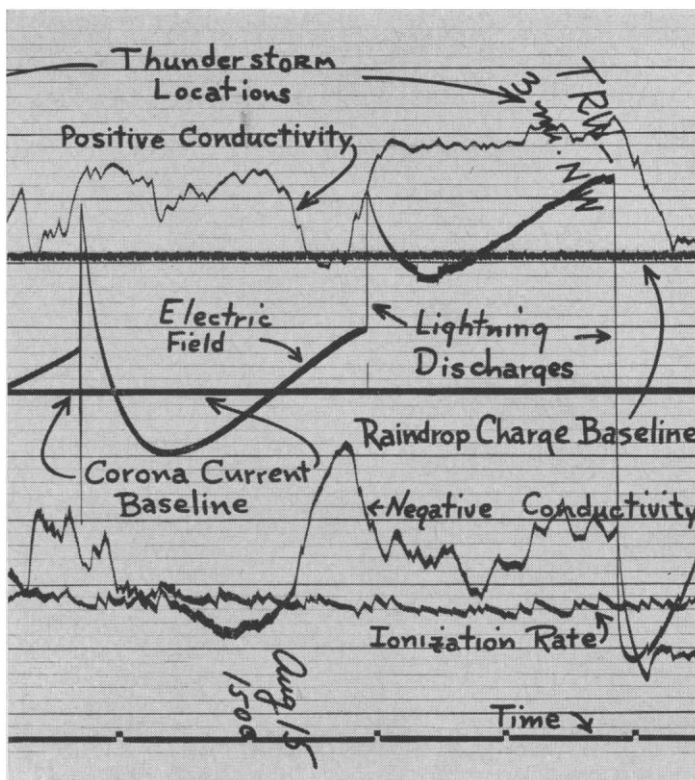
The Tracerlab MULTI/MATIC Sample Counting System when combined with other Tracer/matic components . . . scalars, time and count printers, or time, count and CPM printers . . . provides more specific sample information than any other system.

For complete specifications on the new low cost, economical-to-operate Tracerlab MULTI/MATIC Sample Changer write for Bulletin M.

Tracerlab 

1601 Trapelo Road, Waltham 54, Massachusetts
2030 Wright Avenue, Richmond 3, California

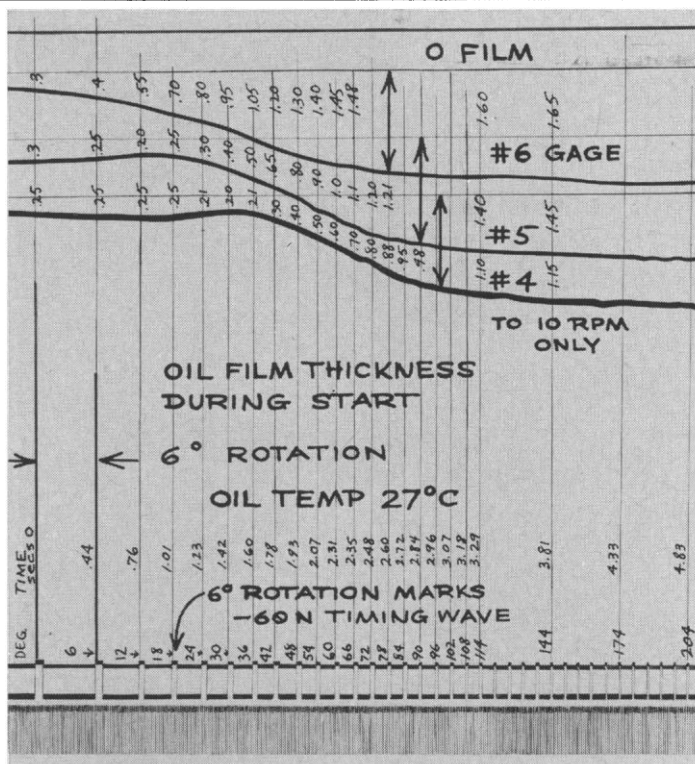
The analog record at upper right, made by a Model 906A Honeywell Visicorder oscillograph, gave U. S. Weather Bureau scientists immediate readout of thunderstorm data at Mt. Washburn in Yellowstone National Park. As the storm system passed, the Visicorder measured and recorded positive and negative air conductivity, rate of ionization of air, raindrop charge, corona discharge current from an insulated tree and a 4'x 6' grass plot, times of camera exposure photographing droplet size and electrical charge, atmospheric potential gradient, and time. In any research field where high-speed variables are under study, the direct-recording Visicorder is providing instantly-readable, high-sensitivity data at frequencies from DC to 5000 cps. Models are available with 8, 14, or 36 channel capacities.



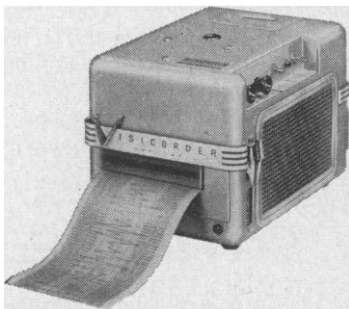
In industrial use...

The Visicorder record at lower right, made by design engineers at Westinghouse, measured oil film thicknesses on the bearing pads of a 67,500 KW water wheel generator supplied for Chief Joseph Dam at Bridgeport, Wash. In these tests, oil thickness encountered by the leading edge of the bearing (trace #6), center (#5) and trailing edge (#4) were found to be within the limits of safety as predicted by engineering assumptions. In this and hundreds of other scientific and industrial applications, Visicorders are pointing the way to new advances in product design, rock-etry, computing, control, nucleonics, and production testing.

For information on applying the unlimited usefulness of the Visicorder to your specific problems, phone your nearest Honeywell Industrial Sales Office.



Unretouched records 2/3 actual size.



REFERENCE DATA: Write for Visicorder Bulletins 906, 1108, 1012 and 1408.

Minneapolis-Honeywell Regulator Co., Industrial Products Group, Heiland Division, 5200 E. Evans Ave., Denver 22, Colorado

17 FEBRUARY 1961

439

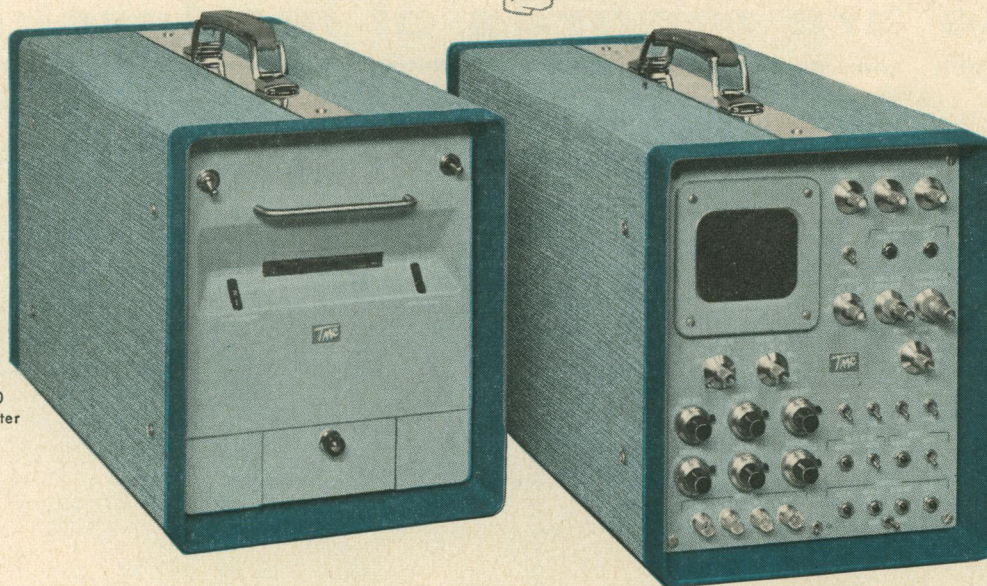
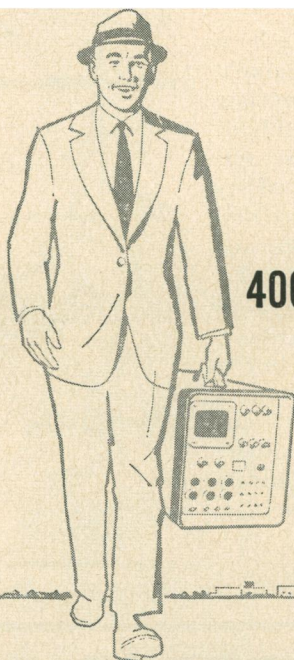
Honeywell



Industrial Products Group

the first portable, "desk-top"

400-channel pulse height analyzer



Model 500
decimal printer

Model 404
pulse height analyzer

— the TMC Model 404

The new TMC Model 404 is the most portable pulse height analyzer you can own. Take it and use it anywhere. With its all-transistor, printed circuitry and 400-channel memory in a package just over a cubic foot, this analyzer is small enough to operate on your desk. All the instruments needed for an experiment can be carried easily by one person.

The Model 404 has a magnetic core memory that can be

used in sub-groups of two or four; four separate inputs and associated amplifiers; internal pulse routing circuitry; pushbutton data transfer and display overlap; very low power requirements and many "system" advantages. And it can be used with the new solid state detectors.

For readout, use its companion unit, the Model 500 Decimal Printer; a high speed paper tape punch; strip chart or X-Y recorders; or an IBM electric typewriter.

LITERATURE ON REQUEST



TECHNICAL MEASUREMENT CORPORATION

441 WASHINGTON AVENUE NORTH HAVEN, CONNECTICUT

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 <i>Publisher</i>	HANS NUSSBAUM <i>Business Manager</i>
---------------------------------	--

GRAHAM DUSHANE
Editor

JOSEPH TURNER <i>Associate Editor</i>	ROBERT V. ORMES <i>Managing Editor</i>
--	---

ELLEN E. MURPHY, *Assistant Editor*
 NANCY TEIMOURIAN, *Assistant to the Editor*
News: HOWARD MARGOLIS, BETHSABE ASENJO
Book Reviews: SARAH S. DEES
Editorial Assistants: NANCY S. HAMILTON, EDGAR
 C. RICH, BARBARA SUTHERLAND, CONRAD YUNG-
 KWAI
Staff Assistants: PATRICIA D. PADDOCK, LOIS W.
 WOODWORTH

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-GALLAVAN (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 or for the opinions expressed by contributors. For detailed suggestions on the preparation of manuscripts, see *Science* 125, 16 (4 Jan. 1957).

Advertising correspondence should be addressed to SCIENCE, Room 740, 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. If possible, furnish an address label from a recent issue. Give both old and new addresses, including zone numbers, if any.

Annual subscriptions: \$8.50; foreign postage, \$1.50; Canadian postage, 75¢. Single copies, 35¢. Cable address: Advancesci, Washington.

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

A Question of Degrees

The degree of doctor of philosophy was awarded for the first time in this country by Yale University 100 years ago tomorrow. It was modeled after the German Ph.D. and was designed to be the highest earned academic degree and to certify mastery of a subject-matter field and the performance of original research.

The degree is now well established, and it is one of the best known of the 1600 different degrees currently awarded. But this was not always so: in its early days the high prestige of the degree led some universities and colleges to begin awarding it as an honorary degree, a practice that blurred its significance as an earned degree with a research requirement. The number of honorary Ph.D.'s steadily increased and reached a peak of 50 in 1889. Even by 1881 the abuse had become so flagrant that the American Philological Association passed a resolution, concurred in by the AAAS, which deprecated "the removal of this degree from the class to which it belongs . . . and its transfer to the class of honorary degrees." By 1896 the organization of graduate schools (Federation of Graduate Clubs) resolved that "the degrees of Ph.D., Sc.D., M.D. and Pd.D. should never be given *honoris causa* or in absentia." Despite this caveat and others, the number of honorary Ph.D.'s showed no rapid decline; there were 23 in 1900, 35 in 1901, and 20 in 1907.

The battle to maintain the integrity of the degree was won—or nearly won—as a consequence of the academic outcry that arose when Gonzaga University conferred an honorary Ph.D. on Harry L. (Bing) Crosby in 1937. Few institutions have had the temerity to award one since.

The number of earned doctorates (and from 1920 on this includes the degree of Doctor of Education) has shown a continuous increase. About 177,000 were awarded between 1861 and 1960. In 1920, the number was 615; in 1930, 2299; in 1940, 3290; in 1950, 6633; and in 1960, more than 10,000 (the compilation of figures is not yet complete).

So much for statistics; but what do you call a Ph.D. to his face, Mister or Doctor? Everyone knows that a surgeon is called "Mister" in England, but that physicians are called "Doctor" both socially and professionally in the U.S. The British novelist Pamela Hansford Johnson, in an article entitled "It's Easy to Get Americans All Wrong," in the *New York Times Book Review* on 1 January, confesses her bafflement about academic titles. "In America, the usage seems to vary from campus to campus. On some, 'Professor X' or 'Doctor' gives way to the over-all 'Mister'. On others, the title is used, and is expected to be used. How shall a foreigner . . . get these things right?" The confusion is not confined to foreigners. In some universities the administrators call all Ph.D.'s "Mister," but students and colleagues call them "Doctor." Often, but not always, Ph.D.'s are "Misters" socially. In industry and government, both socially and professionally, they are "Doctors," as they are also in the pages of the *New Yorker*, *Time*, the *Saturday Review*, and the *New York Times*. The *Washington Post* reserves the title for those in the health fields, but occasionally slips up on Dr. Wernher von Braun and Dr. George Gallup.

We hope this brief essay will add nothing to the confusion of either natives or foreigners. Doubtless during the next century the number of Ph.D.'s will continue to increase, and some stabilization in the form of address will occur.—G.DuS.

[The information given above was derived largely from *Academic Degrees*, by W. C. Eells and H. A. Haswell (U.S. Government Printing Office, 1960), and *American Universities and Colleges*, Mary Irwin, Ed. (American Council on Education, ed. 8, 1960). The figures for 1960 were supplied by L. R. Harmon of the National Academy of Sciences—National Research Council.]



It's What's Inside That Counts!

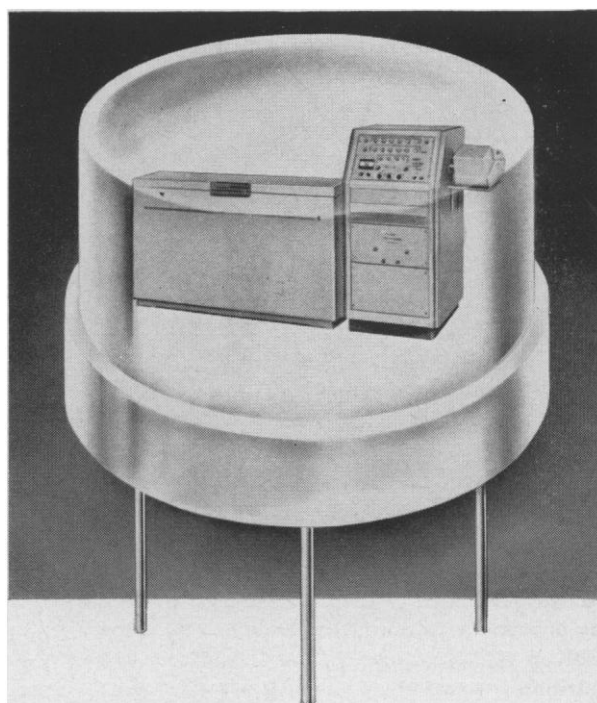
Packard Tri-Carb Liquid Scintillation Spectrometer

Visit us at Booth 97 - at the FASEB

Accurately and automatically achieves the best experimental results presently possible utilizing the latest radioactive tracer counting methods for such materials as proteins, lipids, amino acids, tissue, body fluids, aqueous solutions, tritiated water, and carbon dioxide.

In the first six months after the transistorized Tri-Carb replaced its vacuum-tube predecessor, more than a hundred installations were made in 15 countries on four continents. More samples of tritium, carbon-14, and other alpha- and beta-emitters are now being counted in the Packard Tri-Carb Spectrometer than in any other instrument.

You will be interested in our latest bulletin, which shows "what's inside" the transistorized Tri-Carb Spectrometer that makes it count so well . . . so reliably.



WRITE OR PHONE, REQUESTING BULLETIN 315.

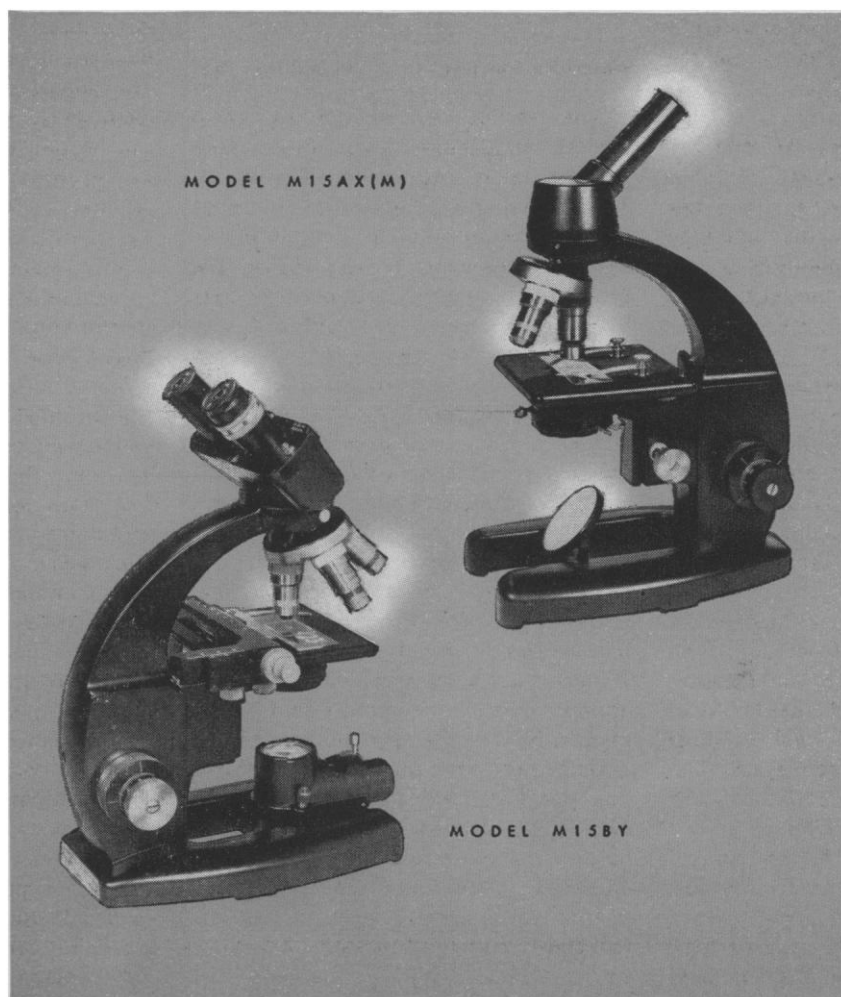
*TRI-CARB LIQUID SCINTILLATION SPECTROMETERS • AUTO-GAMMA SPECTROMETER
SYSTEMS • FRACTION COLLECTORS • FLOW DETECTORS • RATEMETERS • SCALERS*

Packard Instrument Company, Inc.

BOX 428-A, LA GRANGE, ILLINOIS

• PHONE HUter 5-6300

CHICAGO • ALBUQUERQUE • ATLANTA • BOSTON • LOS ANGELES • NEW YORK • PHILADELPHIA • PITTSBURGH
SAN FRANCISCO • WASHINGTON, D.C. • ZURICH • PARIS



The Cooke M15 . . . gives you superior optical performance . . . a clean,
rational design for maximum versatility, convenience and durability . . .
carefully executed in the finest materials . . . at York in England.

Model M15AX(M) 60X to 400X, \$220.00

Model M15BY 30X to 1000X, \$454.00

Send for details on these and other M15 models.

COOKE, TROUGHTON & SIMMS, INCORPORATED

91 WAITE STREET, MALDEN 48, MASSACHUSETTS • IN CANADA: 77 GRENVILLE STREET, TORONTO

mission of the felony for which convicts were serving sentences in Raiford (Florida) State Prison (Shaw Grigsby, University of Florida).

Also, containment is posited as a new operational theory for criminology (Walter Reckless, Ohio State University). A scientific concept for criminal responsibility is perhaps the most crucial issue in contemporary criminology (Frank Hartung, Wayne State University). A complete reorganization and reorientation of the Liberian National Police becomes effective in 1961, reflecting the influence of an ICA survey and the increasing urbanization and westernization of the Liberian population (Stephan Horton, Liberian Na-

tional Police). International exchange of information is as basic to advances in criminal law and criminology as it is to advances in other scientific fields (Horst Schroder, University of Tübingen). The International Penal and Penitentiary Commission contributed significantly to advances in penology during the past century, and its files and reports, now indexed, are a gold mine for penological researchers (Thorsten Sellin, University of Pennsylvania). August Vollmer introduced scientific experimentation and professional standards to American policing and is outstanding among 20th-century contributors to criminological and police science (John Kenney, University of

Southern California). Study of some 600 murders during a 4-year period in Philadelphia has introduced new methodological techniques of value in criminological research and has called into question certain commonly held, though unvalidated, assumptions as to the previous arrest and conviction records of murderers (Marvin Wolfgang, University of Pennsylvania).

The 1959 annual award of the American Society of Criminology was presented to Thorsten Sellin, president of the International Society of Criminology, for distinguished contributions to the science of penology. August Vollmer awards for research in criminology were presented to Paul Bohannon, Northwestern University anthropologist, for his *African Homicide and Suicide*, and to Marvin E. Wolfgang (University of Pennsylvania) for his *Patterns in Criminal Homicide*.

Officers of the American Society of Criminology for 1961 are as follows: president, Donal E. J. MacNamara (dean, New York Institute of Criminology); vice-presidents, Karl Menninger (Topeka, Kansas), Sheldon Glueck (Harvard), Gordon Barker (University of Colorado), and Pedro M. Velez (director of special investigations, Commonwealth of Puerto Rico); executive board member, John Kenney (University of Southern California); secretary-treasurer, Jacob Chwast (chief consulting psychologist, Educational Alliance, New York). Marcel Frym, the outgoing president, was named principal program consultant for the 5th International Congress of Criminology, to be held in Los Angeles in 1962. Charles Newman (University of Louisville) was appointed coordinator of research and studies for the congress, and Clyde Vedder (Northern Illinois University) was appointed liaison officer, to work with the sociology departments of American universities.

JACOB CHWAST, *Secretary-Treasurer*

Sociology of Science

The session on "Sociology of Science: The Organization of Research" was cosponsored by Section K and the American Sociological Association. The session was organized by Vincent H. Whitney (University of Pennsylvania) and chaired by Simon Marcson (Princeton and Rutgers). Marcson also reported on the organization of an industrial research laboratory and the relation of authority to organization.

William Evan (Bell Telephone Lab-

Here's new safety in storing and dispensing laboratory liquids. Nalgene carboys are made of unbreakable polyethylene. (Ever see the slivers fly when a glass carboy was dropped?) It's proof against acids, caustics, corrosives. (What if that shattered glass carboy had been full of H_2SO_4 ?)

Nalge's new spigot never drips. There's added safety, too, in the ease of carrying Nalgene carboys—as little as $\frac{1}{10}$ the weight of glass. And they're so much lower in cost. In short, they satisfy just about every laboratory requirement you can think of—another step in Nalge's continuing program of product improvement through plastics research. Ask your laboratory supply dealer.

New catalog on the full line of Nalgene plastic laboratory ware now available. Write Dept. 212

TEFLON is a Reg. T. M. of E. I. duPont & Co., Inc.



THE NALGE CO., INC. ROCHESTER 2, NEW YORK
The Quality Standard of Plastic Laboratory Ware

Just Published

Annual Review of ENTOMOLOGY Vol. 6 Jan. 1961

Annual Review of PSYCHOLOGY Vol. 12 Feb. 1961

Other Annual Reviews

PHYSIOLOGY	Vol. 22	Mar. 1960
MEDICINE	Vol. 11	May 1960
PLANT PHYSIOLOGY	Vol. 11	Jun. 1960
BIOCHEMISTRY	Vol. 29	Jul. 1960
PHYSICAL CHEMISTRY	Vol. 11	Sept. 1960
MICROBIOLOGY	Vol. 14	Oct. 1960
NUCLEAR SCIENCE	Vol. 10	Dec. 1960

In Preparation: Vol. 1 Apr. 1961

Annual Review of PHARMACOLOGY

Most Back Volumes
Available
\$7.00 postpaid (U.S.A.)
\$7.50 postpaid (elsewhere)

ANNUAL REVIEW, INC.
231 Grant Avenue
Palo Alto, California

**new
england
nuclear**

L-Methione-S³⁵

L-Cystine-S³⁵

\$75. per Millicurie

CATALOG ON REQUEST

new england nuclear corp.

