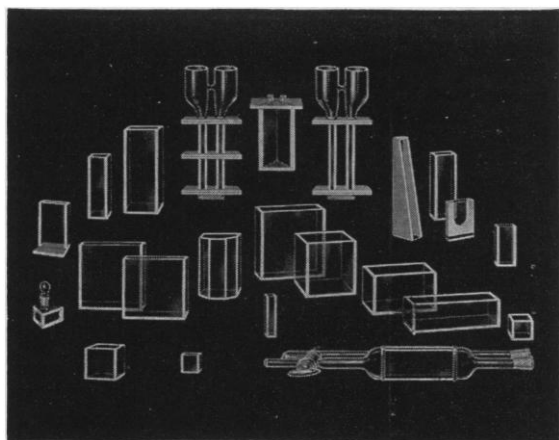


# GLASS ABSORPTION CELLS made by **KLETT**



Makers of Complete Electrophoresis Apparatus

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

**Klett Manufacturing Co.**

179 East 87 Street, New York, New York

## \*\*\*\*\* SCIENCE-1957 \*\*\*\*\* ON MICROCARDS

The response to the Microcard edition has encouraged us to make Volumes 125 and 126 of SCIENCE available in this form.

Eighty-five 3" x 5" cards contain 1946 pages of SCIENCE for the year 1957.

The space-saving is considerable—25 sets of Microcards take up approximately the same space as a single bound volume of SCIENCE covering the same period. The bother and expense of binding are completely eliminated. The price remains unchanged—\$7.50 per volume, \$15.00 per year. The Microcard edition of SCIENCE is now available from 1953 through 1957.

**AAAS**

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

# new **ECONOMY** **MODEL "U"** **CAMERA**

for the limited budget



Features the standard back for 4" x 5" graphic film and plate holder. Polaroid adapter and 35 mm.

For Micro, low power and Macro photography. Priced from \$265.00. Immediate delivery.

# BRINKMANN

INSTRUMENTS, INC.

BRINKMANN HOUSE, Cutter Mill Road, Great Neck, L.I.

NEW YORK

PHILADELPHIA

CLEVELAND

HOUSTON

# FREE *samples*

## *of E-D filter paper for Chromatography and Electrophoresis*

Readily available in a variety of grades and sizes

Of the 33 grades of filter paper that are regularly produced in Filtertown, most possess the high degrees of uniformity and purity, that are essential characteristics for filter paper selected for use in chromatography or electrophoresis.

In point of fact, E-D filter papers are most favorably known for dependability, neutrality, and low ash content.

For two dimensional chromatography and electrophoresis—the most popular grades are 301, 609, 613 and Purity 7. They represent the thin, medium, and heavy grades which provide rapid, medium, or slow flow. Usually purchased in sheets. All sizes can be supplied including, of course, the very popular 18¼" x 22½".

For single dimensional chromatography, rolls or strips are most frequently used. Rolls up to 12" wide are ordinarily supplied in lengths of 600 feet. Strips from ½" to 12" wide, 22" long. Other sizes available.

We have prepared a Sample Kit for your use to help you determine which grade—or grades—suit your purposes best. *No charge or obligation.* Simply send in the coupon below and we will promptly forward this Sample Kit to you.



*The Eaton-Dikeman Company*

FILTERTOWN  
MT. HOLLY SPRINGS, PENNA.

THE EATON-DIKEMAN COMPANY  
FILTERTOWN  
MT. HOLLY SPRINGS, PENNA.

578

☐ Send me the Sample Kit of E-D filter papers for Chromatography and Electrophoresis in sheets, 18¼" x 22½".

My name \_\_\_\_\_ Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

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

## Equipment

*The information reported here is obtained from manufacturers and from other sources considered to be reliable. Science does not assume responsibility for the accuracy of the information. A coupon for use in making inquiries concerning the items listed appears on page 1198.*

■ **WALK-IN ROOMS** for plant growing provide variable temperature, humidity, and illumination. Standard sizes available are 4 by 4, 4 by 6, and 4 by 8 ft; all are 7 ft high. Interiors are finished in white baked-on enamel. Ceilings are equipped with special fluorescent lights simulating sunshine. Rooms may be operated below and above ambient temperature; they can be supplied with or without shelving. (Labline Inc., Dept. 39)