575 ALBANY STREET, BOSTON 18, MASS. Liberty 2-5964

PAPER CHROMATOGRAPHY APPARATUS

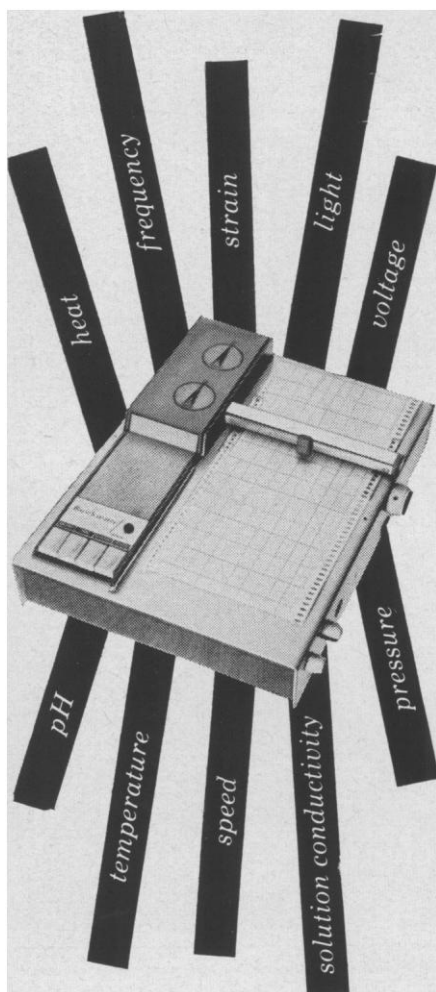
Write for
Catalog K-50
Describing Special
Apparatus for
Paper
Chromatography

electric desalter
for the removal of
inorganic salts from
sugars, amino acids,
and other organic acids
in preparing samples
for paper chromatography

apparatus for eluting
paper chromatograms
and for small scale
two-dimensional
chromatography

insulated, double glass
cabinets for ascending or
descending chromatography
on paper strips or sheets

KENSINGTON SCIENTIFIC CORPORATION
1717 FIFTH STREET • BERKELEY 10, CALIFORNIA



versatile recorder for laboratory and plant use

The new Beckman Potentiometric Strip-Chart Recorder is low-cost and simple to operate. Compact, push-button unit features *continuously adjustable* input voltage span of 10 to 100mv full-scale, facilitating its use with pH meters, spectrophotometers, and many other laboratory or process control instruments. Pen response is 1.0 second full-scale, and pen zero can be set to any point throughout the 5" pen travel. Chart speed is 1" per minute, and additional speeds are available with plug-in units. Other accessories include a circular chart recording adaptor and an external circuit controller. Unit may be wall-mounted or placed on laboratory bench. Ask your Beckman laboratory apparatus dealer for complete information, or write for Data File 38-7-21

Beckman
Scientific and Process Instruments Division
Beckman Instruments, Inc.
2500 Fullerton Road
Fullerton, California

oratories) continued the discussion of the industrial laboratory in terms of the pressures and role strains created by a specific organizational form. David N. Solomon and Silvia Lamb of McGill University reported on a study of industrial scientists (chemists) and their values vis-à-vis science. Norman Kaplan (Cornell) compared the role of the research administrator in the Soviet Union with that of his counterpart in the United States and pointed out differences which suggest the possibility of a simplification of administrative practices in large-scale research organizations in this country.

A vigorous discussion followed, with participation from the floor.

VINCENT H. WHITNEY,
Program Chairman

Population Trends and Policies

The session on population trends and policies in the Communist countries was cosponsored by Section K, the American Sociological Association, and the Population Association of America. The growth of population, changes in population structure and distribution, and the consequences of these developments were discussed for three major regions with Communist governments. Jerry W. Combs, Jr., (Foreign Manpower Research Office, U.S. Bureau of the Census) reported on Eastern Europe; John F. Kantner (Population Council) analyzed changes in the Soviet Union; and Irene Taeuber (Office of Population Research, Princeton) discussed mainland China in terms of three interrelated factors—political philosophy, culture, and population. Irene Taeuber also served as chairman of the session, which was organized by Vincent H. Whitney of the University of Pennsylvania.

VINCENT H. WHITNEY,
Program Chairman

American Statistical Association (K5)

The New York Area Chapter of the American Statistical Association and AAAS Section K jointly sponsored a program on hospital statistics in community planning, arranged by Monroe Lerner (Health Information Foundation, New York). Paul M. Densen, deputy commissioner of health, New York City, presided.

J. Douglas Colman (Associated Hospital Service of New York) described research opportunities in the use of data routinely collected for administra-

tive purposes by health agencies. Careful analysis of such data could provide answers to questions about comparative rates of hospital utilization, trends in the type and amount of hospital services, the impact of repeated admissions on hospital use, and so on. Such data are available at relatively little additional effort or cost from records or from already existing tabulations.

Paul Sheatsley (National Opinion Research Center, University of Chicago) discussed some methodological problems in a survey of the pattern of hospital use in Massachusetts. Interviews were conducted with 2500 patients (a sample of all admissions in the state over a 12-month period), with the physicians and hospital administrators involved, and with a sample of the general population. The purpose was to reconstruct the exact chain of events—physiological, socioeconomic, and psychological—leading to the decisions to hospitalize the patient and, subsequently, to discharge him from the hospital.

Monroe Lerner (Health Information Foundation) discussed some preliminary results of a survey comparing hospital utilization under Blue Cross in Indiana during 1956 and under a government insurance program in Saskatchewan during 1957. This survey was offered as an example of the use of already existing data. Hospital use was higher in Saskatchewan than in Indiana; this was especially true for obstetrical and respiratory cases, but was true to some extent for cases of all kinds.

Marta Frankel (New York City Department of Hospitals) described patterns of hospital utilization by the aged in New York City's municipal hospitals. The data were derived from administrative reports of individual hospitals and from patients' medical charts. The aged account for 18 percent of all patients discharged from these hospitals and for 35 percent of the hospital population in a randomly selected day. Diseases of the circulatory system constituted the most important cause of hospitalization in these patients.

MONROE LERNER, Program Arranger

The AAAS and the New York Area Chapter of the American Statistical Association held a joint session on "Some Statistical Problems in Social Insurance Research." Mortimer Spiegelman (Metropolitan Life Insurance Company) was chairman. Harry Malisoff (Brooklyn College) spoke on "Some invariant characteristics of unemployment in-

surance beneficiary experience"; David Robbins (Health Insurance Association of America), on "Some statistical problems in medical insurance programs"; A. Berman (New York State Labor Department), on "Selected studies in the field of workmen's compensation"; and A. J. Jaffe (Columbia University), on "The family and social insurance programs."

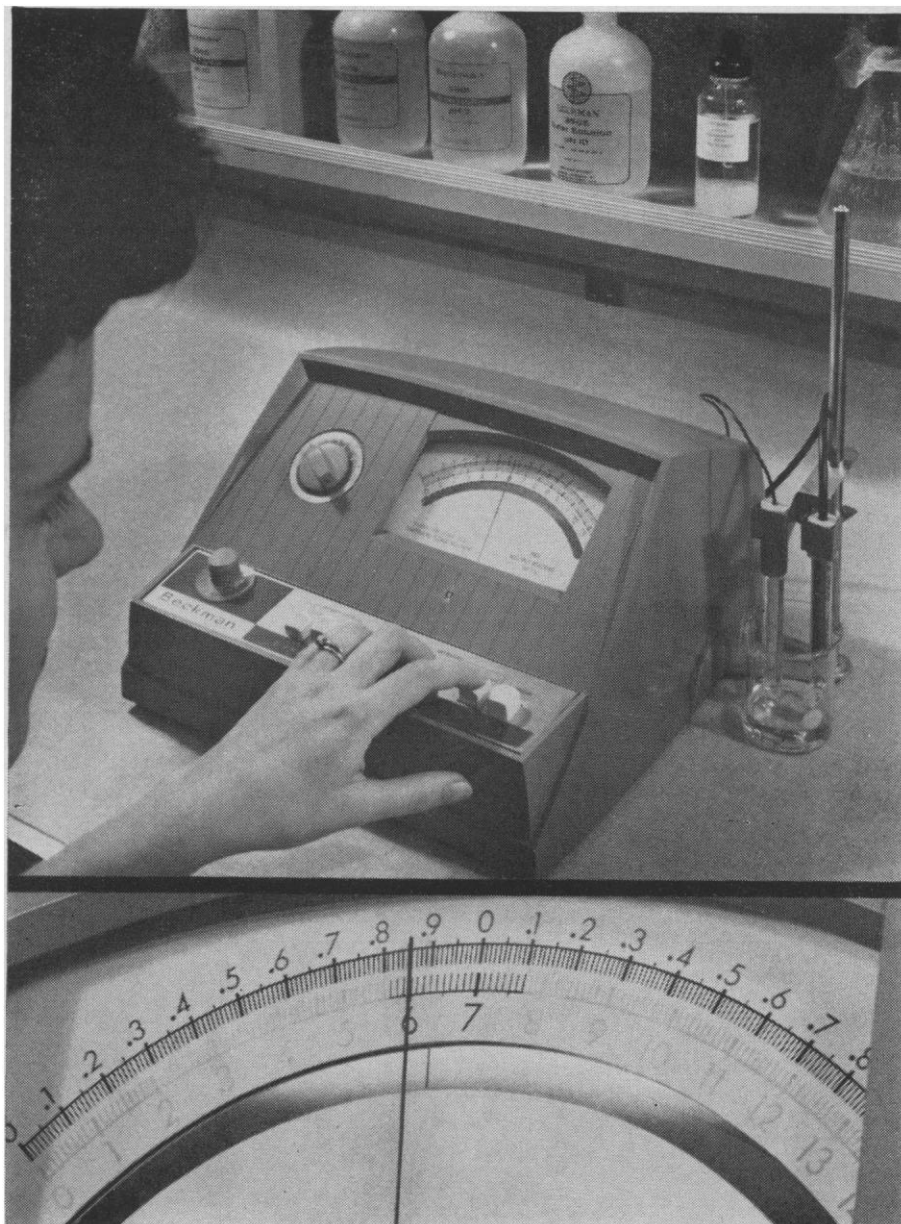
A. J. JAFFE, *Program Arranger*

Metric Association (K6)

The Metric Association held a symposium on 27 December, with J. T. Johnson, president of the association, as moderator and with the following participants: Lewis L. Strauss (former Secretary of Commerce), Carl F. Kayan (Columbia), Robert P. Fischelis (National Drug Trade Conference), and Karl E. Ettinger (research counselor, New York). Fred J. Helgren, secretary of the association, was unable to be present.

Strauss emphasized the importance of immediate consideration of the question of adopting the metric system. The following quotation gives the gist of his remarks: "Most of us in this room probably share the conviction that eventual change to the metric system is inevitable, and if inevitable, then most of us would wish this to occur before we have suffered more severely in our relationship with metric system countries than today has been the case, this in spite of the fact that we are aware that the change will be expensive and, in instances, difficult. We are fortunate in having a very able and distinguished scientist as Director of the National Bureau of Standards, Dr. Allen Astin. Dr. Astin has assigned Dr. A. T. McPherson, his Associate Director, the responsibility of conducting studies on the problem of conversion. The Bureau expects to explore the progress realized in Japan and India and the problems encountered in transfer to the metric system by those great populations."

The luncheon was attended by 15 of the 30 members present for a business session. A group was organized to act as an interim committee of trustees to organize the Metric Association for new and wider activities, international in scope, during the next two months. Members of this committee are as follows: Robert P. Fischelis (Washington, D.C.), chairman; Carl F. Kayan (New York City); Frank Y. Speight (American Society for Testing Materials, Phil-



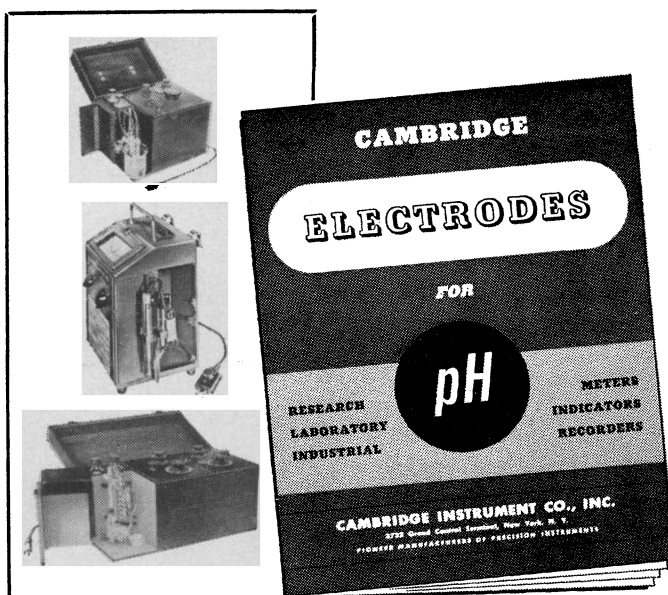
Expand ANY 2 pH span full scale

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 ± 0.02 pH or ± 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 38-7-01. **Beckman**

Scientific and Process Instruments Division
Beckman Instruments, Inc.
Fullerton, California



SEND FOR

FREE BULLETIN No. 912

Three models of Cambridge pH Meters, as well as the single and multi-point Recorders, are available for a wide variety of Chemical, Industrial and Medical applications. The electrodes designed for use with these high accuracy instruments are described in Bulletin #912.

CAMBRIDGE INSTRUMENT CO., INC.

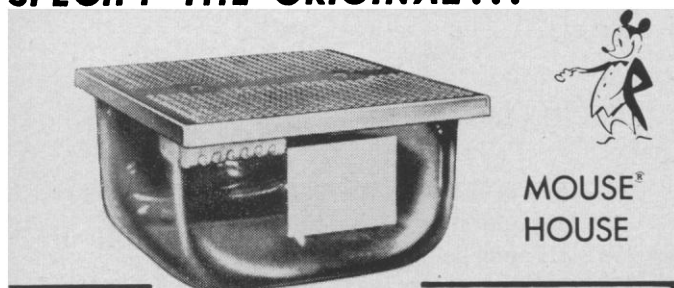
1681 Graybar Bldg., 420 Lex. Ave., N.Y. 17, N.Y.

PIONEER MANUFACTURERS OF PRECISION INSTRUMENTS

FOR THE VERY BEST

ACRYLIC ANIMAL CAGES

SPECIFY THE ORIGINAL...



Keystone acrylic plastic animal cages provide the cleanest, safest and lowest over-all cost for any type of laboratory housing. To keep abreast of developments in the field - our experts who pioneered the use of plastic animal caging - are constantly designing and building standard and highly specialized models.

Request your copy of Catalog S and submit your problems to

KEYSTONE PLASTICS CO.

Specialists in Scientific Plastic Processing
701 PAINTER STREET, MEDIA, PENNSYLVANIA

SIGNIFICANT BOOKS

for student
and professional use



PRINCIPLES OF RADIOISOTOPE METHODOLOGY

Grafton D. Chase, Philadelphia College Of Pharmacy and Science
Extensive descriptive and supplementary material has been correlated with detailed experimental procedures which makes this book especially useful in teaching and permits its use as both a text and laboratory manual.

cloth bound 1959 294 pp. \$6.00

BEHAVIOR OF ENZYME SYSTEMS: AN ANALYSIS OF KINETICS AND MECHANISM

John M. Reiner, Emory University

Specifically for people whose mathematical training is weak, this book covers the standard material of enzyme kinetics and includes much original material as well. The basic assumptions of every part of the theory are definitely stated and critically discussed. Stress is placed on using the theory to detect enzymatic mechanisms.

cloth bound 1959 329 pp. \$6.50

MANOMETRIC TECHNIQUES

Wayne W. Umbreit, Rutgers University

R. H. Burris and J. F. Stauffer, University of Wisconsin

In addition to a thorough coverage of the theory and practical application of manometric techniques, numerous supplementary methods are described. These include chemical, radio-isotopic and electrometric methods, the Thunberg technique and the preparation of tissues, homogenates and particulate fractions from cells. Valuable chapters on spectrophotometry and chromatography appear.

cloth bound 1957 342 pp. \$6.50

METABOLIC MAPS, Volume II

Wayne W. Umbreit, Rutgers University

These maps present at a glance experimental information about the reactions which occur in living cells. For both the advanced research worker and the student, this book will promote the understanding of metabolic pathways.

cloth bound 1960 287 pp. \$5.50

order from

BURGESS PUBLISHING CO.

426 South 6th Street • Minneapolis 15, Minn.



**Curtiss-Wright Model 802
Versatile 23 Range Portable
Universal Recorder**



CURTISS-WRIGHT

Princeton Division • Princeton, New Jersey

Physiologists
Neurologists
Biologists
Biophysicists
Biochemists...

General
Electric
to support
investigations
in new
field of
BIONICS

The new concept of utilizing biological techniques to advance electronic design will be the subject of concentrated study at G.E.'s Advanced Electronics Center at Cornell University. A new group is now forming to conduct research on animal systems (to determine their capabilities and limitations and devise a new methodology leading to the development of superior electronic equipment and systems in such areas as sensing communication, information storage, retrieval and others).

Several openings are available for men with PhD degrees or equivalent in one of the life sciences, and a background of mathematics. A strong interest in the "how" of organic systems is essential.

Qualified applicants are invited to write in strict confidence to Mr. George Travers, Dept. 74-WG

Advanced Electronics Center
at Cornell University

Light Military Electronics Dept.
A Department of the
Defense Electronics Division

GENERAL  ELECTRIC
Ithaca, New York

Additional openings are available for engineers and scientists in forward areas of RADAR, INFRARED, DATA PROCESSING & COMMUNICATIONS, HUMAN FACTORS ENGINEERING, ELECTRONIC COUNTER-MEASURES, MICROMINIATURIZATION, SATELLITE & MISSILE ELECTRONICS.

adelphia); Floyd W. Hough (Committee for Study of Metric System under Auspices of American Geophysical Union); and Karl E. Ettinger.

J. T. JOHNSON, *President*

National Academy of Economics and
Political Science (K7)

The National Academy of Economics and Political Science, with the collaboration of the national social science honor society Pi Gamma Mu, presented a program on "The Research Revolution and Public Policy." Leonard S. Silk, author of the recent book, *The Research Revolution*, presented a paper on "The research revolution and its economic implications," and Jacob Perlman of the National Science Foundation contributed one on "Public policy and the inter-sectoral flow of funds for research and development in the United States."

In his analysis of the growth of our economic system, Silk related the easing of the pains of technological change to further scientific and technological progress. After stating that "the present situation, in which international military and political conflict also involve a race for scientific and technological supremacy, has made the formulation of science policy one of the major public issues of our time," Perlman outlined the results of a program of surveys of expenditures and manpower involved "in basic and applied research and development throughout the economy"—surveys which he and his associates at the National Science Foundation made in order to provide the data essential to the formulation of science policy.

John C. Green, director of the Office of Technical Services of the U.S. Department of Commerce, presided and, through his practical experience and services of many years, contributed ably to the discussion. The two papers were exceptionally well received, and the academy plans to give them the widest possible distribution.

AMOS E. TAYLOR, *Chairman*

History of Science Society (L2)

The History of Science Society had a successful and well-attended meeting. The highest honor of the society, its Sarton medal, was presented to Owsei Temkin, professor of the history of medicine, Johns Hopkins. The Schuman prize, given for the best published book in the field, went to Mar-

Pabst
Laboratories

DIVISION OF PABST BREWING COMPANY

Presents the new
PRICE LIST
for 1961

with a complete line of
nucleotides, coenzymes
and related compounds

Do you need any of the
following highly purified
products in your re-
searches?

CDP
CTP
CYTOSINE
DPNH
GDP
GTP
IMP
ITP
RNA
URIDINE
UDP
UDPG
UTP

If so, you will be pleased
to find important price re-
ductions (with no sacrifice
of purity) in our 1961
PRICE LIST

Pabst Laboratories
DIVISION OF PABST BREWING CO.

1037 W. McKinley Ave.
Milwaukee 5, Wisconsin

WORLD LEADER IN COENZYME-A

shall Clagett (University of Wisconsin) for his book *The Science of Mechanics in the Middle Ages* (University of Wisconsin Press, 1959), and the Pfizer prize was awarded to Harold L. Burstyn, a graduate student at Harvard, for his research on Galileo, which is to be published in a forthcoming number of *Isis*.

In his address as outgoing president, Henry Guerlac stated that professional emphasis on the history of science had increased enormously during his period of office. The society now has a

central core of university teachers of the subject, as well as a band of distinguished amateurs. I. Bernard Cohen (Harvard) was elected president for the current term of office. A special feature of the meeting was the first George Sarton Memorial Lecture, delivered before the AAAS by Rene Dubos of Rockefeller Institute. It was a noteworthy beginning for a series that will undoubtedly prove to be one of the major attractions at future AAAS meetings.

Two of the sessions of contributed

papers deserve special mention. One, on the sociology, psychology, and economics of science, with papers from Bernard Barber, Karl Deutsch, and Anne Roe, was something of an innovation and displayed how important these interdisciplinary areas are for the historian of science. It is hoped that the proceedings of this session may be published in their entirety. A second innovation for the society was a session comprised of 15-minute papers on work in progress. This was most successful and gave the members an opportunity to hear from a large number of their younger colleagues, and from several projects whose final results will not be available for some time.

Unfortunately Anne Roe and Martin Dyck were unable to attend because of illness. Dr. Roe's paper was read for her by Mr. Mendelsohn, of Harvard University.

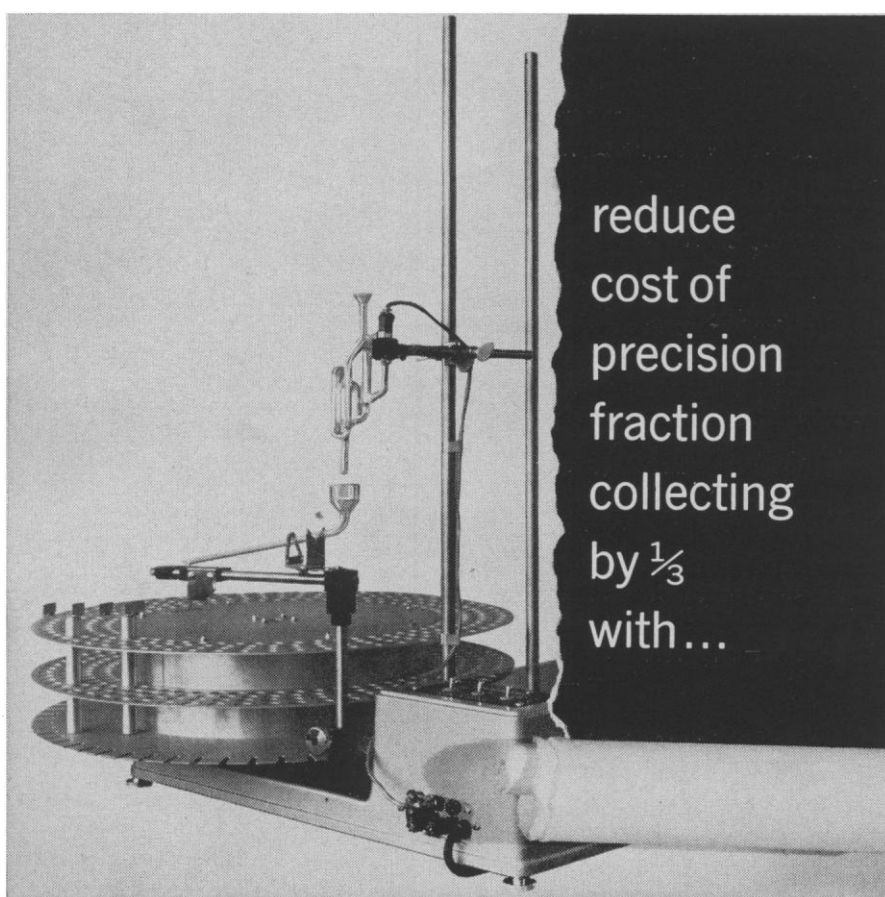
DEREK J. DE SOLLA PRICE,
Program Chairman

Society for the History of Technology (L5)

Emphasis upon technology as a causative factor in historical development and upon the sociological and scientific interrelations of technological change marked the third annual program of the Society for the History of Technology.

In a joint session with the American Historical Association on the topic "Technology as Cause in History," Roger Burlingame pointed out that technology is a "neglected clue to historical change," for historians have written of wars, economic theory, explorations, and the like, without expounding on the technological developments which lay at the foundation of the historical events. As counterpoint to Burlingame's thesis, Lewis Mumford claimed that history was a "neglected clue to technological change," for the historian of technology must open his eyes to the whole cultural milieu in order to understand technical change. Mervin J. Kelly, retired president of the Bell Telephone Laboratories, presided over this session, and H. Stuart Hughes (Harvard) commented on the papers of Burlingame and Mumford, indicating that the history of technology is not merely a specialized area of history of technology but is itself a way of understanding the past.

Papers on the development of automation, by John Diebold (industrial consultant, New York) and by James R. Bright (Harvard Graduate School



AUTOMATIC FRACTION COLLECTOR

Interchangeability features in the RSCo equipment offer sharp cost reductions in reliable and versatile fraction collection. With this one fraction collector you may use any of the three common techniques when you need them. • The basic unit provides volumetric siphoning. A plug-in control, obtainable at any time, permits timed flow. Another does drop counting. • Highly precise controls give consistent results. Continuous runs of up to 500 fractions are possible in small space. A variety of accessories provide many refinements. • Write for details on other practical features.



DEPT. A
RESEARCH SPECIALTIES CO.

200 SOUTH GARRARD BLVD. RICHMOND, CALIFORNIA

Tools of the Astronomer

*By G. R. Miczaika
and William M. Sinton*

This book is a thorough discussion of modern astronomical instruments that will be useful not only to the student of astronomy but also to both the practicing professional and the serious amateur. Illustrated. Harvard Books on Astronomy. \$7.75

Sourcebook in Astronomy: 1900-1950

Edited by Harlow Shapley

Sixty-nine non-mathematical selections from the work of such scientists as Albert Einstein, Sir Arthur S. Eddington, Henry Norris Russell, and Otto Struve discuss the basic theories of relativity, the building of the Palomar telescope, the discovery of neutral hydrogen, and other essential developments that have altered our view of the universe. Illustrated. \$10.00

Field Emission and Field Ionization

By Robert Gomer

This is the first study to offer a concise introduction to field emission and ionization including field-ion microscopy. Its emphasis is on the physical rather than theoretical aspects, employing simple mathematics. A practical tool for students and workers in field emission, the book offers a variety of applications and extensive references. Harvard Monographs in Applied Science, 9. Illustrated \$6.75

Heathland Ecology

By C. P. Friedlander

Written for the young biology student, this study offers a clear analysis of the specific field in such a way as to further an understanding of basic principles. \$1.75

Elihu Thomson, Beloved Scientist

By D. O. Woodbury

Thomson was true pioneer of the electrical age. Mr. Woodbury's book is more than personal biography; it is an exciting story of discovery in the area of Edison, Westinghouse, Marconi. \$6.00

Galileo in China

*By Pasquale M. D'Elia, S.J.;
translated and revised by
Rufus Suter and Mathew Sciascia*

Informative discussion and selected translations of unpublished Chinese sources describing the Jesuit's use of Galileo's discoveries in the East. Introduction by Donald H. Menzel. Illustrated. \$4.00



**READS
EASIER**



**USES LESS
MERCURY**



**PANEL OR
PORTABLE
MOUNT**



**SEPARATE
CAPILLARIES**



**2 SCALES
150 mm to 2 mm
2,000 μ to 1 μ**



**ACCURATE
LIGHT IN WEIGHT
COMPACT**

The KINNEY McLeod Gage answers the many objections to other gages now in use. Its advanced design compacts superior performance into a rugged, versatile instrument that may be permanently mounted on bracket, tank, panel or pipe or, by affixing demountable legs, used as a portable unit.

The KINNEY McLeod Gage covers a broad range of pressures . . . accurate readings from 150 mm Hg to 1 Micron Hg. This exceptional range of pressure readings is achieved by incorporating two separate capillaries having separate compression ratios, making available measurements of 150 mm to 2 mm and 2,000 microns to 1 micron. Unlike other McLeod Gages, the reading capillary tubes are completely separate and replaceable—easily detached from the main body at the knurled sealing glands. Because these tubes are reproducible, complete accuracy between each gage is assured.

The KINNEY McLeod Gage requires less mercury and it is supremely simple to add mercury, remove it for cleaning or recharge the gage. Operation requires no special skill . . . readings are achieved quickly, easily and confidently. Write for full information and prices today.

Get all the facts on the NEW KINNEY McLEOD GAGE. Write today!

**KINNEY VACUUM DIVISION
THE NEW YORK AIR BRAKE COMPANY**

353BB WASHINGTON STREET • BOSTON 30 • MASS.

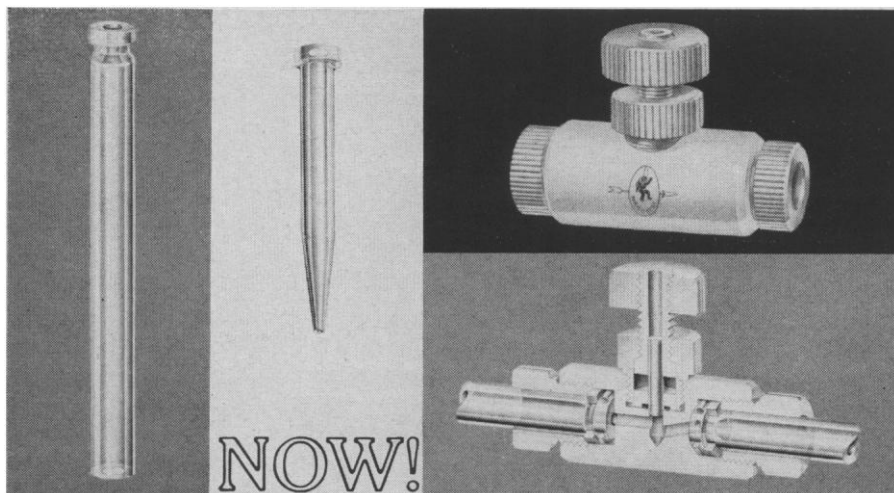
Please send me Bulletin No. 3821.1 and prices on the KINNEY McLeod Gage.

Name _____

Company _____

Address _____

City _____ State _____



Teflon* Needle Valves** with Rubber "O" Rings control flow of corrosive fluids—even under high vacuum!

At last, a needle valve that solves the problem of delicate control of flow of highly corrosive fluids, even under high vacuum! No chance of breakage or contamination—fluids touch only acid-and-alkali-resistant glass, teflon, and diamonite***!

Developed by the Manostat Corporation, this new needle valve incorporates 4 important improvements over previously available valves.

- 1 All plastic parts not in contact with fluid are made from highly corrosion resistant polypropylene that will withstand autoclaving temperatures.
- 2 Rubber "O" rings, situated so as not to come in contact with the fluid, assure high vacuum seals from the surroundings
- 3 Connecting tubes are of heavy wall pyrex brand glass for added mechanical strength.
- 4 Needle is a sintered synthetic ruby—diamonite—stronger and more corrosion resistant than glass, especially against strong alkali.

PRICE LIST

Cat. No. 610428T—Teflon Needle Valve ready for use with directions but no glass parts. 6.95

Cat. No. 610428A—Glass connecting tube.55

Cat. No. 63118C—Buret tip..70

*Trade name for DuPont Polytetrafluorethylene
***Patent applied for ***Trade name for sintered corundum

The EMIL GREINER Co.

Dept. 427, 20-26 N. Moore St. N. Y. 13, N. Y.

**USED AND APPROVED
BY LEADING UNIVERSITIES!**

Model RV-6
**6-INCH
DYNASCOPE**

Reflecting Telescope

includes these features:

- Electric Drive
- Rotating Tube
- Setting Circles

**ONLY
\$194.95**

F.O.B. Hartford
Shipping Wt.
50 lbs. Express
charges collect

**Easy Terms
Available!**

Completely
Portable!
Entire telescope
dismantles in
minutes for
easy carrying.

Finest American-made 6-inch reflector in its price range! Save \$100 or more, yet get all these fine features. f/8 6-inch mirror accurate to 1/8 wave • 3 matched eyepieces (75X, 150X, 343X) • 6x30 Achromatic finderscope • Heavy duty mount with setting circles • Rack & Pinion eyepiece holder • Sturdy lightweight tripod.

CRITERION MANUFACTURING COMPANY
Dept. DSM-13, 331 Church St., Hartford 1, Conn.

—FREE FACTS! MAIL COUPON!—

Criterion Manufacturing Company
Dept. DSM-13, 331 Church St., Hartford 1, Conn.
☐ Under your unconditional guarantee, please ship me promptly the RV-6 DYNASCOPE. My payment of \$194.95 is enclosed.
☐ Please send FREE LITERATURE on the RV-6 Dynascope and your other DYNASCOPES priced as low as \$49.95.

Name _____
Address _____
City _____ State _____

**Instant Controlled
Thorough Mixing**
In Tubes of Many Sizes
With the
VORTEX MIXER

4 Tube Model Showing Use
With Different Size Tubes

- SIMPLE TO OPERATE
- ELIMINATES HAND MIXING
- SAVES TIME
- INCREASES ACCURACY

Individual 3-speed control for each tube. Simple one-hand insertion or removal of tubes. Eliminates stoppers, rods, or finger capping. Accommodates tubes up to 25 mm. diameter, up to 200 mm. long.

ADAPTABLE TO ANY MIXING PROCEDURE
IN TEST TUBES
OR CENTRIFUGE TUBES

Ask your laboratory supply
dealer for details, or write
directly to:

**Scientific
Industries, Inc.**
Dept. 5-2, 15 Park St.
Springfield 3, Mass.

of Business Administration), led to a spirited discussion on the impact of automation on society. A. J. Jaffe (Columbia) stimulated the discussion by his trenchant commentary on the prepared papers. Preston R. Bassett (former president of the Sperry Gyroscope Corporation) served as chairman of this session held jointly with AAAS sections L and M.

Another highlight of the meeting was the day-long symposium on "Patents and the Advancement of Knowledge," an outgrowth of the controversy on inventing and patenting which appeared in a recent issue of *Technology and Culture* (Summer 1960). In this session, cosponsored by the society and by Section L, there was sharp criticism as well as strong defense of the existing patent system as a factor in the advancement of knowledge. J. William Hinkley (Research Corporation) presided over the first part of the symposium, in which Jacob Rabinow (Rabinow Engineering Company), Richard P. McGrail (American Cancer Society), and Johan Bjorksten (American Institute of Chemists) gave papers on various aspects of this subject.

Because of illness, Harry Woolf's scheduled vice-presidential address on "The evils of secrecy" was not given; an additional symposium panel was substituted, in which Melvin Kranzberg, editor-in-chief of *Technology and Culture*, introduced S. Colum Gilfillan (research sociologist) and I. Jordan Kunik (patent attorney, New York), who presented statements of their positions in the original controversy.

Robert L. Johnson (Temple) presided over the final session of the symposium, wherein Fritz Machlup (Princeton) and Charles C. Price (University of Pennsylvania) presented papers dealing with the economic and scientific incentives of the patent system. Rudolph F. Bannow (National Association of Manufacturers) introduced Robert C. Watson, who concluded the symposium by summing up some of his personal experiences as head of the U.S. Patent Office.

In a session on 19th-century technology, held jointly with AAAS sections L and M and presided over by Sidney Withington, Arnold R. Daum (Loyola) presented some new evaluations in the history of the petroleum industry and Thomas P. Hughes (Washington and Lee) indicated that the lag in the British electrical industry during the period 1882 to 1888 was caused by factors more complex than the legislation of

1882, to which it is customarily attributed. Bern Dibner of the Burndy Library commented on the papers.

A session held jointly with the History of Science Society featured a paper by Alexander M. Ospovat (University of North Dakota), on "Abraham Gottlieb Werner's ideas on science and education," and one by Harold I. Sharlin (Polytechnic Institute of Brooklyn), on "The engineering gap between Faraday's discovery of electro-magnetic induction and the electric dynamo."

Despite its formidable title—"Eilmer of Malmesbury: An eleventh-century aviator, a case study of technological innovation, its context and tradition"—Lynn White's presidential address enlivened the annual luncheon of the society. In a truly virtuoso performance, with wit and erudition, White showed how technological error persists despite the records of human experience. This luncheon was the capstone of this third annual meeting—a meeting which demonstrated the vast range of interests of this interdisciplinary organization, the advantages to be derived from bringing together the academician and the practicing technologist, and the vitality of this young and fast-growing society.

MELVIN KRANZBERG, *Secretary*

Nuclear Engineering

Nuclear engineering and its role in the engineering curriculum were the subjects of a panel discussion arranged by Section B (Physics) and Section M (Engineering) and held at the Biltmore Hotel, New York, on the morning of 30 December. John W. Healy (General Electric Company, New York) presided over a spirited discussion among the four panel members—Thomas B. Drew (Columbia), Irving Kaplan (Massachusetts Institute of Technology), John Lamarsh (Cornell), and V. Lawrence Parsegian (Rensselaer Polytechnic).

Nuclear engineering was generally defined as the branch of engineering involved with nuclear processes, and the nuclear engineer, as one with over-all competence in these processes. There was a difference of opinion among the panel members as to the distinction between nuclear engineering curricula and curricula of scope and depth in physics and in chemical, mechanical, and metallurgical engineering, particularly at the undergraduate level. In the graduate area, departments of nuclear engineering have a definite field of usefulness.

CLARENCE E. DAVIES, *Chairman*

17 FEBRUARY 1961



ONLY LOURDES

OFFERS GREATEST SELECTION OF
SUPERSPEED CENTRIFUGES
EXACTLY SUITED TO YOUR NEEDS!

RCF to 68,000 x G. • Most efficient Refrigeration System
Automatic rotor acceleration • Electric Braking
Superspeed vacuum centrifugation • Simplest
Continuous Flow System • Unsurpassed
capacity

Select from the industry's widest line of superspeed
centrifuges, rotors and accessories.



SOME OF THE MOST POPULAR LOURDES MODELS

	VA-2	LRA	LCA-1	LCM-1	AA-C	AX
RCF x G	68,000	30,000	36,900	36,900	34,800	34,800
Maximum RPM.	20,000	15,700	17,500	17,500	17,000	16,500
Maximum capacity	3,300 ml.	3,300 ml.	1,620 ml.	2,000 ml.	800 ml.	400 ml.
Rated Hp.	1 Hp.	1 Hp.	½ Hp.	½ Hp.	½ Hp.	½ Hp.
Automatic Acceler.	•	•	•	—	—	—
Electric Brake	•	•	•	—	—	—
Refrigeration	•	•	—	—	—	—
Safety Guard	•	•	•	•	•	—
Automatic Centering	•	•	•	•	•	•
Contin. Flow Accom.	—	•	•	•	•	—
Safety Relay	•	•	•	•	—	—
1 Year Warranty	•	•	•	•	•	•
Price (without rotors)	\$3,990	\$2,170	\$710	\$540	\$390	\$265

Mail coupon for complete line catalog

LOURDES INSTRUMENT CORP.

Division of Labline, Inc.
656 Montauk Avenue
Brooklyn 8, N. Y.

SC-217
Please send me your latest catalog.

Name _____
Title _____
Firm or Institution _____
Address _____
City _____ Zone _____ State _____

CLASSIFY LABORATORY QUANTITIES

for product or new
material research

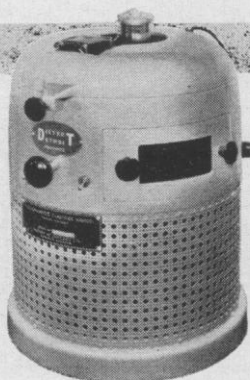
DETERMINE PARTICLE SIZE DISTRIBUTION

below 60 microns . . . in materials such as:

Beryllium Powder	Grinding Sand
Catalyst	Metal Oxides
Ceramic Powders	Penicillin
Chemicals	Polymers
Diatomaceous Earth	Powdered Metals
Drugs	Milk Solids
Dry Powders	Standard Dust
Fly Ash	Samples

with the
DIETERT-DETROIT
(BAHCO)
**MICRO-PARTICLE
CLASSIFIER**

Model
No. 6000,
totally
enclosed
220 volt,
3 phase
motor,
operates at
3500 rpm.



Widely used for particle size control in many industrial processes . . . for scientific study of fine materials . . . for pre-testing dust collector needs . . . for determining the separating efficiency of air cleaners. An 8-fraction analysis can be completed at the rate of 15 minutes per fraction by unskilled operators. Fractions are precisely defined and may be retained for accurate study.

HARRY W. DIETERT CO.
CONTROL EQUIPMENT

9330 ROSELAWN DETROIT 4, MICHIGAN

Send me 8-page Micro-Particle Classifier bulletin.

Name _____
Company _____
Address _____
City _____ State _____

Medical Sciences (Section N)

Section N held its annual symposium, organized along the conventional lines of an interdisciplinary discussion, from 26 to 29 December. The subject of the symposium, arranged by Abraham M. Shanes, was "Biophysics of Physiological and Pharmacological Actions." There were five half-day sessions.

The first session covered elementary systems. The chairman of this session was T. Shedlovsky (Rockefeller Institute). J. F. Hoffman reviewed the use of red-cell ghosts in studying transport phenomena. Robert L. Post (Vanderbilt) presented a very interesting concept of the relationship of adenosine triphosphatase activity to red-cell permeability. Existing relationships between this adenosine triphosphatase and the sodium pump were discussed. T. Hoshiko gave a lucid description of electrogenesis in frog skin. He emphasized that the transport mechanism for sodium is located at the corium facing membrane of the epithelial cell. S. Dikstein, of Jerusalem, presented evidence to show that model systems employing monomolecular layers of lipids gave characteristic actions of drugs that could be studied in relationship to the spatial distribution of functional groups. It will be interesting to follow the development of this approach to the mechanism of drug action.

The second session, which was concerned primarily with nerve, opened with a paper by J. D. Robertson (McLean Hospital, Boston). The current knowledge of intimate nerve structure as determined by electron-microscopic techniques was presented. In three papers which followed, the characteristics of the resting nerve cell, the theories of spike generation, and the current concepts of afterpotentials were reviewed and discussed. Of particular interest was the point made by F. A. Dodge, that the reduction of calcium and small depolarizations cause similar membrane changes. Very interesting evidence was presented by K. Kotetsu (University of Illinois) that sodium is dispensable for membrane excitation in certain excitable tissues. This complicates interpretation of many of the currently held concepts in this field.

The third session was concerned with a discussion of muscle. After presentation of the classical concepts of the properties of striated muscle, discussions on electrochemistry, the coupling of excitation and contraction, and the modification of action potentials were

OXFORD BOOKS

OF EXCEPTIONAL INTEREST

RIVAL THEORIES OF COSMOLOGY

A Symposium and Discussion of Modern Theories of the Structure of the Universe

By H. BONDI, W. B. BONNOR, R. A. LYTTLETON and G. J. WHITROW. The carefully revised text of three B.B.C. talks and a number of superb photographs taken through the 200-inch Hale telescope on Mount Palomar provide for the general reader a fascinating introduction to current theories concerning the universe. 12 pages of half-tones; 2 pages text figures. \$2.25

LARGE ELASTIC DEFORMATIONS

And Non-linear Continuum Mechanics

By ALBERT EDWARD GREEN and JOHN EDWARD ADKINS. A systematic exposition of some of the main topics in the non-linear theory of large elastic deformations, written for the advanced mathematician. Elastic theory is also linked naturally with experiments on rubber and with general non-linear continuum theories. \$8.80

MAN, RACE AND DARWIN

Papers read at a Joint Conference of the Royal Anthropological Institute of Great Britain and Ireland and the Institute of Race Relations

Introduction by PHILIP MASON. Papers dealing with man's knowledge of the physical and cultural differences between various human populations and how man's changing thoughts on the subject have affected human relations. \$2.90

ANATOMY OF THE MONOCOTYLEDONS

Volume 1: Gramineae

By DR. C. R. METCALFE. This volume, complete in itself, is devoted to the grass family, and discusses the general morphology as well as the histological details in grass classifications. It gives original descriptions of over 400 species belonging to 206 genera, and, with information from the literature, 345 genera are covered. 29 text figures. \$13.45

At all bookstores

OXFORD UNIVERSITY PRESS

417 Fifth Avenue, N.Y. 16

TROUBLE FREE **STUDENT MICROSCOPES**



CHICAGO, U.S.A.

**NEW DESIGN
 EXCLUSIVE
 SAFETY FEATURES
 MEDICAL QUALITY OPTICS**

**10X OCULAR
 OBJECTIVES**
 16mm (10X) N.A. 0.27
 4mm (44X) N.A. 0.66

**TRANSPORTATION
 INCLUDED**

*Write for catalogue
 listing safety features*

MODEL GB2A

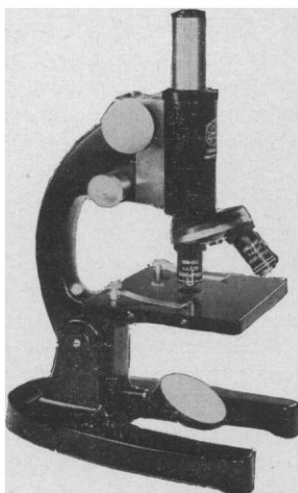
List price\$117.00 ea.

Quantities of 5 or more\$105.30 ea.

THE GRAF-APSCO CO.

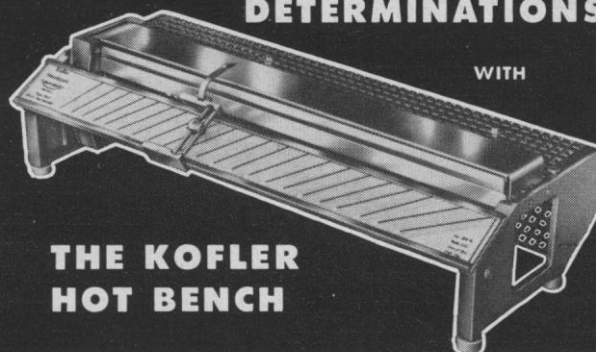
5868 BROADWAY

CHICAGO 40, ILL.



MELTING POINT DETERMINATIONS

WITH



THE KOFLER HOT BENCH

+50° to +260°C

Melting point determinations can be made rapidly, and with great accuracy. The temperature over the entire range can be read easily on a large scale. Calibrating crystals are supplied.

FEATURES:

- No thermometer is required.
- Accuracy $\pm 1^\circ$ Centigrade.
- Only minute samples are required.
- A test requires only one minute.
- Entire temperature range is spread out on the bench.

Complete Literature Available

C. H. STOELTING CO.

Analytical Balances • Strip Chart Recorders • Proportioning Pumps

Following Microscope Accessories:

Exposure Meters, Cameras, Micro-Projection—View Scope, Hot & Cooling Stage, High-Intensity Mercury Arc Lamps

424 NORTH HOMAN AVENUE, CHICAGO 24, ILLINOIS

PUMPS FOR PHYSIOLOGICAL RESEARCH

INFUSION-WITHDRAWAL PUMPS

All pumps in this group are operated by synchronous reversing motors and achieve the transfer of liquids by means of motor-driven mechanisms acting on standard Luer-Lok syringes. The syringe piston is attached to a weighted half-nut which rests on a precision-cut lead screw. As the screw turns, a very uniform intake or discharge of liquid takes place. Pre-set limit stops automatically stop pumping action.

Single, dual and multiple syringe models are available, ranging from simple types designed for either infusion or withdrawal to those performing both operations continuously and automatically over extended periods of time.

Both single and multi-speed models are available. The multi-speed pumps are equipped with a transmission which provides 12 separate speeds and 72 pumping rates using syringes from 50 to 2 cc. size. Single speed units deliver one fixed speed and 6 pumping rates using syringes in the same range of sizes. A range of motors from 1 to 1800 R.P.M. is available.