■ **VOLTAGE-TO-DIGITAL CONVERTER** converts input voltage to four binary-coded decimal digits with accuracy of  $\pm 0.05$  percent one-half of the least significant binary digit. More than 3700 such conversions may be completed in 1 sec. Standard full-scale input ranges are  $\pm 10$ ,  $\pm 100$ , and  $\pm 1000$ . Range switching is accomplished by application of an external trigger pulse. Output can be read by means of neon indicators and is available in the form of parallel voltage levels that are either high or low in accordance with the binary code. (Epsco Inc., Dept. 41)

■ **CAPACITANCE INDICATOR** is a self-balancing instrument that automatically indicates capacitance and dissipation factor in an average time of 7 sec. Capacitance range is 100 pf to 1.1  $\mu$ f in four ranges, and dissipation factor is measured from 0 to 16 percent in three ranges. Range switching is automatic. The unit is available with digital read-out or with analog voltage read-out. (Barnes Development Co., Dept. 42)

■ **DIRECT-COUPLED FILTER** is a dual unit designed to provide high-pass and low-pass filtering with d-c response. The two units are interchangeable and can be interconnected. The individual section cut-off frequency is continuously adjustable over five decades from 0.2 to 20,000 cy/sec. Alternative d-c blocking inputs are provided. (Spectrum Instruments Inc., Dept. 45)

■ **AMMONIA-TYPE MASER OSCILLATOR** is a portable, sealed unit that generates a K-band frequency with stability better than 1 part in  $10^9$ . The instrument, a molecular-beam oscillator, can operate for more than 500 hours without breaking the vacuum seal. Replacement parts permit an additional 500 hr of operation. Shelf life is a minimum of 1 yr. The oscillator weighs 20 lb and occupies a volume of 1 ft<sup>3</sup>. (Polytechnic Research & Development Co., Inc., Dept. 62)

■ **LIQUEFIED-GAS LEVEL-REGULATOR** maintains level of liquid within 0.25 in. in cold finger or freezing bath of any apparatus. The device is based on an air thermometer made of glass. Rise of temperature of the thermometer actuates a mercury seal in a breather tube of the source of liquefied gas. The resulting build-up of pressure causes liquid to flow to raise the controlled level. (Fisher Scientific Co., Dept. 65)

■ **PAPER-CHROMATOGRAM SCANNER** handles either strip or two-dimensional chromatograms automatically, detecting beta-gamma emitting isotopes such as  $C^{14}$ ,  $S^{35}$ , and  $P^{32}$ , and, when operated as a proportional counter, alpha radiation. The instrument incorporates a detector, scaler, recorder, and scanning mechanism. A variety of traverse distances and scanning rates are provided. Once started, the unit completes the scanning operation and turns itself off. (Nuclear Measurements Corp., Dept. 50)

■ **ELECTRICALLY ACTUATED PRINTER** is capable of a maximum of 150 printing operations per minute with simultaneous entry of up to 14 digits. Up to 136 characters and spaces may be printed on a single line. The carriage can be programmed to tabulate fixed or variable distances after print-out. An accompanying control unit that provides proper pulse duration is capable of operating the printer over a source-voltage range of 100 to 125 v. (Monroe Calculating Machine Co., Inc., Dept. 56)

■ **DIFFERENTIAL - TRANSFORMER ACCELEROMETERS** are available in ranges from  $\pm 1$  to  $\pm 50$  g. Damping is temperature-compensated to 0.1 of critical, and resolution is infinite. Output at full scale is 0.5 v/v of excitation. Maximum non-linearity is 1.0 percent. Phase shift at 0 deg is  $\pm 5$  deg. Full scale outputs up to 60 v are obtainable. (Edcliff Instruments, Dept. 49)

■ **ENVIRONMENT TEST CHAMBER** comprises a 27-ft<sup>3</sup> altitude simulation chamber nested within a 53 ft<sup>3</sup> temperature-control chamber. The altitude chamber, which simulates altitudes to 200,000 ft, may be lifted out and used independently. The temperature chamber is usable in the range from  $-100^{\circ}$  to  $+400^{\circ}$ F. (Mantec Inc., Dept. 58)

■ **PH METER**, designed for industrial application, features automatic compensation for the change of slope of the pH-millivolt curve and the shift of zero with temperature. Stability of  $\pm 0.02$  pH units in 24 hours is said to be attained. A wide range of electrodes is available as well as auxiliaries such as electrode switching units and alarm units. (E. I. L. Instruments, Dept. 59)