RESPIRATION PUMPS

These are motor-operated, positive displacement pumps for use with small mammals. Air or gas is drawn into a cylinder in one half of the cycle and delivered to the animal in the next half of the cycle. The stroke volume is adjustable mechanically from 30 to 750 cc. per stroke. A motor-operated slide valve provides separate ports for inspiration and expiration. The expired air may be collected or recycled at the slide valve.

Single and multi-speed models are available. In the latter, motor and speed control box produce rates continuously adjustable from 7 to 50 strokes per minute. The single speed model produces a fixed rate of 22 strokes per minute.

PERISTALTIC PUMPS

These are heavy-duty units achieving the continuous flow of liquids by means of peristaltic action on the outside of rubber tubing.

Catalog 1960-61 and Data Sheets are available on request.



HARVARD APPARATUS CO., INC.

(a non-profit organization)

Dover, Mass., U.S.A.

presented. Of particular interest was a paper by W. Freygang on work done in collaboration with R. H. Adrian, in which he discussed anomalous rectification in muscle fibers. C. Paul Bianchi presented information on the action of caffeine on muscle contraction. He showed that caffeine may act through an action on calcium influx, which can occur in the absence of depolarization. A. M. Shanes (National Institutes of Health), who presented work on slow fibers, confirmed the importance of calcium as perhaps the most intimate link between membrane phenomena and muscle contraction. This is an extension of his earlier work on twitch fibers.

In the fourth session, on the contractile properties of muscle, the authors of papers attempted to correlate structure and function, but quite clearly this is a field which needs much more concentrated effort before even tentative relationships are well established. This is in no way meant to indicate that great strides have not been made in the energetics of muscle contraction.

The fifth and final session was concerned with cardiac muscle and smooth muscle. Brian Hoffman summarized the recent evidence bearing on the question of whether heart muscle, functionally, should be thought of as a syncytium or a group of individual cells. He also re-

viewed at some length the differences and similarities between the properties of nodal fibers and those of cardiac muscle fibers. J. W. Woodbury discussed the cardiac action potential and indicated, on the basis of electrochemical evidence presented, that it seems unlikely that the repolarization phase can be entirely explained on the basis of the rate of potassium efflux from the depolarized tissue. Leon Hurwitz (Vanderbilt) reviewed the electrochemistry of smooth muscle and its relationship to contraction. He emphasized that the calcium ion appears to have a depressing action on smooth-muscle excitability but at the same time is essential for smooth-muscle contraction. It would therefore appear that in striated, cardiac, and smooth muscle, depolarization is associated with calcium influx. L. Barr (University of Michigan) presented evidence of the importance of potassium in the functional activity of arterial smooth-muscle strips. When dog carotid artery strips were stored at 4°, he found that sodium was gained and potassium was lost. The ability to respond to stimuli was also lost. As the potassium ion concentration increased, contractility and the rate of relaxation following a stimulus increased, yet an optimum K_1/K_0 was necessary for maximum excitability.

Although the title of the symposium included the "physiological and pharmacological actions," it was apparent from the papers presented that we are only now beginning to consider the pharmacological events at the cell membrane or in muscle tissue itself. It would appear that the more basic concepts of ion movement across cell membranes are reasonably well established. However, there is much to be learned before action potential, contraction of muscle, and so on can be thoroughly correlated with membrane activity. It would appear that pharmacological agents have been used less extensively than they might have been in the elaboration of mechanisms in these systems. The use of caffeine by Bianchi, cocaine by Shanes, and alcohol by Hurwitz indicates the valuable contributions of chemical agents employed as tools.

ALLAN D. BASS, *Secretary*

Expression of the Emotions in Man

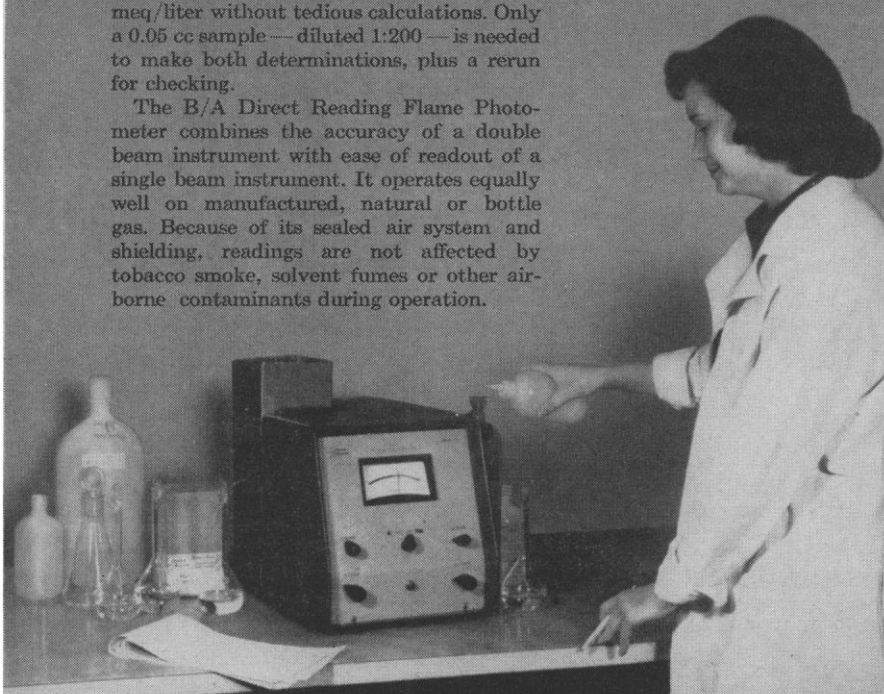
The symposium "Expression of the Emotions in Man," sponsored by the American Psychiatric Association and cosponsored by AAAS Section I (Psychology) and the American Psychoana-

Determine both Na and K in a single sample run

**Baird-Atomic Flame Photometer makes fast, precise
biological analyses reproducible to $\pm 0.5\%$**

With a flick of a switch—and from a single serum sample—the Baird-Atomic Flame Photometer shows both Na and K concentrations. Because determinations are made in one step, no time is wasted between runs in cleaning and recalibration. Results are read directly, instantaneously in meq/liter without tedious calculations. Only a 0.05 cc sample—diluted 1:200—is needed to make both determinations, plus a rerun for checking.

The B/A Direct Reading Flame Photometer combines the accuracy of a double beam instrument with ease of readout of a single beam instrument. It operates equally well on manufactured, natural or bottle gas. Because of its sealed air system and shielding, readings are not affected by tobacco smoke, solvent fumes or other airborne contaminants during operation.



Write today for more complete information.

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.





- Use of flexure strips which are not subject to wear or adjustment eliminates lateral excursion of specimen along knife edge.
- Provides extreme reproducibility of specimen path perpendicular to knife edge.
- Gives uniform sections in uninterrupted sequences even though knife edge is curved or marred.
- Has no bearings or slides that affect section uniformity-specimen advance by thermal expansion.
- Proved ability to cut sections of less than 140 Å in thickness.
- Supplied complete with hand and motor drives for 3 variable cutting speeds, adjustable fluorescent illumination, adjustable binocular microscope and magnetically clamped knife holder.

Write for
complete
specifications

SCHUCO SCIENTIFIC
DIV. OF SCHUELER & COMPANY / 75 CLIFF ST. NEW YORK 38

BACTO-LATEX

0.81 MICRON

Product of

*Dow Research and
Difco Standardization*

- ¶ Bacto-Latex 0.81 micron is characterized by uniform particle size, batch reproducibility and biological inertness
- ¶ An inert carrier for use in clinical and investigational tests including

RHEUMATOID ARTHRITIS
INFLAMMATORY DISEASES
TRICHINOSIS
LEPTOSPIROSIS

- ¶ Recommended for Rheumatoid Arthritis Tests of Singer and Plotz and modifications.

Literature available on request

DIFCO LABORATORIES
DETROIT 1 MICHIGAN USA

BIOLOGICS CULTURE MEDIA
REAGENTS

DIFCO

HANDBOOK OF THERMOPHYSICAL PROPERTIES OF SOLID MATERIALS

Volume 1 Elements
Volume 2 Alloys
Volume 3 Ceramics

Volume 4 Cermets, Intermetallics, Polymeric and Composites
Volume 5 Reference List and Author Index, etc.

*Collected, evaluated and consolidated by Alexander Goldsmith,
Thomas E. Waterman, Harry J. Hirschhorn, Armour Research
Foundation, under the sponsorship of the U.S. Air Force.*

Materials covered include Elements, Alloys, Ceramics, Cermets, Intermetallics, Polymeric and Composite Materials. Except for materials in the last two categories, only those melting above 1000°F. are included.

Materials index major headings: I. Elements (Melting temperature above 1000°F). II. Iron Base Alloys. III. Copper Base Alloys. IV. Nickel Base, Cobalt Base, and Refractory Metal Base Alloys. V. Light Metal Alloys (Including Ti Alloys). VI. Other Metal Alloys. Melting temperature above 1000°F. VII. Ceramics (Including Glasses). VIII. Cermets. IX. Intermetallics. X. Polymeric Materials (Including Plastics). XI. Composite Materials.

Each of the four volumes of data consists of four sections arranged in the following order. 1. Introductory remarks and explanatory text. 2. Materials Index. 3. Tables of Conversion Factors. 4. Body of Data. The fifth volume, or Appendix consists of the following sections: 1. Introductory remarks and explanatory text. 2. Materials Index. 3. List of References. 4. Author Index (alphabetic). There is a *Materials Index* located in the front portion of each volume.

Each of the volumes is designed so that it will lend itself to the inclusion of new data as well as to the substitution of others. Additional data for inclusion in these volumes will be published when available.

Approx. \$100.00 per set



PERGAMON PRESS

122 EAST 55th STREET, NEW YORK 22, N.Y.

NEW YORK

OXFORD

LONDON

PARIS

Presenting
The WORLD'S FIRST
and ONLY
**DISPOSABLE
PLASTIC
MOUSE
* CAGES**

Will comfortably hold
up to 6 mice
... each cage approximately
11" L. x 8 3/4" W. x 5" H.



Tested and proved in
extensive laboratory tests

A new disposable mouse cage that does away with disagreeable sterilizing! Combines a nickel-plated steel top with a plastic, escape-proof disposable cage bottom. Constructed of a tough, new plastic which is inert and non-allergic. Now, priced so low that you use the cage bottom just once—then destroy! In fact, priced less than it costs to clean and maintain standard type cages.

Cages are transparent for continuous observation and suspended on cardboard supports for stability and free air circulation. Top is fully ventilated to maintain ambient temperatures . . . entire cage structure is assured gnaw-proof. Bottoms are designed to nest for compact stacking in minimum space . . . permit storage close to experiment area.

Cage bottom
and contents
burn completely

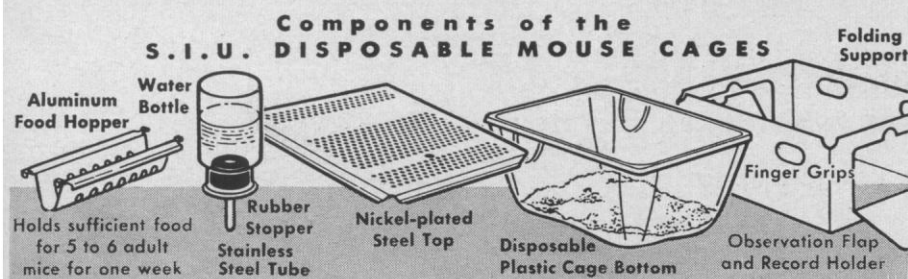


Developed by the Microbiology and
Design Departments of Southern
Illinois University, Carbondale, Illinois
*Foreign and Domestic Patents Pending

Order your SPECIAL TEST PACKAGE TODAY!
Only \$19.75 each

Sold only through these authorized distributors:

ALOE SCIENTIFIC
CANADIAN LABORATORY SUPPLIES, Ltd.
CHICAGO APPARATUS CO.
HARSHAW SCIENTIFIC
Division of The Harshaw Chemical Co.
SCIENTIFIC PRODUCTS
Division of American Hospital Supply Corp.
SCIENTIFIC SUPPLY CO.
Mail your order today!



lytic Association, centered around methods of study and psychological classification of certain emotional phenomena in the adult human being. A historically oriented introduction by P. H. Knapp, program chairman, stressed the need for convergence between biologic (particularly neurophysiologic) and psychologic (particularly psychoanalytic) advances in the study of emotional phenomena.

Papers by P. MacLean, on neurophysiologic interrelations between sexual, oral, and aggressive responses in the monkey and their progressive socialization during phylogenesis, and by Spitz, on the origins of emotional responses in infancy, continued the introductory theme. The symposium then focused on approaches to emotional expression within the evolutionary frame of reference by the use of newer media. A short film by F. Deutsch served to introduce discussion of the study of expressive manifestations at various levels—the lexical and linguistic, discussed by G. Mahl; the kinesic, discussed by R. Birdwhistell; and the visceral, discussed by J. Lacey, who brought forward the evidence of adaptive cardiovascular patterns facilitating intake or exclusion of environmental input.

In closing sessions K. Pribram discussed the neuropsychologic model which Freud had advanced in his *Project for a Scientific Psychology* as a sophisticated precursor of the type of unified model urged in the introductory presentation—a type which present-day communication theory is serving to elaborate. G. Engel discussed problems of classifying emotions. D. Hamburg, in a paper amplified by M. Mead, discussed evidence from contemporary primitive cultures, from historical anthropological investigations, and from animal studies, stressing the evolution of emotions and their adaptive role, particularly in forming social bonds.

PETER H. KNAPP, *Program Chairman*

Alpha Epsilon Delta (N1)

The symposium on "Career Opportunities in Medicine and Dentistry" co-sponsored by Sections C—Chemistry, F—Zoological Sciences, N—Medical Sciences, and Nd—Dentistry, attracted an attendance of about 200 persons, including premedical and pre dental advisers and students. An exceptional program featured W. H. Stewart, chief of public health methods, U.S. Depart-

ment of Health, Education, and Welfare, and director of the study staff of the surgeon general's consultant group on medical education, whose report "Physicians for a Growing America" was recently published. Stewart presented a cogent outline of the physician needs for the future. The need for dentists was outlined by Shailer Peterson, secretary, Council on Dental Education, American Dental Association, and assistant secretary of the Association for Educational Affairs, who works very closely with the Association of American Dental Colleges on these problems. A panel discussion on opportunities in dentistry was moderated by Raymond J. Nagle, dean, New York University College of Dentistry, while the panel on opportunities in medicine was moderated by James O. Pinkston, associate dean and professor of physiology, Downstate Medical Center, State University of New York, Brooklyn.

A wide variety of career opportunities in medicine and dentistry were brought out during the discussion and in the question-and-answer period that followed. After the luncheon, I. S. Ravdin, vice-president for medical affairs, University of Pennsylvania, discussed "The doctor's dilemma" in solving the numerous complex scientific, professional, and social problems facing the medical and dental professions today in providing health care for the American people. The afternoon was devoted to informal conferences with admissions officials in attendance and visits to the medical and dental schools in the city.

Tentative plans are under way to sponsor a similar program at the Denver AAAS meetings in December 1961.

MAURICE L. MOORE, *Secretary*

Dentistry (Section Nd)

In keeping with the general program scheme of recent years, Section Nd again organized a multidisciplinary symposium on a topic basic to oral biology—*fundamentals of keratinization*.

The two-session symposium, held at the Biltmore Hotel on 30 December, was organized under the direction of Earl O. Butcher (New York University School of Dentistry), with cosponsorship by Section N (Medicine), the International Association of Dental Research (North American Division),



Optically and mechanically, the M-5 offers unequalled precision, convenience and versatility for the most diverse research applications. Uniform, maximum sharpness throughout the field, with no change in accommodation, is one of the many exclusive features of the instrument.

With a constant working distance of 96 mm., standard magnifications are 6x, 12x, 25x, and 50x, conveniently selected on the rotatable horizontal drum. Using 8x, 10x, 15x, and 20x eyepieces and attachment objectives, a total power range of from 5x to 200x is obtainable. Accessories not illustrated include other wide field eyepieces, various light sources, stages and polarizing, photographic and measuring attachments.

Your own evaluation of this superb stereomicroscope will prove most rewarding. Write for Booklet M-5.

*the FIRST name in a complete line of Surveying Instruments, Photogrammetric Equipment and Microscopes.

WILD HEERBRUGG	WILD HEERBRUGG INSTRUMENTS, INC. PORT WASHINGTON, NEW YORK <i>Full Factory Services</i> In Canada: Wild of Canada Ltd., 157 MacLaren St., Ottawa, Ontario
---------------------------------	---

the American Dental Association, and the American College of Dentists.

During the morning session (moderated by Butcher, section program chairman), various aspects of keratinization were discussed: (i) sequential mechanisms involved (A. G. Matoltsy, University of Miami); (ii) distribution of SH and SS reactions in various vertebrate keratins (R. J. Barnett, Yale; R. F. Sognaes, University of California, Los Angeles; G. Pettengill, Harvard); (iii) tissue culture keratinization (G. Szabo, Harvard); (iv) ultrastructure of keratinizing tissues

(J. A. Rhodin and E. J. Reith, New York University); and (v) the effects of vitamin A on keratinizing tissues (H. A. Bern and D. J. Lawrence, University of California, Berkeley; J. P. Parnell and B. Sherman, State University of New York).

The afternoon session (moderated by Sognaes) began with a discussion of physical properties of cornified epithelium (I. H. Blank, Massachusetts General Hospital) and proceeded to deal with structural and chemical aspects of oral epithelial derivatives—keratinization of the oral mucosa (J.

Meyer and H. Medak, University of Illinois); keratin formation in dental cysts (J. J. Pindborg, Royal Dental College, Copenhagen); environmental and genetic effects on oral cornification (C. J. Witkof, Jr., National Institute of Dental Research); ultrastructural demonstration of the extracellular deposition of enamel (M. L. Watson, University of Rochester); and the microchemical constituents of the enamel protein (K. A. Piez, National Institute of Dental Research).

The symposium was well attended; at times the Biltmore Suite was filled to capacity (150), and there was a good deal of audience participation. During the morning session discussion centered around the definition of keratinization versus cornification, and the appropriateness of the classical terms "hard" and "soft" keratin. On the basis of the distribution of SH and SS reactions, a classification by site and origin was suggested as most appropriate by one discussant (Barnett). During the afternoon session discussion of the enamel protein resulted in rejection of the views that this curious epithelial product is either a typical keratin or a collagen. It arises extracellularly, unlike typical keratins, and it contains no hydroxyproline, unlike collagen. One discussant (Pautard, Leeds University) even suggested that the enamel matrix may resemble a silk protein in structure. This may have important implications with respect to concepts of calcification.

In addition to sponsoring its own program, Section Nd cosponsored a meeting on career opportunities in medicine and dentistry, arranged by Alpha Epsilon Delta, which attracted a large audience on the morning of 29 December in the music room of the Biltmore. After introductory remarks (C. V. Reichart, Providence College), two comprehensive reports were presented, on future needs for physicians (W. H. Stewart, U.S. Department of Health, Education, and Welfare) and future needs for dentists (S. Peterson, American Dental Association). The remainder of the morning was devoted to two panel discussions on challenges in store for physicians and dentists. The panel dealing with career opportunities in dentistry was moderated by R. Nagle (New York University College of Dentistry), with discussants from several Eastern dental schools—J. A. Cuttita (Columbia), M. M. Maxwell (Seton Hall), W. A. Wilson (Fairleigh Dickinson), J. H. Oaks (Harvard), L. W.

SUPER-COLD

with EXTRA-FAST PULL-DOWN TIME!

Forma FRIGID-MIDGET

The Super Cold Frigid-Midget has a cold walled, type 304 stainless steel inner work chamber, thus giving extremely fast pull-down time from ambient to -100°F in $1\frac{1}{4}$ hour . . . Air circulation is provided by fan, housed in separate compartment, covered with perforated grille for safety. Separate switch to cut off air circulation when lid is open.

Inner chamber entirely surrounded by $4\frac{1}{2}$ " low K factor insulation . . . Stryfoam used on exterior flat surfaces . . . Special glass wool around heat exchanger . . . Lid double gasketed with silicone rubber for tight seal to neoprene rubber top . . . Controls front-mounted . . . U.E.C. Hydraulic thermostat . . . Temperature Recorder. Dial Thermometer, Fan Switch, Line Switch and Pilot Light. Access panel for through electrical connections also on front of cabinet.

TEMPERATURE RANGE—

-100°F to ambient
(Other Ranges available)

OVERALL DIMENSIONS:

24" W. x 38" H.
23" F. to B.

INSIDE DIMENSIONS:

12" W. x $12\frac{3}{4}$ " H.
14" F. to B.

115 Volts

11 Amps

60 Cycles



ECONOMICAL

Capable of handling work normally done by far more costly equipment!

VERSATILE

So many uses, no laboratory can afford to be without a Frigid-Midget! These include the testing of electronic components, instruments, metal-aging, shrink fitting, tool fitting and countless other applications.

MOBILE

Special added features are its compactness and mobility.

Cat. No. S70493

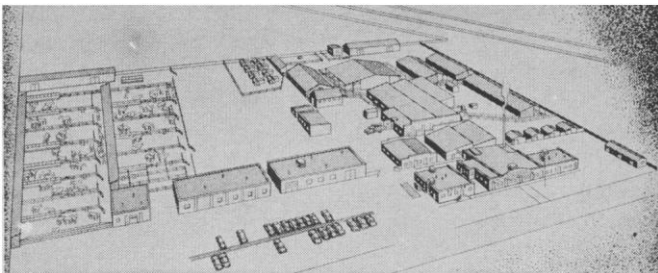
Each \$1600.00



STANDARD SCIENTIFIC
Supply Corp.

808 BROADWAY
NEW YORK 3, N. Y.

LABORATORY
APPARATUS
REAGENTS
AND
CHEMICALS



**Production experience
guarantees**

RELIABILITY

Order with confidence, the quality and dependability your laboratory and research needs demand. Prompt service. All correspondence and inquiries answered immediately.

- serums • bloods
- ultrafiltrates
- complement • globulins
- fluorescent materials
- diagnostic reagents
- tissue culture reagents

We maintain a variety of our own laboratory animals under the finest conditions.



Write for this FREE
CATALOG NOW!
No salesman
will call.

**COLORADO
SERUM CO.**

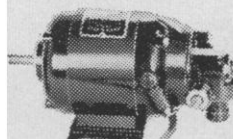


Laboratory and General Office **PEAK OF QUALITY**
4950 YORK STREET • DENVER 16, COLORADO • MAin 3-5373

HELLER ELECTRONIC VARIABLE-SPEED

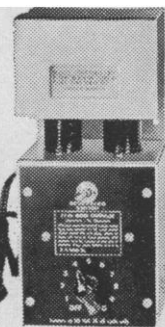
AC CONTROLLER and Matching DC MOTOR

2T60 ELECTRONIC CONTROLLER
with matching 1/50 H.P. DC MOTOR



\$87

Complete, F.O.B.,
Las Vegas,
Nevada



SPECIFICATIONS

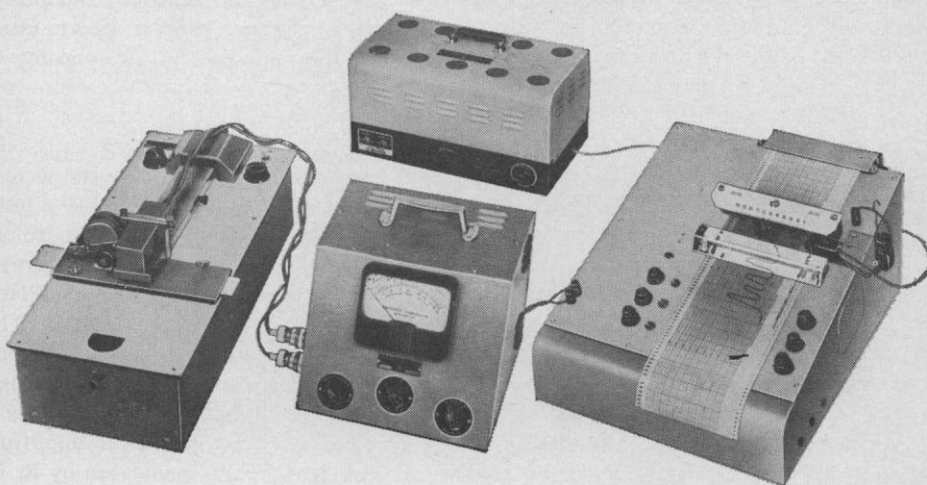
• Thyatron tube operated controller gives stepless operation • Input: 110-120 V., 60 cy. single phase • Output: 0-120 V., 200 ma. DC to armature • 1/50 H.P. ball bearing, right angle, gear head, shunt wound, DC motor • Reversible • Armature shaft is extended • Armature speed 0 to 4000 R.P.M. • Motors in gear ratios: 6, 18, 30, 36, 60, 100, 300, 540, and 1120:1 in stock.