■ **PARTICLE-SIZE ANALYZER** is designed to measure particles of size between approximately 0.1 and 40  $\mu$ . The instrument includes special centrifuge tubes and a tube-feeding chamber, an optical projector, and one or more centrifuges. A suspension of particles is transferred to the feeding chamber and thence into a centrifuge tube so as to produce a sharp layer of the suspension on the sedimentation liquid. A magnified image of the sediment column in the centrifuge tube is measured on the graduated screen of the projector. (Mine Safety Appliance Co., Dept. 52)

■ **GEAR-TRAIN ANALYZER** evaluates lost motion in precision gear trains used in instruments. The device substitutes a torque actuator for the motor drive of the gear train. The actuator applies constant torque to the input pinion of the locked gear train; clockwise and counter-clockwise displacement of the actuator shaft is indicated on a readout dial. The device also provides a means for determining the torque necessary to drive the gear train. (Daco Instrument Co., Dept. 61)

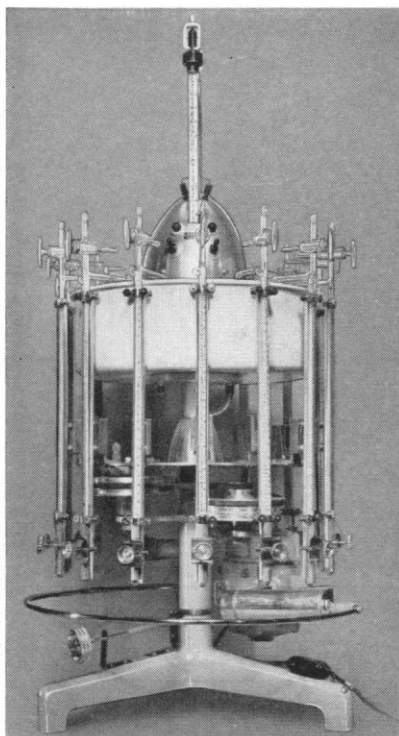
JOSHUA STERN

National Bureau of Standards

## THE "BRONWILL"\* Warburg

### most compact-most versatile

### Warburg Available



Model UV shown above, is a compact, circular unit, only 20½" diameter, 31" high, rotatable thru 320° permitting any of the manometers to be quickly read. Model UVL equipped for photo-chemical work.

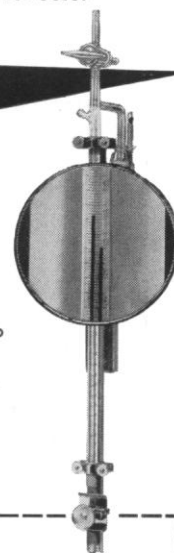
**Requires only  
20½" of Desk Space**

- Magnetic Temperature Setting.
- Highest Temperature Constancy  $\pm 0.01^{\circ}$  C.
- Cooling Coil Built In.
- Fastest to Set Up. Small bath (only 8 liters) heats from ambient to 37°C in 22 minutes.
- Rotatable thru 320°.
- Calibrated—Interchangeable Manometers & Vessels Available.
- Available for Photosynthesis.

**EASY TO READ**

**DOUBLE CAPILLARY  
MANOMETERS**

Single background scale—a sturdy single rod containing two capillaries. Available pre-calibrated—interchangeable—no more calibrating each time a piece is broken.



\*The trademark identifying products of Bronwill Scientific Division, Will Corporation.

**BRONWILL**  
SCIENTIFIC DIVISION  
WILL CORPORATION  
131 GOULD STREET  
ROCHESTER, N. Y.

BRONWILL SCIENTIFIC DIVISION  
WILL CORPORATION  
Box 127, Brighton Station, Rochester 10, N. Y., Dept. 685  
Please send full information on Bronwill Warburgs.

Name.....  
Position.....  
Company.....  
Address.....  
City..... Zone..... State.....

**NEW facilities at**  
**COLORADO SERUM CO.**  
 to meet your increased  
 requirements for  
**DIAGNOSTIC REAGENTS**

Our new building, fitted with the  
 most modern equipment, will help us meet  
 your needs for increased amounts of  
 non-toxic tested horse serum used in tissue  
 culture research.

Write today for **FREE** catalog  
 No salesman will call.