Other models to
3/4 H.P. motors
available.
Request data.

GERALD K. HELLER CO.

2673 South Western Street, Las Vegas, Nevada, P.O. Box 4426

PHOTOVOLT DENSITOMETRIC EQUIPMENT for ELECTROPHORESIS and CHROMATOGRAPHY



New building-block system permits adding of units as required, from manual and semi-automatic operation to fully-automatic recording and integrating

• For scanning of electrophoresis strips and readings on large sheets in chromatography

• For work in visible and ultraviolet ranges

• For evaluation by color-transmission, reflection or fluorescence

• For readings on filter paper, agar, starch and other gels

Write for Bulletin 800-S to:

PHOTOVOLT CORPORATION

95 Madison Avenue • New York 16, N. Y.

COMPLETELY NEW • PRECISION • MICRO-SEROLOGICAL BATH

Just
What
The
DOCTOR
Ordered!



A dependable new micro-bath that can be carried anywhere for on-the-spot tests and analyses . . . just right for bedside blood pH . . . 37°C. incubations . . . 56°C. inactivations . . . any clinical or research function requiring guaranteed uniformity . . . wide operating range . . . utmost convenience.

Small size . . . no sacrifice of Quality . . . all the features that guarantee years of satisfactory performance.

- **Wide Operating Range**—ambient to 100°C.
- **Guaranteed Uniformity**— $\pm 0.2^\circ\text{C}$. or better at any temperature setting.
- **Accurate Temperature Control**—Sensitive ($\pm 0.1^\circ\text{C}$.) thermostat controls temperature throughout entire range.
- **Repeatable Settings**—Heat control knob and reference dial for 100% repeatability.
- **Double Wall Stainless Steel Construction**—Seamless interior shell, smooth, impervious, easily cleaned.
- **New Universal Rack**—Holds various size tubes, jars, flasks simultaneously.

Compact; 7" wide, 6" deep, 10" high.

Write for Bulletin 613 . . .
4 pages of bath information.

SINCE 1920

**PRECISION
SCIENTIFIC CO.**



3735 West Cortland St., Chicago 47, Ill.
Local Offices in Chicago • Cleveland • Houston
New York • Philadelphia • San Francisco

Burket (Pennsylvania), and L. Herman (Temple).

After a group luncheon, with an address by vice president I. S. Ravdin (University of Pennsylvania), opportunity was provided for individual conferences with college admission officials and for visits to local professional schools.

Harold J. Noyes, dean of the University of Oregon Dental School, was elected to succeed Joseph L. T. Appleton as vice president and chairman of Section Nd (for 1961). Albert A. Dahlberg (Zoller Memorial Dental Clinic and department of anthropology, University of Chicago) was elected committeeman-at-large, to succeed Joseph C. Muhler, who has completed his 4-year term of office.

The secretary took official notice of the great loss the organization had sustained in the untimely death of two very distinguished members—Balint Orban and Joseph P. Weinmann, both of the School of Dentistry, University of Illinois, and both active researchers in the area covered by the symposium on keratinization.

REIDAR F. SOGNAES, *Secretary*

Pharmacy (Section Np)

Section Np held eight sessions from 27 through 30 December. A total of 43 contributed papers on various studies was reported, and one symposium was held jointly with the Committee on Cosmetics of the American Medical Association. Over 450 persons registered as having attended one or more of the section meetings.

The AAAS Council, the governing body of the Association, elected Joseph A. Oddis (American Society of Hospital Pharmacists) a vice president of the Association and elected Lee H. MacDonald (Upjohn) to serve on the committee-at-large of the section for a 4-year term. Oddis will serve as chairman of the section for the coming year and will preside at the Denver meeting in December 1961. John E. Christian (Purdue) continues to serve as secretary of the section.

Of major interest to the group in attendance was a stimulating vice-presidential address entitled "Dedication to Pharmacy," presented by Joseph V. Swintosky. A symposium entitled "The Scientist's Contribution to the Safe Use of Cosmetics" also attracted considerable interest, not only on the part of the pharmaceutical scientists in



**NEW! SAFE!
CONVENIENT!**

dri-Na

'Baker Analyzed' REAGENT

dri-Na is J. T. Baker's sodium-lead alloy containing 10% sodium. **dri-Na** is the modern way to use sodium in safe, convenient form for

DRYING SOLVENTS and SYNTHESIS OF ORGANIC LEAD COMPOUNDS

SAFE—eliminates hazard. **dri-Na** saves time and effort because it is available for immediate use. You can use it right from the bottle. You avoid the tedious use of a die, often employed with metallic sodium in drying solvents.

Tests show that **dri-Na** reduces water content of solvents satisfactorily without affecting purity. It is safe to use. There is no hazard in disposing of residues: they can be placed directly in water. **dri-Na** is available in 1- and 5-lb. bottles from all J. T. Baker distributors.

Write for a Product Data Sheet giving specifications, typical drying performance, and other helpful information.



**J. T. Baker
Chemical Co.**
Phillipsburg, New Jersey

attendance but also on that of many individuals from other scientific disciplines and of cosmetic scientists located in the New York area. Over 300 persons attended each of the two sessions.

In addition, the hospital pharmacy group had a most informative and well-attended full-day session of discussions and contributed papers on the scientific aspects of hospital pharmacy, under the guidance of George F. Archambault and Joseph A. Oddis. The following groups were represented: the American Society of Hospital Pharmacists, the American Pharmaceutical Association, the New York State Council of Hospital Pharmacists, the American Hospital Association, and the American Association of Colleges of Pharmacy. Luncheon, entertainment, and dinner were sponsored by E. R. Squibb and Sons, Wyeth Laboratories, and McKesson and Robbins, respectively.

John Autian (College of Pharmacy, University of Texas) opened the first session for contributed papers which consisted of presentation of the results of original scientific investigations. Norman J. Doorenbos and his co-workers at the University of Maryland presented a series of six papers describing work recently completed on the synthesis of aza steroids. C. E. Breckinridge (Oak Ridge National Laboratory) and J. E. Christian (Purdue) discussed a new method for isotope dilution analysis of chlorotetracycline. The polarographic properties of some pyridine derivatives were explained by Nicholas G. Lordi (Rutgers).

The effects of corticosteroids and tranquilizers on experimental amebiasis was discussed by James Ingalls (Long Island University). Lee H. MacDonald (Upjohn) described comparative testing of preservative systems. Other papers presented before the first session were "Comparative pharmacology of diphenylmethane derivatives," "Modification of the action of chloral hydrate in mice by the prior administration of nicotinamide," "Facilitation of metrazol-induced seizures by iproniazid," "Structural consideration of steroid borates," "The effect of ultrasound on the production of microcrystalline progesterone," and "Evaluative procedures for film-forming materials used in pharmaceutical applications." These papers were presented by Arlan G. Roberts (J. B. Roerig and Company), Robert G. Brown (University of Texas), Albert M. Ellman (Rutgers), George M. Sieger (Led-

AINSWORTH

Premium Quality at Competitive Price

RIGHT-A-WEIGH

One-Pan Analytical Balance

**FAST
ACCURATE
EASY TO USE**

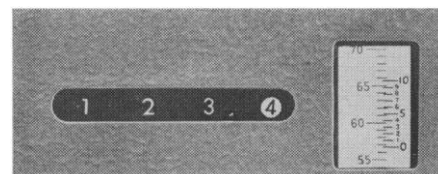


CONTROLS

All controls on front of case, clearly designated. Independent pan brake stabilizes the pan before beam is released. Simple mechanical zero adjustment, large range, no distortion. Easy-working doors with comfortable finger-grips.

READOUT

Eye-level, in-line, unobstructed readout. Wide-spaced lines on projected scale. Projection scale in recessed shadow box. Light filter in optical path cuts out glare.



FAST...weighing procedure is simply to load pan, dial weights, read results.

ACCURATE...substitution weighing eliminates arm-length errors, gives constant sensitivity and accurate values.

EASY TO USE...anyone can weigh quickly and accurately with the Right-A-Weigh...frees skilled people for other work.

Capacity: 200 g. Sensitivity: 1/10 mg. Readability: 1/20 division on projected scale using vernier. Reproducibility: ± 0.03 mg.

Special Models: SCX, explosion proof; SCD, diamond balance calibrated in carats; SC 300, 300 gr. cap.



Symbol of Quality and Progress Since 1880.

WRITE FOR BULLETIN 659.

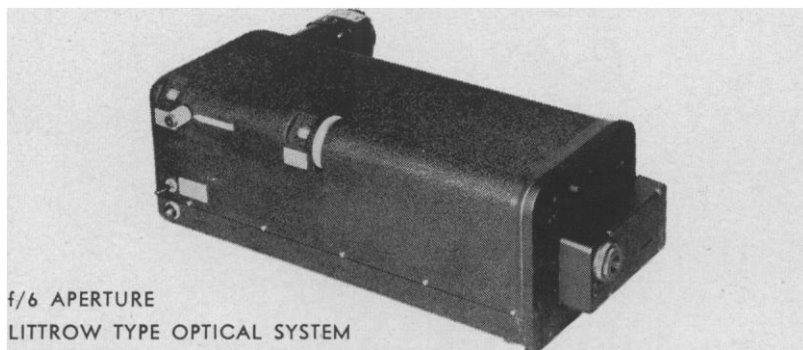
MADE IN U.S.A.

WM. AINSWORTH & SONS, INC.
2151 LAWRENCE ST. • TELEPHONE ALpine 5-1723 • DENVER 5, COLORADO

Introducing the . . .

RUDOLPH MONOCHROMATOR

MODEL 655 FOR THE VISIBLE AND ULTRAVIOLET SPECTRUM



f/6 APERTURE

LITTROW TYPE OPTICAL SYSTEM

DIRECT READING IN MILLIMICRONS

200 TO 700 MILLIMICRONS WAVELENGTH RANGE

ENTRANCE AND EXIT SLITS ADJUSTABLE IN UNISON

OPTICS OF UV GRADE FUSED SILICA

MOTOR DRIVEN WAVELENGTH MOVEMENT PLUS A FINE ADJUSTMENT FOR INDIVIDUAL SETTINGS.

FOR FURTHER DETAILS, PLEASE WRITE TO O. C. RUDOLPH & SONS, INC.
P. O. BOX 446, CALDWELL, NEW JERSEY, U. S. A.

LOW BUDGET...

GOW-MAC RESISTANCE FILAMENTS

...FOR FAST DELIVERY

METAL	FORM	Nominal Resistance COLD	OHMIC	Current in Air at Room Temp. (Milliamps D.C.)
TUNGSTEN, BARE WIRE	HELIX	20	30	150
TUNGSTEN, GOLD PLATED	HELIX	18	27	150
TUNGSTEN, TEFLON CLAD For Chlorine and Fluorine Bearing Samples	HELIX	23	34	180
KOVAR (ALLOY OF NICKEL, COBALT, IRON)	STRAIGHT	5	8	200

NOTES:

(1) 12" Leads are .030 Kovar wire, silver soldered and insulated with fiber glass sleeve.

(2) Teflon clad tungsten helix is coated to a maximum of .005 inch. Melting point of coating is approximate 250°C (482°F).

For use with corrosive gases or where vibration or shock are present.

Response time is increased because of greater filament mass; signal strength is diminished except where current (filament temperature) can be increased.

ALSO AVAILABLE:

- Thermal Conductivity Cells for Gas Analysis
- Micro-Cell for use with 1/8" Packed Columns, VPC
- Gas Blenders for Automatic Mixing of Gases
- Temperature Regulated Cells
- Gas Density Detectors for VPC
- Portable and Panel Instruments

VISIT BOOTH 406—PITTSBURGH CONFERENCE ON ANALYTICAL CHEMISTRY AND APPLIED SPECTROSCOPY, FEB. 27 TO MARCH 3.

GOW-MAC INSTRUMENT COMPANY

100 KINGS ROAD, MADISON, N. J., U. S. A. • Telephone: FRontier 7-3450

GAS ANALYSIS BY THERMAL CONDUCTIVITY SINCE 1935

erle), Donald M. Skauen (University of Connecticut), and Joseph L. Kanig (Columbia), respectively.

Lee H. MacDonald opened the second session of contributed papers and presided over the meeting. The papers presented were as follows: "A discussion of the electro-magnetic wave theory," "A comparison of operating characteristics of a liquid and plastic scintillator," "Sterilization of regenerated collagen with beta-propiolactone," "Re-evaluation of certain atomic refractions," "Growth of medicinal plants in culture," "Description of a volatile oil obtained from a plant indigenous to Louisiana," "A continuous practical method for production granulation," "Binding of cations and anions by a nonionic surface active agent," "A technique for studying thermally induced phase transitions," and "The synthesis of 2-methyl-2-phenyl-3-(dialkylaminoalkyl) benzothiazolines and 2,2 - dimethyl - 3 - (dialkylaminoalkyl) benzothiazolines as potential tranquilizers." These papers were presented by Harry Lobel (Nebraska Iowa Electrical Council), George Foster (Purdue), Edwin L. Ball (Lederle), P. J. Jannke (University of Connecticut), A. E. Demaggio (Rutgers), John T. Goorley (Northeast Louisiana State College), E. T. Martin (Merck, Sharp, and Dohme), P. P. De Luca (Temple), D. R. Reese (Smith, Kline, and French), and C. S. Davis (Purdue), respectively.

This was one of the most successful meetings Section Np has held and was exceedingly well attended.

JOHN E. CHRISTIAN, *Secretary*

Safe Use of Cosmetics

The symposium, "The Scientist's Contribution to the Safe Use of Cosmetics," cosponsored by the Committee on Cosmetics of the American Medical Association and Section Np (Pharmacy) of the AAAS, met for two sessions on 29 December. Nine papers were presented, indicating ways in which the research biologist, the dermatologist, and the cosmetic chemist could work together to formulate safer cosmetics and outlining the responsibilities of manufacturers and the government with respect to the marketing of cosmetic products.

In presenting the research biologist's view, William Montagna (Brown) discussed some problems of biological research related to the development and use of cosmetics, with particular refer-

a **WINNING TEAM...**
for the
Life Scientist

LABORATORY STIMULATOR



**MODEL
104-A**

A precision instrument designed and built for versatility.

- Direct reading & resettable to 0.1%
- Stimulus duration 10 microseconds to 1 second
- Single, pairs or trains of stimuli
- Repetition rate 1/10 cycle to 10,000 cycles per second
- Output 250 volts at 25 watts
- Delay 100 microseconds to 10 seconds

THESE TWO PIECES OF EQUIPMENT WERE
MADE FOR EACH OTHER. THIS TEAM,
WORKING IN UNISON, WILL
HELP RESOLVE YOUR
MOST DIFFICULT
PROBLEM

The
251-A is
the perfect companion
piece for the 104-A

**DIRECT COUPLED
WIDE BAND
AMPLIFIER**



MODEL 251-A

A unique amplifier designed specifically for work in biology, neurology, pharmacology and related areas of biophysical research.

- Direct coupled throughout or selectable time constants
- In phase signal rejection 50,000:1
- Variable bandwidth
- Input impedance 100 megohms
- Low drift
- Gain 100,000; 100 microvolt input for 10 volt output

More data on request

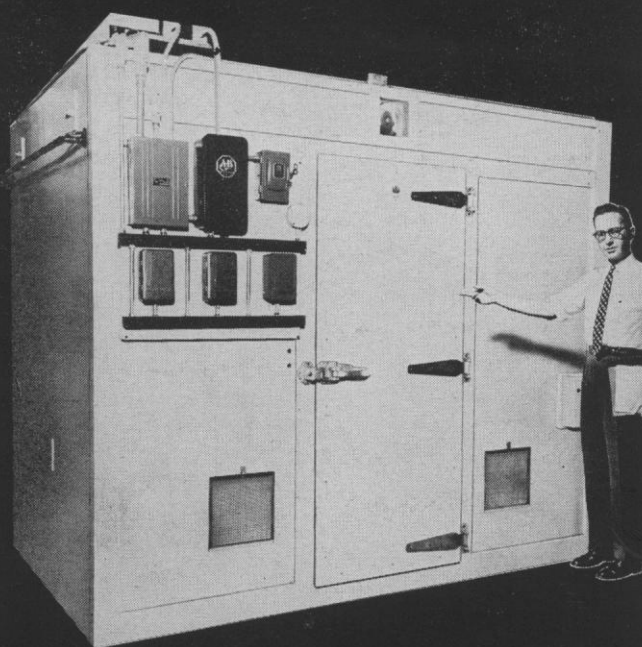
Investigate the opportunities at AEL for creative engineers

AEL

**AMERICAN ELECTRONIC
LABORATORIES, INCORPORATED**

121 N. 7th St.
Phila. 6, Penna.

PERCIVAL PLANT GROWTH LAB



meets the exacting climatic needs for botanical research

- **HIGH LIGHT INTENSITY:** 3,000 foot candles at 36 inches guaranteed. May be varied downward to 700 foot candles.
- **FLEXIBILITY:** Reproduces climatic requirements from 45° F to 95° F, and any photo period desired.
- **PRACTICAL SIZE:** Convenient walk-in unit. Inside dimensions: 98¾" long, 62¾" wide, 85⅝" high.
- **ECONOMY:** Low initial cost. Low operating cost.

for further information
MAIL COUPON TODAY



PERCIVAL REFRIGERATION & MFG. CO.
Box 589-S • Boone, Iowa

Please send bulletin on Percival Plant Growth Lab.

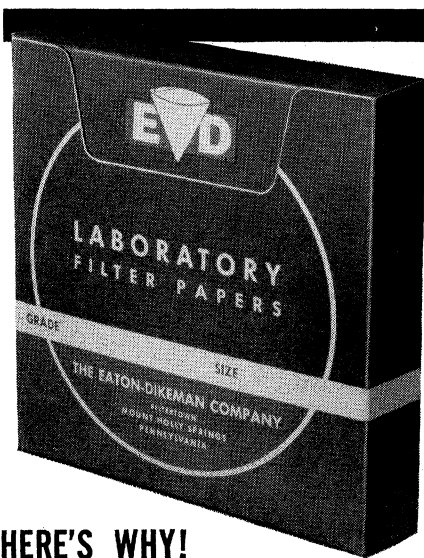
Name _____

Address _____

City _____ Zone _____ State _____

EATON - DIKEMAN FILTER PAPER

Used in 7 out of 10 laboratories



HERE'S WHY!

- **Complete range** — whatever rapidity, and retention characteristics you desire, chances are there's a standard E-D paper available. Made with smooth or creped surfaces, in plain or fluted circles, in strips, or rolls, or cut to your individual requirements.
- **Highest purity** — only the purest pulp available is used.
- **Uniform quality** — every step of the manufacturing process is carefully controlled and checked.
- **Excellent wet strength** — special resins incorporated.
- **Complete technical service** — whatever your filtering problem may be, Eaton-Dikeman with its broad background of more than seventy years of manufacturing filter papers exclusively, can probably solve it.

Also available—papers for chromatography and electrophoresis, as well as bibulous and lens papers. Write for free samples.



EATON-DIKEMAN CO.
Mount Holly Springs, Pennsylvania

ence to the degree to which the ingredients of various cosmetics penetrate human skin. Kenneth Wilson (U.S. Army Chemical Research and Development Laboratories) discussed new methods for the study of percutaneous absorption. He presented slides and a film illustrating the methods that he uses to study skin penetration, including radioisotope tracer methods and an improved technique of preparing a perfused skin flap. William Bousquet (Purdue) discussed the general properties of radioactive isotopes as well as ways in which tracer techniques should prove valuable to the cosmetic scientist and manufacturer. Glen Sperandio (Purdue) discussed the qualifications of a cosmetic chemist, standards for a "safe" cosmetic, and a formulation technique that can be used to achieve such standards.

Allan Lorincz (University of Chicago), speaking from the standpoint of the dermatologist, stated that dermatologic research should play a fundamental guiding role in the formulation of cosmetics. Types of reactions which the dermatologist encounters in his practice were discussed by Howard T. Behrman (New York) along with causal mechanisms, clinical features, diagnosis, and therapy. Adolph Rostenberg (University of Illinois) gave an evaluation of currently used methods of appraisal for potential hazard, indicating their limitations and the need for better screening techniques.

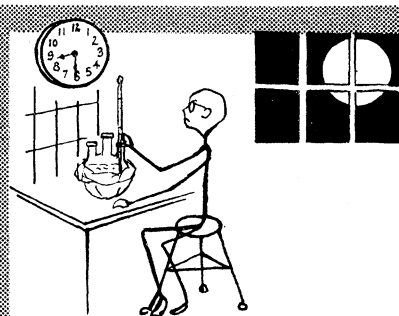
Willard Bright (Lever Brothers) indicated that the industry wants to market only safe cosmetic products and, to this end, is sponsoring ever-expanding company research programs and co-operating more and more extensively with both scientific investigators and U.S. Food and Drug Administration representatives. Irvin Kerlan (U.S. Food and Drug Administration) outlined the government's role in the control of cosmetics.

Extensive and lively discussion periods followed the afternoon and evening programs.

JOSEPH B. JEROME,
Symposium Secretary

Agriculture (Section O)

Section O followed the precedent of recent years in designing a symposium program to illuminate a major national problem of great concern to everyone, but one in which leadership may well rest with the agricultural segment of



Scientist Sam
at the bench
Working hard,
working late
Fluctuating temperatures
Upset his reaction
rate

*Avoid this
situation
yourself
by
ordering*

THERM-O-WATCH

- ★ **VERSATILE**
Use on Manometers, too!
- ★ **SENSITIVE**
to a fraction °C
- ★ **ECONOMICAL**
Saves time, Saves money

WITH THERM-O-WATCH—
your thermometer becomes a
TEMPERATURE CONTROLLER

write for Bulletin S-1

I²R INSTRUMENTS for RESEARCH and INDUSTRY, CHELTENHAM, PA.

WITH THERM-O-WATCH—
your thermometer becomes a
DISTILLATION CONTROLLER

write for Bulletin S-3

I²R INSTRUMENTS for RESEARCH and INDUSTRY, CHELTENHAM, PA.

WITH THERM-O-WATCH—
your MANOMETER can sound
a PRESSURE WARNING! BEEP!

write for Bulletin S-5

I²R INSTRUMENTS for RESEARCH and INDUSTRY, CHELTENHAM, PA.

the economy of the United States. This year's symposium, "Land Zoning in Relation to Agricultural, Suburban, Industrial, Forest, and Recreational Needs of the Future," was divided into five sessions of a half-day each, synchronized with an additional AAAS-sponsored half-day session on urban redevelopment (the complementary phase of land planning and use).

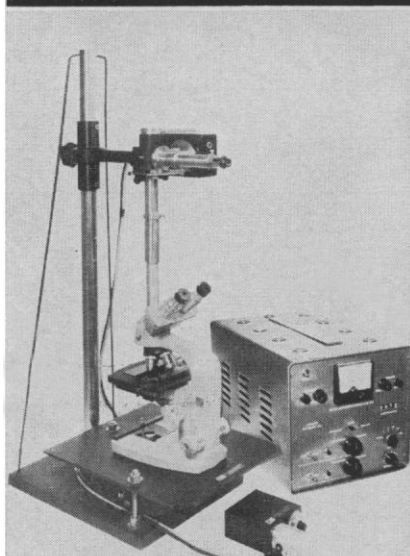
The entire symposium involved a wide range of disciplines; thus AAAS members affiliated with Section O were given an opportunity to review broad subject-matter areas in a way not generally provided by any individual scientific society in its own programs. The attendance at the various sessions totaled about 625. These audiences were composed of responsible professional, scientific, and civic leaders from many states, who are deeply concerned with land planning, land zoning, and land use to meet the needs of the whole population in the near future and the decades beyond.

The entire program was developed and directed by vice president Firman E. Bear, 1960 section chairman. The excellence of the program was insured by the participation of speakers of outstanding ability who have made notable contributions in this field. Part 1 dealt with rural land zoning, with Wallace D. Bowman of the Conservation Foundation serving as chairman. Speakers at this session were D. A. Williams (Soil Conservation Services), E. D. Solberg (Agricultural Research Service, U.S. Department of Agriculture), Karl J. Belser (Santa Clara County, California, Planning Department), and T. W. Schulenberg (Department of Commerce and Public Relations, Indiana).

Part 2 dealt with suburban planning, under the chairmanship of Louis Wolfanger (Michigan State University). Four phases of this subject were developed by H. R. Pomeroy (West Chester, N.Y., County Planning Department), L. J. Bartelli (U.S. Soil Conservation Service), Marion Clawson (Resources for the Future, Inc.), and G. F. Whitehead and Robert Kates (University of Chicago).

Part 3, which followed the AAAS program on urban renewal, concentrated on community planning, under chairman Byron E. Munson (Ohio State University). Rural, county and regional, and small city communities were included. The speakers were H. H. Smith (Community Planning Associates), G. H. Deming ([New York]

CANALCO ANALYZERS TAKE THE LABOR OUT OF LABORATORY



IN MICRO-CHEMISTRY

the new

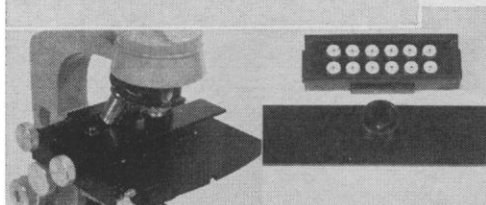
Ultra-Microspectrophotometer

Ultra-Microspectrophotometer gives fully automated quantitation, in both the visible and the U.V. for

- cell components
- tissue extracts
- fluorescence
- micro-liquids (10-50 ul)
- interference microscopy
- autoradiographs
- micro-chromatography (10 ul flow cuvettes)

Two Models

1. Digital Ratio Reporter, for one and two wavelength analysis
2. Absorption Curve Computer, for spectral curve recording



Micro-chemical Cuvettes

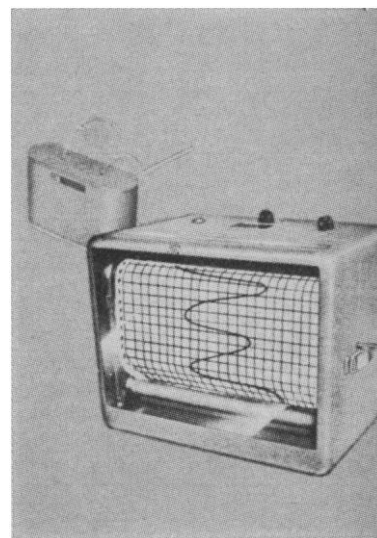
... IN FRACTION ANALYZING

Base Compensating U.V. Flow Analyzer

For automatic location and measurement of ultraviolet-absorbing materials in flow, with flat base line and full sensitivity maintained in the presence of U.V.-absorbing solvents. For use in column chromatography and other flow systems.

FIVE MODELS for . . .

- broadly absorbing materials
- specific wavelengths
- monochromatic density studies
- 260/280 ratios
- simultaneous monitoring of one to eight columns at one or more wavelengths.



**CANAL
INDUSTRIAL
CORPORATION**

Dept. SF/4940 St. Elmo Avenue, Bethesda 14, Maryland

Freeing the Scientist for Science

Conference on Metropolitan Area Problems), S. S. Farness (Tri-County Regional Planning Commission, Lansing, Michigan), and W. J. Wayne (Indiana Geologic Survey).

Part 4 on forest and recreational planning, was presided over by Edward Higbee (University of Delaware). Four phases of this subject were discussed, by Paul B. Sears (chairman, conservation program, Yale), Charles W. Eliot (planning consultant, Cambridge, Massachusetts), Edward C. Crafts (U.S. Forest Service), and Ra-

leigh Barlowe (Michigan State University).

Part 5 concluded the symposium with a program on "Government as Land Owner and Redistributor"; William Miller (New York University) was chairman of the session. The following four speakers developed this subject: Max S. Wehrly (Urban Land Institute), Shirley A. Siegel (Assistant Attorney General for New York State), Charles Abrams (planning consultant, New York City), and Robert E. Lowry (Tennessee Valley Authority).

The symposium was most successful in bringing the problem of land planning and land use for the public welfare into sharp focus. The many aspects of the subject were clearly presented; the amount of information and experience already available from regional and national leaders and specialists is substantial and all that is now needed is the dissemination of this information to communities and regions that will carry the responsibility for action.

The election of Wynne Thorne as a vice president of the AAAS and 1961 chairman of Section O was confirmed by the Council. Thorne succeeds Firman E. Bear, who was elected to a 4-year term as a committeeman-at-large. Thorne, director of the Utah Agricultural Experiment Station, has accepted the responsibility for developing a symposium program for the 1961 Denver meeting on the agricultural potential and development of the Great Plains and the Intermountain Regions.

HOWARD B. SPRAGUE, *Secretary*



A \$50,000 POLICY FOR \$106.50?

This professor was delighted!

He found TIAA's new low-cost Home Protection Plan the perfect answer to his need for a great deal of insurance now but less as the years go by—as his children grow up, savings and investments increase, the mortgage is paid off.

At his age of 30, a 20-year Home Protection policy providing a \$50,000 initial amount of insurance calls for a level annual premium of \$193. The cash dividend of \$86.50 at the end of the first policy year reduces his first year net cost to \$106.50, according to the current dividend scale. Dividends are declared once each year and thus cannot be guaranteed for the future.

This level premium Term plan provides its largest amount of protection initially and reduces by schedule each year to recognize decreasing insurance needs. Insurance periods of 15, 20, 25 or 30 years are available.

Teachers Insurance and Annuity Association (TIAA) is a unique, nonprofit life insurance company established by Carnegie organizations in 1918 to serve the field of higher education.

Any full- or part-time employee of a college, university, nonprofit private school or nonprofit educational or research organization is eligible to apply for TIAA individual life insurance—regardless of whether the institution has a TIAA retirement plan. Do you qualify? If so, send for your personal illustration of the new Home Protection Plan (issued at age 55 or younger)—or use the coupon to ask for details on TIAA's many other low-cost plans.

We employ no agents—no one will call on you.

TIAA 730 Third Avenue New York 17, N.Y.	Please send information on:	
	<input type="checkbox"/>	a _____ year policy of \$ _____ initial amount.
	<input type="checkbox"/>	other plans available.
	Name _____ Date of Birth _____	
	Address _____	
Employing Institution _____		



Education (Section Q)

The New York meeting was the most successful meeting for Section Q in many years. The programs attracted a large attendance. At meeting after meeting there was standing room only, and in some instances substantial numbers had to be turned away, though one program—an evening program on 30 December—was poorly attended.

The quality of the programs seemed better than in former years. It was gratifying to note the attendance and the vigorous and constructive contributions of colleagues from the academic disciplines in many of the Section Q programs.

Section Q cosponsored two sessions with the Council for Exceptional Children and two sessions with the American Educational Research Association. The teaching societies sponsored their usual extensive and diversified programs. Section Q sponsored four sessions of contributed papers and the vice-presidential address. One session of contributed papers was concerned with problems associated with education of the gifted student. Another focused on the instructional problems associated with the use of educational television. The other two sessions were more varied but reflected interest in the cultural and social factors associated with discipline and vandalism, at-

Narrow Band Interference Filters

MADE BY

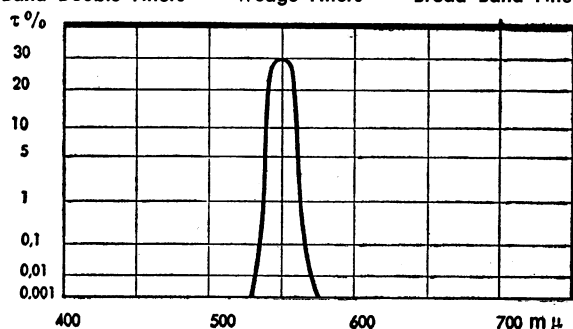
JENAer Glaswerk Schott & Gen.

WEST GERMANY

For the spectral region from 300 to 2,000 m μ .
Transmission up to 60%. Half-value width down to 5 m μ .
Tolerance at peak wave length:
 $\pm 1\%$ for regular quality . . . $\pm 0.5\%$ for precision quality.
—0

AVAILABLE AS

Line Filters • Line Double Filters • Band Filters
Band Double Filters • Wedge Filters • Broad Band Filters



BAND DOUBLE FILTER

Tmax abt. 30%. Half width abt. 16 m μ .
Ratios: Tenth width to half width 1.5, Hundreth width to half width 2, Thousandth width to half width 3.5.

Write for further information

Fish-Schurman Corp., 74 Portman Road, New Rochelle, N.Y.

Fish-Schurman

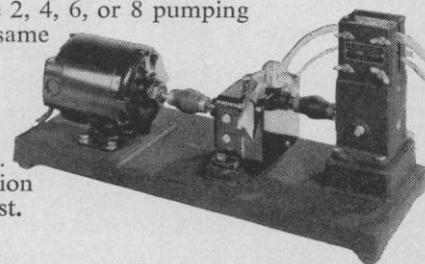
AUTOMATION IN COLUMN CHROMATOGRAPHY

with the SIGMAMOTOR PUMP

Vernier Adjustment Insures Accuracy at Low Flows

Various column chromatography metering operations are simplified by the use of a peristaltic type constant volume pump, such as the Sigmamotor Model T-8. A typical installation combines the Sigmamotor pump with solenoid actuated valves and timing equipment to deliver elutant buffers into ion exchange columns on a reproducible schedule. The T-8 pump is equipped with vernier for accurate flow adjustment.

Single Sigmamotor units can be provided to handle 1, 2, 3, or 4 simultaneous pumping operations. Double units are available to handle 2, 4, 6, or 8 pumping operations at the same time. Capacities from 1 cc to 250 cc/minute are obtained by the vernier adjustment. Complete information available on request.



SIGMAMOTOR Inc.

68 NORTH MAIN STREET

MIDDLEPORT, NEW YORK

For more information, turn to Data Service card, circle No. 108

BACTRONIC COLONY COUNTER

All-Transistor Electronic Colony Counter
Marks as it Counts Automatically
In Open and Closed Petri Dishes

Four precision counting devices make this instrument indispensable for routine colony counting and in phage and bacterial genetics: an Electronic Marking Probe; A Plug-in Marking Grease Pencil or Plug-in Marking Pen; and a Pushbutton Counter.

Colonies are accurately recorded in a *single* probing action that leaves an identifying puncture in the agar. The Electronic Probe picks up radio impulses on contact with *any* agar medium and actuates the counting mechanism. Electrical splat-tering is completely eliminated by the low voltage input. Where puncturing is undesirable, the Plug-in Grease Pencil or Marking Pen is used to mark the back of the plate as it counts.

Plates are flooded with brilliant white light that is cool, soft and easy on the eyes. Specimens are illuminated in bold relief against a contrasting agar background, revealing colony morphology. Even pinpoint colonies are easily discerned.

The instrument has an automatic numerical reset to zero, a sterilizing Probe Well and a magnifying lens.



UNCONDITIONAL
1 YEAR WARRANTY

WRITE FOR
CATALOG
C1105-2171



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



SCIENTISTS

for basic research
in plasmas, liquids, solids
and gases

If you are interested in basic investigations into the fundamental nature of matter we invite an early contact. We can offer immediate staff appointments to at least 10 Ph.D's with appropriate backgrounds.

These positions have resulted from a number of significant scientific accomplishments made in our laboratories in the last year. Thus, we need additional top scientists not only to work on major expansions in present investigations, but also to initiate programs in the many promising side avenues uncovered by each forward step.

These current advances have

resulted, we believe, from an environment tailored to the scientist. Independence of scientific action and thought is encouraged as are investigations into promising side areas. Complementary services are available in depth and variety.

Most of our research studies are corporate-sponsored and projected over long periods. Thus, they offer a personal stability not always associated with research in industry.

It is possible that the combination of our environment and the opportunity to work on these projects may help you add additional stature to your reputation.

*Why not write today to Mr. W. P. Walsh or call
Hartford, Conn., Jackson 8-4811, Ext. 7145.*

RESEARCH LABORATORIES
UNITED AIRCRAFT CORPORATION
400 Main Street, East Hartford 8, Conn.



titudes, vocational choices, and other problems.

A symposium on data-processing machines and educational research was provocative and stimulating. John C. Flanagan's vice-presidential address was devoted to a discussion of the educational implications of the research investigation "Project Talent," which he directs.

The section committee met formally on the day prior to the annual business meeting and met again, informally, after the business meeting. Problems of communication, future programs, and other matters were discussed.

The business meeting was probably the best attended in the history of the section. Participation was excellent, and great interest in section affairs was evinced. A number of helpful suggestions were made, which will guide the Section officers in meeting their responsibilities.

HERBERT A. SMITH, *Secretary*

The Retarded Child

The joint session of Section Q and the Council for Exceptional Children, on 26 December, was very successful. There were about 175 persons in the audience. Margaret Giannini, talked on the etiological and diagnostic aspects of the retarded child. She made it very clear that mental retardation is not an illness in itself, and that we must know about the pathological causes of retardation in order to truly understand and plan a program for mentally retarded children.

Lawrence Taft discussed "pseudore-tardation." He stressed the importance of team work in diagnosis and in clinical therapy. Elsa Haussermann made a plea for a thorough evaluation and a team of professional persons to work with retarded children, especially with children who have serious multiple handicaps—children that she called "special specials." William C. Barger stressed the importance of team work, then narrowed his discussion to aphasiac children and told of success in using the mirror board with these children. The audience asked many questions, and nearly half of them remained to see special slides of work with aphasiac children.

The audience of the morning session on 27 December was smaller but gave close attention to the speakers. Emphasis at this session was on the education of handicapped children, although two of the speakers discussed problems

with gifted children. Raphael F. Simches listed trends in the education of special children and then discussed briefly some of the problems that are arising because of these trends and described expansion of work with the special children.

Romaine P. Mackie discussed research that is needed in working with all types of special children. She said that a terminology is very important, in order that mechanical cards can be used in research. She said that research is needed for the child, for parents and their needs, and for the teachers. She urged that research be reported in such a way that it can be understood.

I. I. Goldberg gave a description of a research project with preschool, mentally retarded children. The study will compare children in regular classes who have had this preschool training with others who have not had the training.

The audience asked many questions of all three speakers, and time was called before all of the questions could be heard. This seems to be one proof of an excellent meeting.

KATHERINE D. LYNCH,
Program Chairman

Research Symposium (Q4)

"Research and implications in teaching science," in the elementary school, in the secondary school, and at the college level, was the subject of the Research Symposium of the National Association for Research in College Teaching. The speakers were Cyrus W. Barnes (New York University), Hubert M. Evans (Teachers College, Columbia University), and Nathan S. Washton (Queens College).

NATHAN S. WASHTON, *Program Arranger*

National Science Teachers Association (Q5)

The theme of the sessions of the National Science Teachers Association meeting with the AAAS was "The New Science—A Teaching Challenge." The papers, each by a distinguished scientist, presented recent developments in five different areas of science. Each paper was followed by a discussion, by educational specialists, of the significance of the information presented by the speakers for elementary and secondary classrooms.

Alfred B. Garrett (Ohio State University) spoke on "The new chemistry." Wasley S. Krogdahl (University of Kentucky) dealt with "The new astronomy." Hugh Odishaw (U.S. Na-

...third of a series.

MEETING THE CHALLENGE OF ENVIRONMENT—

OCEANOGRAPHIC AND NUCLEAR
SUBMARINE APPLICATIONS.

Anton nuclear detectors go down to the sea encapsulated in probes for deep-sea radiological research. They cruise the ocean depths as part of the reactor instrumentation of our advanced nuclear submarine fleet.

Anton gamma detectors like the Type 314, 315 and neutron detectors and chambers like 805/6307, 807/6377, 812/6376, and 813/6937 are specified because of their ruggedness and reliability.

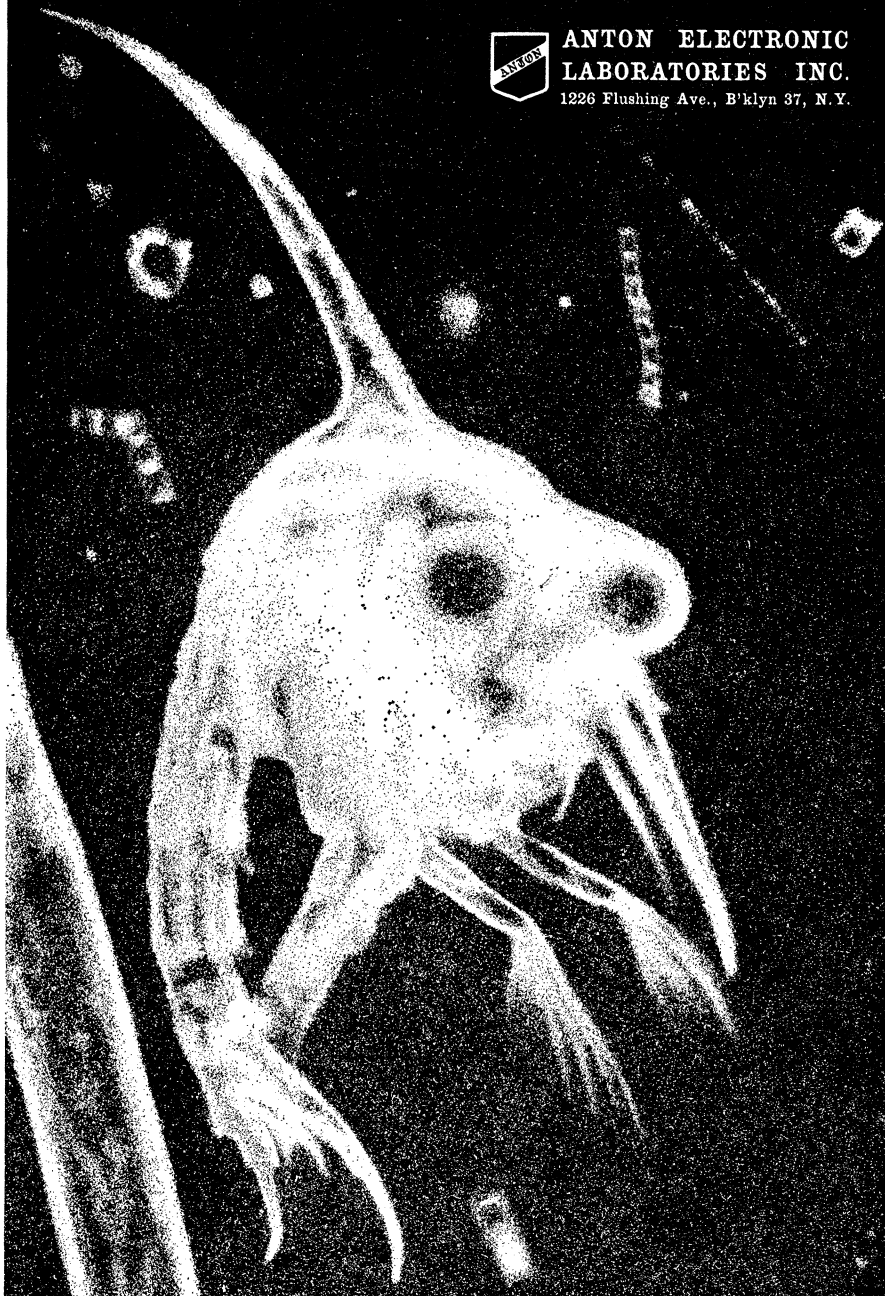
For more than 12 years Anton detectors have been developed, produced and "quality controlled" to deserve the confidence that makes them "first" for remote applications of military users as well as noted oceanographic research institutes.

Chances are—one of the 300 some odd α , β , γ and neutron detectors available from stock (or 4 to 6 week delivery) may meet your unusual environmental challenge. If not, we can help you—as we have done others—by development of detectors for your specific needs. Anton Detector data belongs in your file—send for Bulletin E3.



ANTON ELECTRONIC
LABORATORIES INC.

1226 Flushing Ave., B'klyn 37, N.Y.



NEWS ABOUT

MICRO SPECTROPHOTOMETRY

Special optics for measurements in the ultra violet are now available. These lenses are corrected for the spectral range 2000-7000 Å and do not require refocusing at different wave lengths. They may be ordered separately or as components for our own spectrophotometric equipment.

For complete information write Brinkmann Instruments, 115 Cutter Mill Road, Great Neck, New York. Six other offices to serve you: Philadelphia, Cleveland, Houston, Miami, Menlo Park, Calif., St. Louis.

ZEISS

BRINKMANN

tional Committee for the International Geophysical Year) spoke on discoveries in earth science resulting from IGY activities. Harry Wexler (U.S. Weather Bureau) discussed recently developed methods in weather forecasting. The fifth paper in the series, by Irvin J. Kopin (National Institute of Mental Health), was "The biology of the mind." Kopin discussed the biochemical bases for human behavior.

In addition, three IGY films were shown and a program on current NSTA activities was presented.

The coffee hour for members of the American Nature Study Society, the National Association of Biology Teachers, the National Association for Research in Science Teaching, and NSTA was a pleasant occasion and was well-attended by members of all four societies.

MARGARET J. MCKIBBEN,
Program Chairman

Academy Conference (X1)

The Academy Conference program opened on 26 December with a session on junior academies, with E. M. Gurr (Central High School, Phoenix, Arizona) presiding. The status of the junior academy movement and problems of organization and operation were discussed by Harry Bennett and Wayne Taylor, respectively. This presentation was followed by a panel discussion on the projected programs of junior academies, with Gerald Acker, Bennett, Elnore Stoldt, Taylor, and Floyd West as participants.

The morning of 27 December was given over to the business meeting and discussion of activities of the academies of science. A considerable part of the discussion centered around the relationship of junior academies to senior academies and the sponsorship of all junior science programs. The consensus was that the senior academies were in the best position to head up the varied programs directed toward the development of future scientists. The meeting was closed with the election of officers. E. Ruffin Jones (University of Florida) and J. Teague Self (University of Oklahoma) were chosen as president-elect and secretary, respectively.

The afternoon session was devoted to a discussion of the utilization of National Science Foundation grants by academies of science. Programs of four states were discussed by James Rutledge (University of Nebraska), John

new **THERMOLYNE**

**micro size
hot plate**

3 9/16" dia.

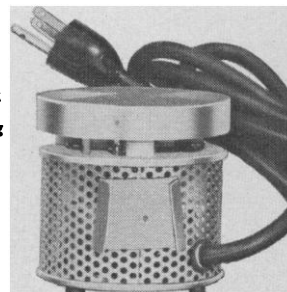


Precise, stepless
thermostatic control,
from 6°C above
ambient to 370°C (700°F)

Type 2300—invaluable for those laboratory situations where a single or multiple heat source is needed, yet space and money are scarce. Ruggedly built to withstand hard, continuous usage. Takes less than nine minutes to reach 370°C top temperature (reserve power at 370°C is 46%). Perforated stainless steel case . . . well ventilated . . . long-life heating element . . . cast aluminum top. Stepless control automatically compensates for fluctuations in line voltage and ambient temperatures. Easily read control dial. 3 9/16" dia top plate . . . 3 3/4" height. 115v a-c. Price complete with 5' cord and 3-prong plug. **\$15.00**

Standard dovetail
socket welded to back
of case. Adapter
included with 6" long
aluminum rod for use
as nonslip handle.

Write for literature
and name of nearest
dealer.



THERMOLYNE CORPORATION

(formerly Thermo Electric Mfg. Co.)

568 Huff St., Dubuque, Iowa

POWER

right on your
work table

MULTIFIX

**multipurpose
apparatus**

The MULTIFIX 1/10 H.P. electric Multi-purpose Motor is the basis of the whole range of laboratory and workshop devices which make up this very versatile equipment. A single control handle, when moved either side of its central position, gives infinitely variable speeds in either direction of 0-2800 rpm. Snap-on attachments are quickly made to perform many duties for both laboratory and workshop.

For full details of this equipment, or the NEW 1961 44-page Bel-Art Catalog showing hundreds of plastic ware items for science and industry, consult your nearest dealer or write to:

BEL-ART PRODUCTS,
PEQUANNOCK, N. J. OXbow 4-0500



Attachments Available:
STIRRERS
MAGNETIC STIRRERS
SUCTION AND COMPRESSED AIR PUMPS
LIQUID PUMPS
BUNG AND CORK BORERS
GRINDERS • JIG SAWS
CIRCULAR SAWS
POLISHING MOP ARBORS
SMALL HAND TOOLS

IF IT HAS AN END-POINT . . .

the **CHLORIDOMETER®**

Will Find It Quickly, Accurate and Automatically!