**COLORADO SERUM CO.**  
 PEAK OF QUALITY

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

**FARRAND®**



*Grating*  
**MONOCHROMATORS**

ULTRAVIOLET . . . . .220-440 mμ	High efficiency and resolution.
UV-VISIBLE . . . . .220-650 mμ	Suitable for a wide variety
VISIBLE . . . . .400-700 mμ	of applications. 8"x8"x4",
INFRARED . . . . .700-1400 mμ	weight 4 lbs.
INFRARED . . . . .700-2800 mμ	

For Complete details, Bulletin No. 811

**FARRAND OPTICAL CO., Inc.**  
 BRONX BLVD. & EAST 238th STREET • NEW YORK 70, N. Y.

Engineering	FOCI	Precision Optics,
Research • Development	TRADE MARK	Electronic and
Design • Manufacture		Scientific Instruments

## PERSONNEL PLACEMENT

**CLASSIFIED:** 25¢ per word, minimum charge \$4.25. Use of Box Number counts as 10 additional words. Payment in advance is required.

**COPY** for classified ads must reach **SCIENCE** 2 weeks before date of issue (Friday of every week).

**DISPLAY:** Rates listed below—no charge for Box number. Monthly invoices will be sent on a charge account basis — provided that satisfactory credit is established.

Single insertion	\$26.00 per inch
13 times in 1 year	24.00 per inch
26 times in 1 year	23.00 per inch
52 times in 1 year	22.00 per inch

For **PROOFS** on display ads, copy must reach **SCIENCE** 4 weeks before date of issue (Friday of every week).

Replies to blind ads should be addressed as follows:

Box (give number)  
 Science  
 1515 Massachusetts Ave., NW  
 Washington 5, D.C.

### POSITIONS WANTED

Biochemistry Technician able to set up routine clinical biochemistry laboratory. Box 117, **SCIENCE**. 5/9, 16

Clinical Chemist; Ph.D., 1952. Experienced clinical chemist with biochemical research and teaching experience desires challenging position with a university or general hospital laboratory. Publications. Box 131, **SCIENCE**. X

Editor-Writer, M.J.; Engineering, nuclear technology experience on reports, brochures, press-journal liaison, publications production. Seeks relocation. Box 135, **SCIENCE**. X

### POSITIONS WANTED

B.S. (major, organic chemistry), Ph.D. (major, biophysical chemistry; minor, microbiology); 6 years' teaching (largely biophysical chemistry, microbiology); 8 years, group leader, pharmaceutical company; 6 years, senior research scientist, university project. Medical Bureau, Burneice Larson, Director, 900 North Michigan, Chicago. X

Expert Medical Writing (monographs, clinical research papers, books); medical literary research (reviews, abstracts, bibliographies). Box 130, **SCIENCE**. X

Organic and Biological Chemist, Ph.D.; publications, patents; extensive teaching experience. Desires academic position. Box 134, **SCIENCE**. X

Ph.D., bacteriology; 5 years' experience also in cellular physiology, radioisotopes, biochemistry. Research or industrial position. Box 125, **SCIENCE**. 5/16, 23

Ph.D., Microbiologist-Immunochemist; experienced in enzymology, graduate teaching and industrial experience. Desires industrial or academic position. Box 133, **SCIENCE**. X

### POSITIONS OPEN

**NEW WORLD-WIDE SUMMER PLACEMENT DIRECTORY.** Thousands of opportunities in all states, many foreign lands for science teachers, and so forth, who have the summer free. Includes study awards, industry, camps, resorts, ranches, travel tour agencies, earning free trips to Europe, and so forth. Earn, learn, and travel while you vacation. Complete information, including salaries. Send \$2 now. **CRUSADE, Sci.**, Box 99, Station G, Brooklyn 22, N.Y. eow

### POSITIONS OPEN

Botanist, Ph.D.; to teach biology, cell physiology, research interest with electron microscope preferred. Southern university. Salary about \$5000. Box 132, **SCIENCE**. X

Botanist. Assistant professor; Ph.D. required; pathologist or ecologist preferred; send credentials with inquiry to Chairman, Department of Biology, Texas Technological College, Lubbock, Texas. X

### CLINICAL INVESTIGATION

Large midwest ethical pharmaceutical company has opportunity for physician; prefer man 30 to 40 with some experience past internship; experience in nutrition and metabolism desirable.

### SCIENTIFIC WRITER

Young physician interested in medical writing. Work involves interpretation of laboratory and clinical data on new drugs for practicing physicians and scientific publications.