**IN 6 STEPS
AND IN LESS
THAN 60
SECONDS**

The CHLORIDOMETER uses an amperometric end-point to obtain an automatic shut-off at a pre-set increment of indicator current.

The only automatic chloride titrator with these features:

- Electrodes interchangeable in easily removed assembly.
- Instrument used in comfortable sitting position.
- Nomograph gives chloride concentration without calculating.
- Immediate delivery from stock.
- ACCURACY: $\pm .5\%$, better than $\pm .1\%$ under optimal conditions.
- SENSITIVITY: 0.25 microequivalent.
- SAMPLE SIZE: 0.01 ml or more of serum with $\pm .5\%$ accuracy, smaller amount with diminishing accuracy.

For Specifications and Details, Request Bulletin S4-2000

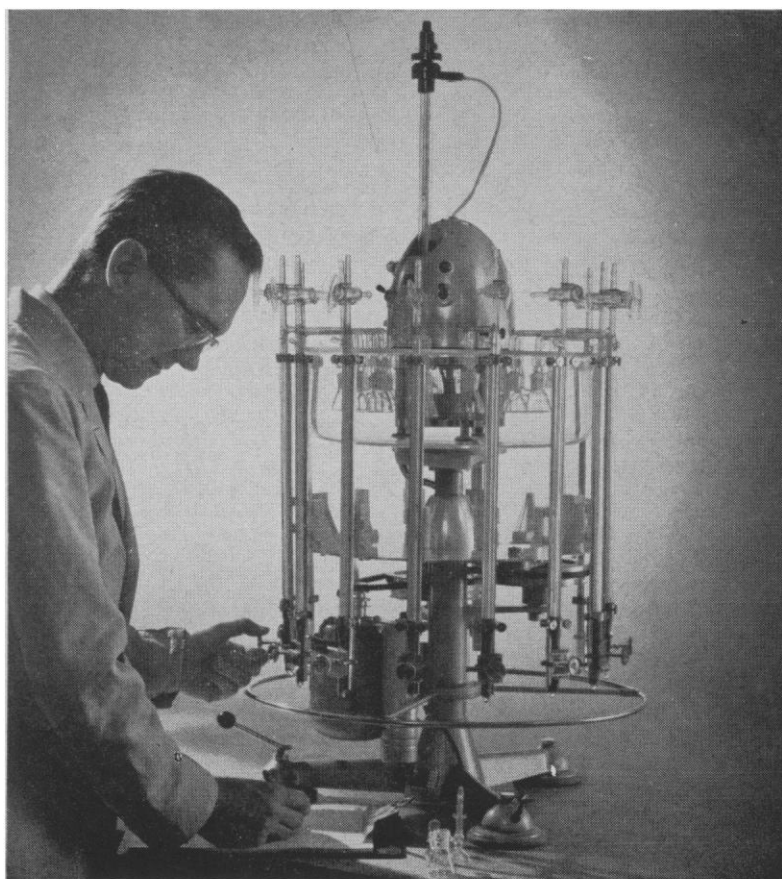
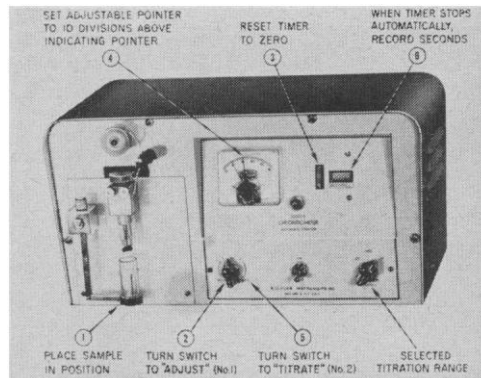
LABORATORY APPARATUS



PRECISION INSTRUMENTS

BUCHLER INSTRUMENTS, INC.

514 West 147th Street
New York 31, N. Y.
ADirondack 4-2626



trim
for today's
compact lab...

**New Bronwill
WARBURG
APPARATUS**

Every design feature is for space economy and efficient, time-saving use. 320° rotation brings any of 14 double capillary manometers out front for quick reading. Also—new lagless electrode heating. Special UVL model for photosynthesis.

WRITE FOR ILLUSTRATED LITERATURE

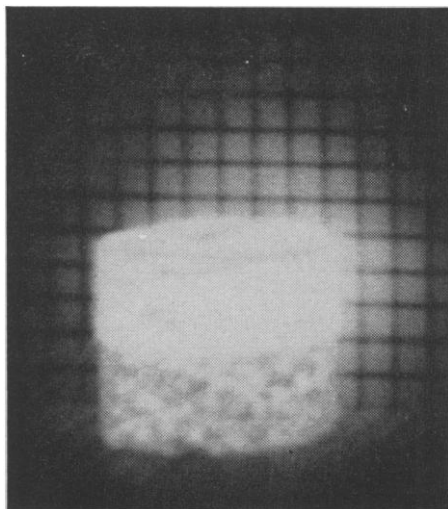


BRONWILL SCIENTIFIC
A DIVISION OF WILL CORPORATION

275 N. GOODMAN ST. • ROCHESTER, N. Y.

ISOTOPES

for Your Development Work



Oak Ridge National Laboratory 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—Iridium-192 gamma sources with specific activity up to 100 curies per gram, and cobalt-60 radiography sources 1/8 and 1/16-inch in diameter with specific activity greater than 100 curies per gram. At a reduced price, carbon-14 barium carbonate is available at \$9.50 per millicurie.

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 information or literature, 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



Yarbrough (Meredith), and Arlo Smith (Southwestern University of Memphis). Charles La Motte (Texas A. and M.), who was to have been the fourth participant, was unable to be present but provided copies of his talk.

The traditional banquet featured the presidential address by John G. Arnold, Jr. (Loyola). His topic was "The fate of our junior scientists."

A. M. WINCHESTER,
Program Chairman

Junior Scientists' Assembly

At the 14th annual Junior Scientists' Assembly, held in the auditorium of the American Museum of Natural History on 27 December, each of the first 500 "early birds" received a copy of a Science Study Series paperback donated by Doubleday and Company.

Miss Evelyn Morholt welcomed the audience of some 1100 students (and some parents). Donald Barr (School of Engineering, Columbia) spoke on the "Image of the scientist."

Two students reported on their own research, conducted at Roscoe Jackson Memorial Laboratory: Judy Dick (Erasmus High School) described her work on learning in mice and on socialization of puppies; Robert Kamen (Andrew Jackson High School) told of the effects of nitrogen mustards on congenital deformities in mice and used slides to illustrate his talk. John Fuller, assistant director of the student-training program, described the objectives of the laboratory program for high school students, emphasizing the opportunity the program gives them to read original sources and do creative work.

Barr described the objectives of the Saturday Honors Program in Science, sponsored by the School of Engineering at Columbia University, and two students in this program described their work. Michael Steinitz (Harrison High School) described work on sapphire crystals and Erwin Morton, Jr., (Horace Mann High School) spoke of problems of thrust and fuels for rockets.

Conrad Ronneberg described the aims of the National Science Foundation in providing summer science institutes for high school students and described the kinds of courses to be offered in 1961.

During a closing question period, students (and some parents) asked questions about the supervision of students in out-of-town National

Completely revised and rewritten to give your students the most up to date and most complete coverage of the subject in a book of its size.

Ready in March!

New 14th Edition

Tuttle-Schottelius

TEXTBOOK OF PHYSIOLOGY

- new applications to exercise, nutrition
- new emphasis on interdependence of organs
- new material on muscles, nerves, body weight
- new illustrations, tables, format

The entirely redesigned and modernized new 14th edition of this remarkably clear, concise and popular text provides probably the most complete coverage of the subject for a book of its size. It is designed as an undergraduate text for use in colleges and other schools in fields allied to medicine. This edition welcomes the addition of Byron A. Schottelius, Ph.D. as co-author. It incorporates many recently developed concepts relating to all the systems of the human body.

By W. W. TUTTLE, Ph.D., Sc.D. and BYRON A. SCHOTTELIUS, Ph.D. Ready in March. 14th edition, approx. 575 pages 6 3/4" x 9 3/4", 312 text illustrations, 5 color plates. About \$6.75.

*Gladly Sent to Teachers
for Consideration as
the Required Textbook
for Their Courses*

**The
C. V. MOSBY
Company**

**3207 Washington Boulevard
St. Louis 3, Missouri**

Science Foundation courses; about methods of selecting students for honors programs under the foundation; and about specific problems in the papers presented by the four students.

EVELYN MORHOLT,
Program Chairman

American Association of Scientific Workers (X2)

The American Association of Scientific Workers held a round-table discussion on "Obstacles to the Application of Science to Human Welfare," on 27 December. Topics discussed were the economic and social factors that impede possible applications of science to human welfare; the misdirection of science into destructive channels; and the responsibilities of scientists in removing these obstacles, furthering human welfare, and maintaining peace and human freedom.

The main speakers were Otto Nathan (New York University), who spoke on "Science and peace"; Theodor Rosebury (Washington University), who spoke on "Reflections on the crisis in medicine"; Nathan S. Kline (Rockland State Hospital, Orangeburg, N.Y.), who spoke on "Cybernetics and human welfare"; and William H. Meyer (U.S. Representative from Vermont), who spoke on "Deficiencies in science and man."

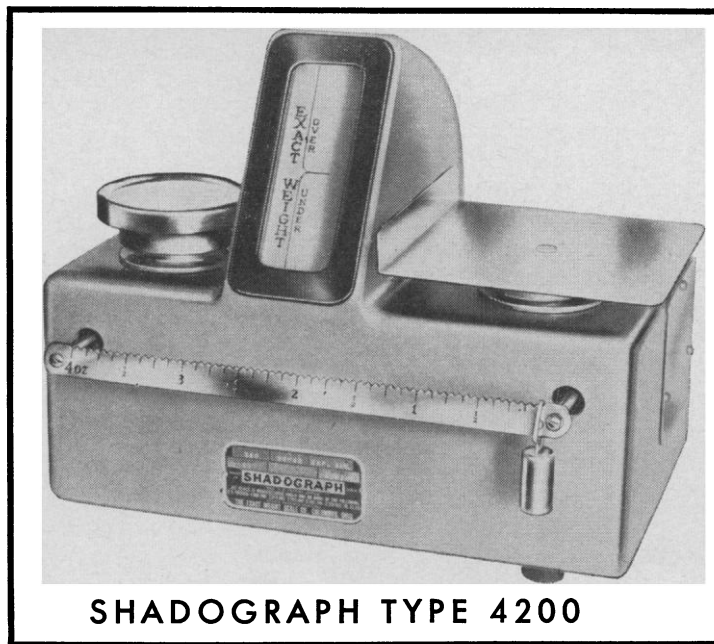
A period of discussion followed; members of the panel were David Singer (University of Michigan), Lawrence Scott (Fellowship of Reconciliation), and George Yevick (Stevens Institute of Technology).

MIRIAM L. YEVICK,
Program Chairman

American Geophysical Union (X4)

The symposium on the impact of space research on science was held 27 December in the Bowman Room of the Biltmore Hotel, with E. Purcell of Harvard University and Brookhaven National Laboratory presiding. The hall was filled to capacity.

Gordon MacDonald (University of California, Los Angeles; currently on leave to the Goddard Space Flight Center, National Aeronautics and Space Administration) led off the symposium with an excellent account of the relationship between the earth sciences and the space program. He surveyed



SHADOGRAPH TYPE 4200

Unequalled for versatility,
speed and visible accuracy . . .

SHADOGRAPH® BALANCE SAVES TIME IN COUNTLESS LABORATORY USES

FAST — The Shadograph comes to rest almost immediately.

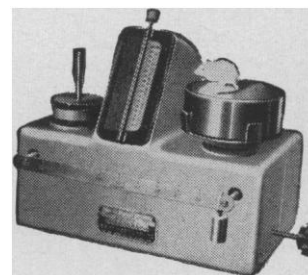
EASY TO READ — Light-beam projection indication provides a sharp shadow-edge reading on a frosted glass dial. Parallax reading is eliminated.

WEIGHS OUT-OF-LEVEL — The Shadograph is easily moved from one location to another; it weighs accurately without leveling; and is unaffected by normal vibration.

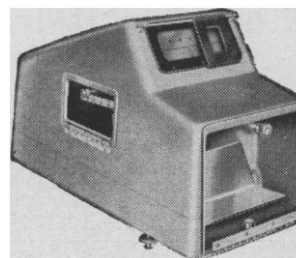
RUGGED — The Shadograph is a precision instrument, sturdily constructed and designed for utmost dependability in day-in-day-out laboratory use.

Models are available with visible sensitivity from one milligram (2000 milligrams capacity) to two grams (35 kilos capacity). We will be glad to demonstrate the time-saving advantages of the Shadograph in your laboratory. No obligation, of course. Write for our laboratory catalog.

OTHER SHADOGRAPH MODELS



MODEL 4203B-TC-SA,
SMALL ANIMAL BALANCE



MODEL 4142, TISSUE
AND TUMOR BALANCE



THE EXACT WEIGHT SCALE CO.
901 W. FIFTH AVE., COLUMBUS 8, OHIO
In Canada: 5 Six Points Road, Toronto 18, Ont.

Sales and Service Coast to Coast



the geodetic data resulting from the satellite orbit analyses and the implications of the satellite results for the structure of the earth's interior. He discussed the satellite meteorology program, emphasizing the importance of infrared detectors in future NASA weather satellites, as opposed to the cloud-cover photographs on which emphasis was placed in the preliminary Tiros operation. MacDonald also discussed the determination of atmospheric properties from the analysis of satellite orbits. He pointed to the pos-

sibility of a magnetic drag as a source of the fluctuations in satellite deceleration at altitudes above 400 kilometers.

In the second lecture, Philip Abelson, director of the Geophysical Laboratory of the Carnegie Institution, discussed the suitability of extraterrestrial environments for the growth of living organisms. Abelson summarized the available body of information on the atmospheres of the moon, Mars, and Venus, in the context of conditions known to be suitable for the development of living organisms on earth. He

stressed the improbability of finding living organisms on or near the surface of the moon, in view of the almost certainly dehydrated condition of the surface of that body. He considered it probable that the surface of Venus is also barren, as a consequence of the high temperatures which have been reported for that planet by radio astronomers. Abelson concluded with a critique of the evidence for the existence of living organisms on Mars. He pointed out alternative explanations in terms of reactions involving inert substances only.

In the concluding lecture, Martin Schwarzschild, of the department of astronomy, Princeton, discussed some of the benefits which would accrue to astronomy from the availability of orbiting telescopes. Schwarzschild envisioned that almost every field of astronomy would benefit substantially from the space program. One of the more fundamental problems that he discussed pertains to the amount of matter in the universe. There is indirect evidence for the existence of some ten times more matter than can be directly observed by currently available techniques. It is a matter of the greatest interest and importance to determine whether nine-tenths of the matter in the universe is in fact unaccounted for as yet, and if this is the case, what the composition of this missing matter may be. Current speculations center on the possibility that the unseen matter may be molecular hydrogen or deuterium. It is expected that the answer to this question will be obtained when satellite telescope spectrographs become available, a few years hence. Schwarzschild also discussed several questions of general interest to the scientific community, including the relative merits of manned and unmanned space exploration and the general benefits which may accrue to science as a whole from the investigations now being undertaken in support of space research.

ROBERT JASTROW, *Program Arranger*

American Nature Study Society (X5)

The 53rd annual meeting of the American Nature Study Society had a program indicative of the American people's increasing interest in interpretive nature programs for their schools. Sessions on outdoor laboratories, on nature projects of members, and on glaciation, and the showing of



DISPOSABLE CULTURE PLATES IN INDIVIDUAL STERILE BAGS* STREP plates... STAPH plates... or whatever the media... negative and

positive controls are run on each lot. When you take a PRE-MED culture plate from its bag you know it's sterile... you know a selective medium has the desired growth supporting properties and a differential medium has the desired growth inhibiting properties. This dependability makes PRE-MED plates the perfect controls for those plates you make yourself... and an economical way to solve your whole culture plate problem. PRE-MED culture plates are ready to use—just streak them. No mess... no guess... a perfect plate every time. Available in a variety of media, in MONO-PLATE®, BI-PLATE® and TRI-PLATE® Culture Plates.

<p>PRE-MED® Holding (Transport) Medium</p> <p>A non-nutrient medium which neither inhibits nor enhances growth of bacteria. Specimens taken during the night or on week-ends may be held until culture facilities are available.</p>	<p>PRE-MED® closed-system Blood Culture Bottles</p> <p>The modern way to collect and culture blood and body fluids. Bottles contain 50 cc Trypticase® Soy Broth with CO₂ added, a medium capable of revealing growth of many types of organisms at their earliest stages. Specimens may be collected aerobically or anaerobically.</p> <p><small>*Trypticase is a Trademark of Baltimore Biological Laboratory, Inc.</small></p>
---	--

Send for complete list of PRE-MED culture plates and culture products.

For further studies of isolates, try Hyland streptococcus grouping serum, Hyland *Haemophilus influenzae* typing serums and Hyland coagulase plasma.

*U.S. Patent No. 2,874,091

HYLAND LABORATORIES

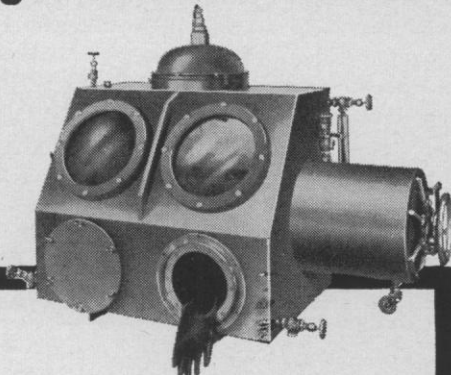
4501 Colorado Blvd., Los Angeles 39, Calif.
160 Lockwood Ave., Yonkers, N. Y.



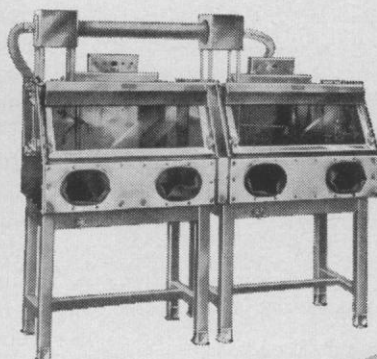
22 types of SAFETY ENCLOSURES for handling hazardous substances

VACUUM DRY BOX

for work in controlled atmosphere
• sloping front
• round autoclave-type air lock.



Safety is the first consideration in this newly-designed stainless steel laboratory equipment. These enclosures make it safer—and easier—for the technician to work with contaminants, micro-organisms, live viruses, infected animals, poisonous and radioactive substances. Stainless steel constructed with crevice-free surfaces, generously rounded corners, for easy cleaning and decontamination. Write for illustrated folder describing 22 different kinds of enclosures. S. BLICKMAN, INC., 6902 GREGORY AVENUE, WEEHAWKEN, N. J.

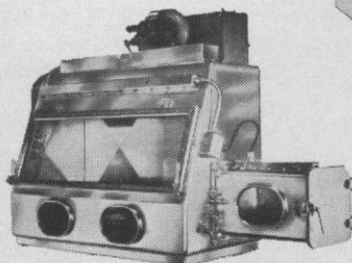
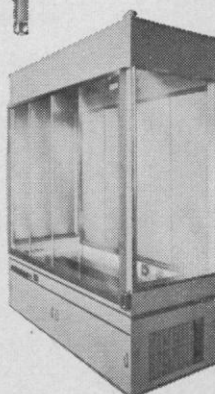


UNITIZED ENCLOSURES

Low in cost •
Stainless steel
• Modular
construction
adapts to many
uses.

CALIFORNIA-TYPE FUME HOOD

For handling radioactive materials • dual-sided for double operation.



MICRO-BIOLOGICAL SAFETY CABINET

Back or top mounting of biological filter canister • air lock if wanted.

BLICKMAN SAFETY ENCLOSURES

Look for this symbol of quality 

Hot Cold
Dry Humidified

MODEL 1280



CONTROLLED ENVIRONMENTAL ROOMS

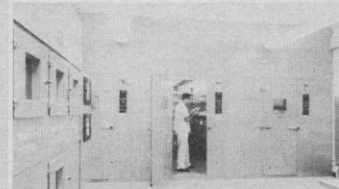
Hotpack prefabricated-portable rooms are being employed for a multitude of scientific uses by hospitals and universities and by companies such as Ciba Pharmaceutical, H. J. Heintz, Lever Bros. and Standard Oil, just to mention a few.

standard environmental conditions

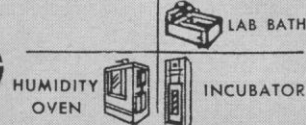
Heated Rooms above ambient to 125°C.
Refrigerated Room below ambient to 0°C.
Heated and Refrigerated Rooms from 0°C to 60°C.
Humidified Rooms, Heated or Refrigerated 30% to 98% R.H.
Humidified Rooms, Heated and Refrigerated 20% to 98% R.H.
Humidified Rooms, with Dehumidification 10% to 98% R.H.
Dehumidified Rooms, Heated or Refrigerated 5% to 20% R.H.
Special sizes-shapes and conditions supplied on request.

- All rooms are predesigned, prefabricated, prewired and pretested at the factory . . . constructed in modular units for inexpensive future expansion or contraction.
- Rooms are fabricated in sections to permit easy assembly on location . . . no complex blueprints or labor problems . . . reduces costs, facilitates disassembly for moving.
- Standard rooms up to 60 sq. ft. of working space . . . larger units available with special doors and construction features.

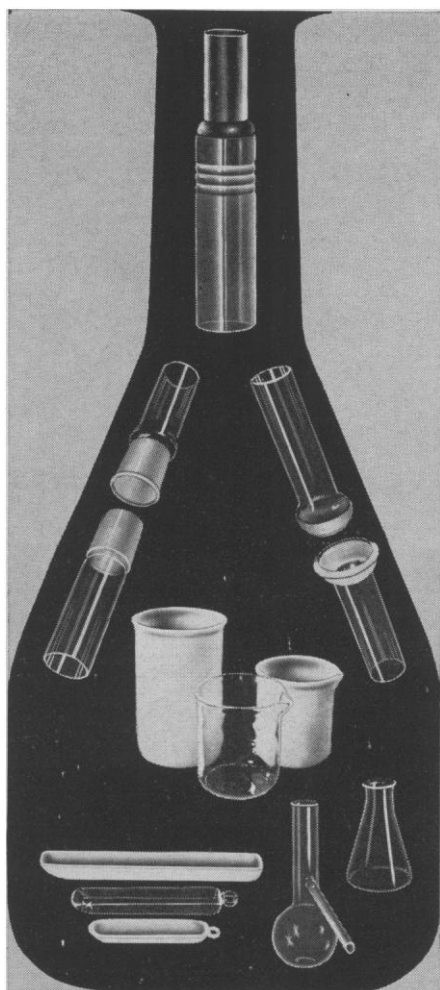
Special sizes, shapes to your requirements.



For detailed room information write to:



THE ELECTRIC HOTPACK CO., INC.
5086 COTTMAN AVENUE • PHILA. 35, PA.



VITREOSIL®

PURE FUSED QUARTZ

FOR USE IN PRODUCTION OF SEMI-CONDUCTOR METALS...

Where you produce such metals as germanium and silicon, VITREOSIL is ideal for use. For special requirements or special problems, write us your requirements. Now available Quartz to metal seals. See our ad in Chemical Engineering, Electronic Engineers Master & Electronic Designers' Catalogues.

SPECTROSIL®

FOR HYPER-PURITY IN SEMI-CONDUCTOR WORK

Unique Transmission characteristics

PURITY—purest form of fused silica

TRANSPARENCY—unique optical properties

HOMOGENEITY—completely homogeneous and free from granularity

AVAILABILITY—block material for lenses, prisms, etc; rod, fiber, wool; hollow ware as tubing, crucibles, and special apparatus.

Write for complete illustrated catalog.



**THERMAL AMERICAN
FUSED QUARTZ CO., INC.**
18-20 Salem St., Dover, N. J.

kodachromes, attracted over 100 people.

The field trip to the Brooklyn Botanical Gardens, jointly sponsored by the Society and the National Association of Biology Teachers, was led by Charles Mohr and Shirley Miller. At the gardens, Frances Miner and George Avery, aided by staff members and children, explained and demonstrated their youth program.

Approximately 80 members and guests attended the annual banquet, arranged by John Ripley Forbes. Emery L. Will, president, introduced the speaker, Edwin Way Teale, who gave an illustrated talk on his *Journey Into Summer*.

On the last morning a joint session, arranged by Mohr, with the Photographic Society of America centered on new approaches, techniques, and evaluation in nature photography. During the final session a panel discussed writing, illustrating, and publishing for the nature audience.

The council held four meetings. Eva L. Gordon and C. M. Goethe were made honorary life members in recognition of their service to the cause of nature education. E. L. Palmer was re-appointed representative to the AAAS Council. A committee was appointed to develop, in cooperation with the American Camping Association, criteria for certification of nature counselors. It was also planned to expand the services of the society through its newsletter and through development of a broader interpretive program at the local level.

STANLEY MULAİK, *Program Arranger*

Conference on Scientific Manpower (X7)

This year's general topic for the conference was "Developing Student Interest in Science and Engineering." Five papers were presented, in a morning session on 27 December.

Samuel Schenberg (New York City Board of Education) served as conference chairman. Harold H. Edgerton (Richardson, Bellows, Henry and Company) discussed "Summer research experience for high school students." John C. Flanagan (American Institute of Research) discussed the development of scientific aptitude tests and "Project Talent" as a means of identifying scientific abilities in high school students. M. H. Trytten and Lindsey Harmon of the National Research Council reported on a recent

OFFICIAL PUBLICATIONS FROM BRITAIN

THE COMPOSITION OF FOODS by R. A. McCANCE and E. M. WIDDOWSON.

Tables showing the amounts of the calorific content and body building constituents and minerals in foods analyzed in the raw state as well as prepared for consumption. Chapters on vitamins in foods, and on the amino-acid composition of the main protein foods.

252 pp. bibliog.

\$5.60

SELECTED ABSTRACTS OF ATOMIC ENERGY PROJECT UNCLASSIFIED REPORT LITERATURE IN THE FIELD OF RADIATION CHEMISTRY AND BIBLIOGRAPHY OF UNPUBLISHED LITERATURE

Fourth annual supplement of papers up to December 1959, compiled by R. W. Clarke, Chemistry Division, Atomic Energy Research Establishment, Harwell.

497 pp.

\$11.85

INTERFEROMETRY

Papers read before the 11th International Symposium held at the National Physical Laboratory, June 1959.

471 pp. Illus., charts, bibliog.

\$5.60

THE HAZARDS TO MAN OF NUCLEAR AND ALLIED RADIATIONS

A report by a Committee of the Medical Research Council.

154 pp., bibliog.

\$1.35

BRITISH COMMONWEALTH COLLECTIONS OF MICROORGANISMS. DIRECTORIES OF COLLECTIONS AND LISTS OF SPECIES. 5 vol.

United Kingdom, Ghana and Trinidad

70 pp.

\$2.40

Canada

48 pp.

\$1.70

Australia

45 pp.

\$1.55

New Zealand

16 pp.

60¢

COLONIAL RESEARCH 1959-60

A survey of the year's research including reports on locust research and control, pesticides, tsetse and trypanosomiasis.

380 pp.

\$3.20

HANDBOOK OF AVIATION METEOROLOGY

A handbook for the use of pilots and navigators at flying training schools.

404 pp., charts, bibliog.

\$4.70

BRITISH INFORMATION SERVICES

45 Rockefeller Plaza
New York 20, N.Y.

Agents for H.M. Stationery Office

study of the high school backgrounds of recipients of doctoral degrees in 1958, from the standpoint of ability levels, region, class size, and field of study. Phoebe H. Knipling (Arlington County, Virginia, Public Schools) discussed the beneficial motivational aspects of science fairs. Finally, Richard T. Fallon (Michigan State University) described the program of the Junior Engineering Technical Society.

The conference was sponsored by the Engineering Manpower Commission, the Scientific Manpower Commission, the National Research Council, the National Science Foundation, and AAAS Section M. Papers delivered at the conference will be published and will be available in limited numbers from the National Science Foundation, Washington, D.C.

THOMAS J. MILLS, *Program Chairman*

National Association of Science Writers (X9)

Earl Ubell, president, conferred honorary membership certificates on Henry A. Wallace, Warren Weaver, and Paul Dudley White for exceptional cooperation in communicating science news to the public.

Lifetime membership certificates were awarded to Watson Davis, David Dietz, Thomas R. Henry, William L. Laurence, Herbert B. Nichols, Robert D. Potter, Allen Shoenfield, Jane Stafford, and Marjorie van de Water.

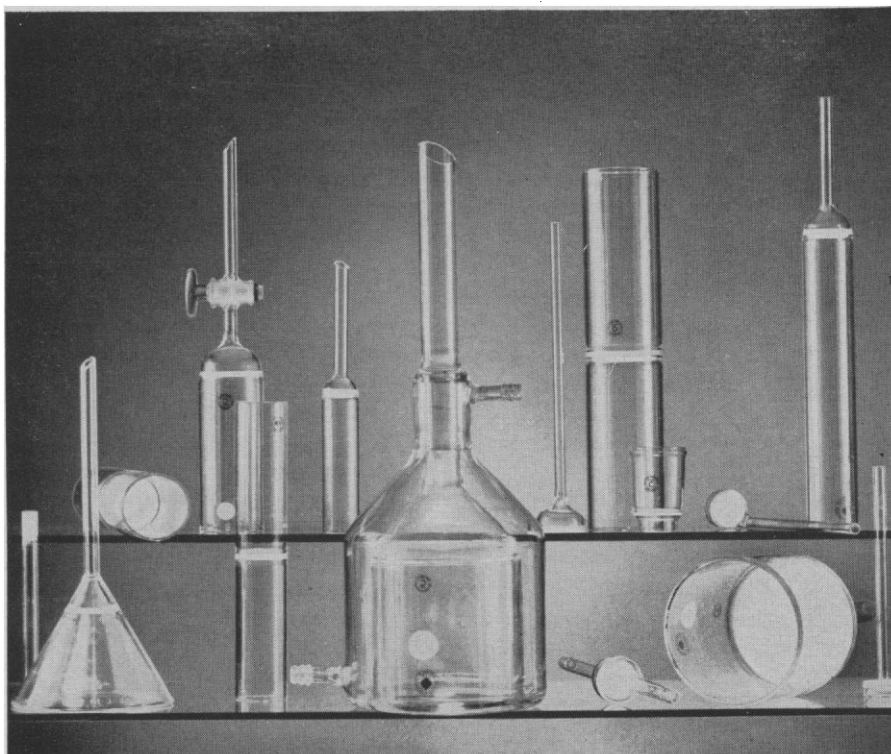
Watson Davis, director of Science Service, was named the association's 1960 nominee for the Kalinga prize, international award for popularizing science.

The members authorized an increase in annual dues from \$10 to \$15 and publication of a sample issue of what may become a regular supplement to the NASW *Newsletter*, to include samples of current newspaper and other science writing throughout the country. The members also authorized consideration of an amendment to open associate membership to those who spend a "substantial" rather than a "principal" part of their time in science communication.

VICTOR COHN, *Vice President*

The National Association of Science Writers' annual dinner and presentation of the AAAS-Westinghouse science-writing awards was staged 27 December in the East Ballroom of the Hotel Commodore. Earl Ubell, NASW

17 FEBRUARY 1961



WHY SELECT ACE FIBER GLASS SINTERED FILTERS?

Quality and Greater Abrasion Resistance. Ace filters, the first American made sintered glass filters, feature a glass fiber structure, more abrasion resistant because it is fused together on a larger area. Particles do not detach from the filter body as easily as spherical granules. The shock and chemical attack resistance of glass is unimpaired as the Ace fiber glass sintered filter is made entirely of glass. You are assured of Ace Glass quality: each filter plate is *individually* tested for porosity and hardness.

Selection and Economy. Ace fiber glass sintered filters are economically priced. For instance, the Filter Funnel (Cat. #7305 in the 20 ml. cap. with 20 mm. disc), shown in photograph above, is listed at \$3.20. Ace fiber glass sintered filters have been incorporated into a wide variety of Ace glassware described in our new filterware brochure. Get it for your files!

Write Dept. S for your copy of Filterware Brochure No. 6050.

ACE GLASS

INCORPORATED

Louisville, Ky.,
Vineland N. J.
Springfield, Mass.

Circle No. 527 on Readers' Service Card

president and science editor of the New York *Herald Tribune*, presided.

Ubell also was recipient of the \$1000 newspaper division award for non-medical science writing. Philip Morrison, Cornell University physicist, received a similar award in the magazine division.

William Hines, of the Washington, D.C., *Evening Star*, and Edwin Diamond, science editor of *Newsweek*, were given honorable mention certificates in the newspaper and magazine divisions, respectively.

NATE HASELTINE, *Secretary-Treasurer*

Meetings

Forthcoming Events

March

12-17. American College of Allergists, annual, Dallas, Tex. (P. Gottlieb, 818 Medical Arts Bldg., Philadelphia, Pa.)

13-17. National Assoc. of Corrosion Engineers, annual, Buffalo, N.Y. (W. A. Mapler, 18263 W. McNichols Rd., Detroit 19, Mich.)

13-24. Radiological Health, course in, Cincinnati, Ohio. (Chief, Training Program, Sanitary Engineering Center, 4676 Columbia Parkway, Cincinnati 26)

14-16. Clinico-Pathological Significance of Renal Biopsy, Ciba Foundation symp. (by invitation only), London, England. (Ciba Foundation, 41 Portland Place, London, W.1)

14-16. Inter-Station Supersonic Track Conf., 6th symp., China Lake, Calif. (U.S. Naval Ordnance Test Station, Code 307, China Lake, Calif.)

15-17. Medical Photography and Cinematography, intern. cong., Cologne, Germany. (Deutsche Ges. für Photographie, Neumarkt 49, Cologne)

16-17. Textile Engineering Conf., American Soc. of Mechanical Engineers, Clemson, S.C. (ASME Meetings Dept., 29 W. 39 St, New York 18)

16-18. Aviation/Space Education, 5th natl. conf., Washington, D.C. (Natl. Aviation Education Council, 1025 Connecticut Ave., NW, Washington 6)

17-19. International Medical Conf., Liège, Belgium. (Medical Commission of the FIR, Castellezgasse 35, Vienna II)

19-25. American Soc. of Photogrammetry, American Cong. on Surveying and Mapping, Washington, D.C. (C. E. Palmer, ASP, 1515 Massachusetts Ave., NW, Washington 5)

19-25. Caribbean Region, American Soc. for Horticultural Science, 9th annual, Miami, Fla. (E. H. Casseres, Londres 40, Mexico 6, D.F., or W. H. Krome, Box 596, Homestead, Fla.)

20-22. American Physical Soc., Monterey, Calif. (W. A. Nierenberg, Univ. of California, Berkeley 4)

20-23. Institute of Radio Engineers, 1961 intern. convention, New York, N.Y. (E. K. Gannett, IRE, 1 E. 79 St., New York 21)

20-24. American Surgical Assoc., Boca Raton, Fla. (W. A. Altemeier, Cincinnati General Hospital, Cincinnati 29, Ohio)

20-24. National Health Council, forum and annual meeting, New York, N.Y. (NHC, 1790 Broadway, New York 19)

20-24. Western Metal Cong. and Exposition, 12th, Los Angeles, Calif. (A. R. Putnam, American Soc. for Metals, Metals Park, Ohio)

21-23. American Meteorological Soc., general meeting, Chicago, Ill. (E. P. McClain, Dept. of Meteorology, Univ. of Chicago, Chicago 37)

21-23. American Physical Soc., Division of High-Polymer Physics, 21st, Monterey, Calif. (D. W. McCall, Bell Telephone Laboratories, Murray Hill, N.J.)

21-23. American Power Conf., 23rd annual, Chicago, Ill. (W. C. Astley, Philadelphia Electric Co., 900 Sansom St., Philadelphia 5, Pa.)

21-24. American Assoc. of Anatomists, 74th annual, Chicago, Ill. (O. P. Jones, Dept. of Anatomy, Univ. of Buffalo, Buffalo 14, N.Y.)

21-30. American Chemical Soc., 139th, St. Louis, Mo. (A. T. Winstead, ACS, 1155 16th St., NW, Washington 6)

23-25. American Orthopsychiatric Assoc., 38th annual, New York, N.Y. (M. F. Langer, AOA, 1790 Broadway, New York 19)

23-25. Quantum Electronics, 2nd intern. conf., Berkeley, Calif. (J. R. Singer, Dept. of Electrical Engineering, Univ. of California, Berkeley 4)

23-26. International Assoc. for Dental



DU PONT REAGENTS

give reproducible results, bottle after bottle

You can depend on reproducible results with Du Pont Reagents bottle after bottle, shipment after shipment. Du Pont continuously runs its reagents through 113 separate analytical tests to keep them uniform for your most stringent requirements.

To help you too, they're always of the highest purity, exceeding American Chemical Society standards. And you get the convenience of single-trip cartons, dripless sleeves, safety grips on 5-pint bottles, and color-coded caps and labels.

Du Pont Reagents are readily available all over the country. Ask your local laboratory supply house or write for list of suppliers. Industrial & Biochemicals Department, N-2545-S, Wilmington 98, Delaware.

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY



NO lost experiments with

MICROSCOPIC SLIDE LABELING



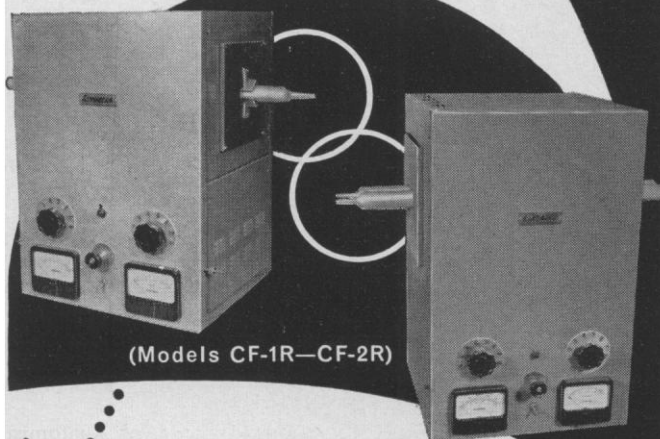
Eliminate guesswork . . . greasemark mistakes. Get positive identification. Simply pull tab and a fresh, clean label "pops" out. Fast, self-sticking labels dispensed one at a time. Available in standard or "tissue-high" thickness. They accept pen, pencil, ball point pen or typewriter marking. 1000 labels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



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

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

COMBUSTION TUBE FURNACES



(Models CF-1R—CF-2R)

by **LINDBERG**

These furnaces provide low cost, dependable operation at continuous temperatures up to 2650° F. to meet requirements of all combustion tube methods of carbon and sulfur analysis on ferrous, non-ferrous and petroleum samples. Write for Bulletin No. 1071 for full details.

Sold only through laboratory equipment dealers

Lindberg Laboratory Equipment Division
LINDBERG ENGINEERING COMPANY
2494 West Hubbard Street, Chicago 12, Illinois

Automatic Protein and/or Peptide Analyses

(Either Individual Samples or Column Effluent)

Quantitate...

- Total Nitrogen by Kjeldahl
- Total Protein by Biuret
- Total Protein by Folin—Ciocalteu
(Lowry modification)
- Amino Groups by Ninhydrin
- Tyrosine by Folin—Ciocalteu
- Histidine by Pauly Diazo Reaction
- Arginine by Sakaguchi
- Glutamic Acid by Decarboxylase
- Lysine by Decarboxylase
- Albumin by HABA Dye
[2-(4' hydroxyazobenzene) benzoic acid]

Analyze...

- Biological Fluids directly
- Effluent from DEAE or Resin Chromatographic Column
- Effluent from Poraeth Electrophoretic Column
- Electrophoretic Starch Block Fractions
- Electrophoretic Paper Chromatogram Segments
- Check point stages in Protein Fractionation
- Counter Current Distributions

with the **TECHNICON®**

AutoAnalyzer®

Any or all of these determinations may be run on the same AutoAnalyzer: Takes only two minutes to change from one type of analysis to another. Any combination may be run simultaneously from the same sample by adding additional standard AutoAnalyzer modules. The response time is such that most of the analyses may be run at 40 samples per hour.

for information, select area of interest and write to

TECHNICON CHROMATOGRAPHY CORP.
42 RESEARCH PARK • CHAUNCEY, NEW YORK

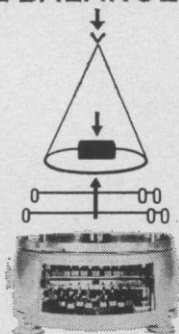
**EASIEST TO
OPERATE**



SAUTER *Monopan* ANALYTICAL BALANCE

EXCLUSIVE

Monopan weights are in the bottom. Unlike other balances with weights on top, Monopan has no unnecessary swing. With Monopan, all downward force is compensated by equal upward thrust. Since weights are situated within the angle prescribed by pan, oscillation is minimized.



A single pan Analytical Balance making most efficient use of the reliable principle of substitution weighing for the determination of mass.

Very precise • Extremely stable • Remarkably simple.

Several exclusive features:

- Three position arrestment system provides positive locking of weight exchange in "free weighing" position.
- Load pan and substitution weights on separate stirrups minimize oscillation.
- Suspended side sliding doors. No dust-trapping grooves.
- No obstructive front corner posts.
- All controls at base. Operator can rest and steady forearm on table.

Cap.	200 grams
Tare Cap. (add.)	30 grams
Range of opt. scale	110 mg
Readability (per vernier div.)	0.1 mg
Accuracy diff. weighings within opt. range	0.03 mg
Size:	10½" x 18" x 18"
Net Wt.:	45 lbs.
Shipping Wt.:	57 lbs.

Write for Illustrated Literature



AUGUST SAUTER OF N.Y., INC.
866 WILLIS AVENUE
ALBERTSON, L. I., N. Y.
Pioneer 6-254

Research, 39th annual, Boston, Mass. (D. Burrill, IADR, 311 E. Chicago Ave., Chicago 11)

24-29. National Science Teachers Assoc., Chicago, Ill. (R. H. Carleton, NSTA, 1201 16th St., NW, Washington 6)

26-29. American Assoc. of Dental Schools, annual, Boston, Mass. (R. H. Sulens, 840 N. Lake Shore Dr., Chicago 11)

27-31. Temperature—Its Measurement and Control in Science and Industry, natl. symp., Columbus, Ohio. (C. M. Herzfeld, Natl. Bureau of Standards, Washington 25)

30-1. Southern Soc. for Philosophy and Psychology, Atlanta, Ga. (D. R. Kenshalo, Dept. of Psychology, Florida State Univ., Tallahassee)

April

3-6. Massachusetts Institute of Technology, centennial celebration, Cambridge. (Office of Public Relations, M.I.T., Cambridge 39)

3-15. Medical Conference, 11th, Nassau, Bahamas. (Bahamas Conferences, P.O. Box 1454, Nassau)

4-6. Electromagnetics and Fluid Dynamics of Gaseous Plasma, intern. symp., New York, N.Y. (J. Fox, Microwave Research Inst., Brooklyn 1, N.Y.)

4-7. Society of Automotive Engineers, natl. aeronautic meeting, New York, N.Y. (E. W. Conlon and G. W. Periman, 485 Lexington Ave., New York 17)

4-8. National Council of Teachers of Mathematics, 39th annual, Chicago, Ill. (F. A. Janacek, J. S. Morton High School, Cicero 50, Ill.)

5-8. Water Relations of Plants, British Ecological Soc., symp., London. (F. H. Whitehead, Botany Department, Imperial College, Prince Consort Road, London, S.W.7)

6-7. Council on Medical Television, annual, Bethesda, Md. (Institute for Advancement of Medical Communication, 33 E. 68 St., New York 21)

7-8. Eastern Psychological Association, Philadelphia, Pa. (C. H. Rush, P.O. Box 252, Glenbrook, Conn.)

7-9. American Assoc. for Cancer Research, 52nd annual, Atlantic City, N.J. (H. J. Creech, Secretary-Treasurer, Inst. for Cancer Research, Fox Chase, Philadelphia 11, Pa.)

7-9. Fleming's Lysozyme, 2nd intern. symp., Milan, Italy. (R. Ferrari, Organizing Committee, Via Modica 6, Milan)

8-9. Histochemical Soc., 12th annual, Atlantic City, N.J. (H. W. Deane, Albert Einstein College of Medicine, Bronx 61, N.Y.)

9-13. American Assoc. of Cereal Chemists, annual, Dallas, Tex. (J. W. Pence, Western Utilization Research & Development Division, 800 Buchanan St., Albany 10, Calif.)

9-13. American Industrial Hygiene Assoc., Detroit, Mich. (W. S. Johnson, Bethlehem Steel Co., Bethlehem, Pa.)

9-15. American Institute of Nutrition, Atlantic City, N.J. (A. E. Schaefer, ICNND, Bldg. 16A, National Institutes of Health, Bethesda 14, Md.)

10-14. American Soc. of Civil Engineers, Phoenix, Ariz. (W. H. Wisely, 33 W. 39 St., New York 18)

10-14. Detection and Use of Tritium in the Physical and Biological Sciences, intern. symp., Vienna, Austria. (Office of Special Projects, U.S. Atomic Energy Commission, Washington 25, D.C.)

10-15. Federation of American Societies for Experimental Biology, 45th annual, Atlantic City, N.J. (M. O. Lee, 9650 Wisconsin Ave., Washington 14, D.C.)

10-15. Metallic Corrosion, 1st intern. cong., London, England. (Society of Chemical Industry, 14 Belgrave Sq., London, S.W.1)

11-13. Institute of Environmental Sciences, annual, Chicago, Ill. (H. Sanders, Box 191, Mt. Prospect, Ill.)

11-13. Ultrapurification of Semiconductor Materials, conf., A.F. Office of Scientific Research, Boston, Mass. (Miss H. Turin, Conf. Secretary, Electronics Research Directorate, Air Force Cambridge Research Lab., L. G. Hansom Field, Bedford, Mass.)

12-13. Information and Decision Processes, 3rd symp., Lafayette, Ind. (R. E. Machol, School of Electrical Engineering, Purdue Univ., Lafayette)

12-14. Agglomeration, intern. symp., Philadelphia, Pa. (Metallurgical Soc. of the AIME, 29 W. 39 St., New York 18)

12-14. Chemical Soc., anniversary meeting, Liverpool, England. (Chemical Society, Burlington House, Piccadilly, London, W.1)

13-14. Society of Technical Writers and Publishers, 8th annual, San Francisco, Calif. (R. B. Meier, Head Editor, Engineering, Stanford Research Inst., 333 Ravenswood Ave., Menlo Park, Calif.)

17-18. Great Lakes Research, 4th conf., Ann Arbor, Mich. (C. F. Powers, Great Lakes Research Division, 1119 Natural Science Bldg., Ann Arbor)

17-19. Fluid Seal Meeting, intern., Ashford, Kent, England. (Information Officer, British Hydromechanics Research Assoc., South Road, Temple Fields, Harlow, Essex)

17-24. International Congress of Nurses, 12th quadrennial cong., Melbourne, Australia. (Miss D. C. Bridges, Secretary, 1 Dean Trench Street, London, S.W.1, England)

18-20. Chemical Reactions in the Lower and Upper Atmosphere, intern. symp., San Francisco, Calif. (R. D. Cadle, Stanford Research Inst., Menlo Park, Calif.)

18-21. American Geophysical Union and American Meteorological Soc., Washington, D.C. (American Geophysical Union, 1515 Massachusetts Ave., NW, Washington 5, D.C.)

19-21. Southwestern Inst. of Radio Engineers Conf. and Electronics Show, Dallas, Tex. (SWIRECO 61, P.O. Box 7443, Dallas 9)

20-21. Society of Chemical Industry, fungicide symp., London, England. (B. J. Heywood, 103 Harrow Drive, Hornchurch, Essex, England)

20-22. Association of Southeastern Biologists, Lexington, Ky. (H. J. Humm, Department of Botany, Duke Univ., Durham, N.C.)

20-24. Microbial Reactions in Marine Environments, intern. symp., Chicago, Ill. (C. H. Oppenheimer, Inst. of Marine Science, Univ. of Texas, Port Arkansas)