Please send complete résumé to

Technical Employment Coordinator  
**THE UPJOHN COMPANY**  
 Kalamazoo, Michigan

**SCIENCE TEACHERS, LIBRARIANS, ADMINISTRATORS** urgently needed for positions in many states and foreign lands. Monthly non-fee placement journal since 1952 gives complete job data, salaries. Members' qualifications and vacancies listed free. 1 issue, \$1.00. Yearly (12 issues) membership, \$5.00. **CRUSADE, SCI.**, Box 99, Station G, Brooklyn 22, N.Y. ew

Volume 9 May 1958 530 pages

ANNUAL REVIEW OF  
**MEDICINE**

CONTENTS :

Infectious Diseases (Bacterial)  
Fungal Infections and Chemotherapy  
Infectious Disease (Viruses)  
Diseases of the Gastrointestinal Tract  
Cardiovascular Diseases (Medical)  
Diseases of the Aorta  
Cardiovascular Diseases (Surgical)  
Diseases of the Kidney (Medical)  
Diseases of the Kidney (Surgical)  
Hemostatic Disorders: Hemophilia and the Hemophiloid Diseases  
Nutrition and Nutritional Deficiency Diseases  
Endocrinology  
Allergy and Immunology: Autoimmunity in Disease  
Neoplastic Diseases (Cancer)  
Diseases of the Nervous System  
Psychiatry  
Drug Actions Upon the Brain "Psychopharmacology"  
Clinical Evaluation of Drugs  
Diagnostic Radiology  
Toxicology of Radioactive Materials  
Diseases of the Skin  
Pediatrics  
Diseases of the Bones and Joints  
Plastic Surgery: Homotransplantation, Congenital Anomalies, Wound Healing, and Skin Storage  
Dentistry  
Laboratory Aids to Diagnosis and Therapy (Paper Chromatography and Electrophoresis)  
Laboratory Aids to Diagnosis and Therapy (Enzymes)  
Soviet Medical Research: Some Recent Advances and Future Plans

\$7.00 postpaid (U.S.A.); \$7.50 postpaid (elsewhere)

**ANNUAL REVIEWS, INC.**

Grant Avenue, Palo Alto, California

**Radiochemicals**  
**C<sup>14</sup> - LABELED**

- Large stock list available now.
- Guaranteed radiopurity - chromatographic or other data furnished.

- Custom syntheses and special orders welcomed for unlisted compounds.
- Many compounds in license-exempt packages.

- Consultation by chemists with wide C<sup>14</sup> experience.

WRITE FOR  
PRICE LIST  
1057-A



**RESEARCH SPECIALTIES CO.**

2005 HOPKINS ST.

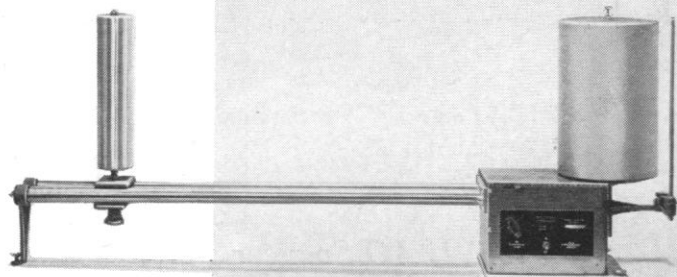
BERKELEY 7, CALIF.

Teletype: OA 259

Telephone: LA5-3833

**BIRD**

**Walton  
Kymograph**



This is our standard large size kymograph, in which we have embodied many improvements suggested by Dr. Walton. It is substantially built and may be relied upon to give long service.

The characteristics required in research or classroom demonstrations are featured in this kymograph. A combination of five gear shifts and a variable transformer Universal series motor makes available speed ranges of nine thousand to one. The approximate maximum speed is 400 cm. per minute and the minimum .045 per minute. Any speed within this range may be selected.

The drum is made of laminated bakelite tubing and is 64 cm. in circumference, 30.5 cm. high.

A support arm for mounting instrument support rods is provided. This arm pivots on and may be raised and

lowered along a column which is coaxial with the drum shaft. As many as four support arms may be mounted on this column. (One arm is normally included with each kymograph.)

Paper belt lengths up to approximately 275 cm. may be used.

**Price—The complete Kymograph as illustrated and described for 115 volts, 60 cycles A.C.**

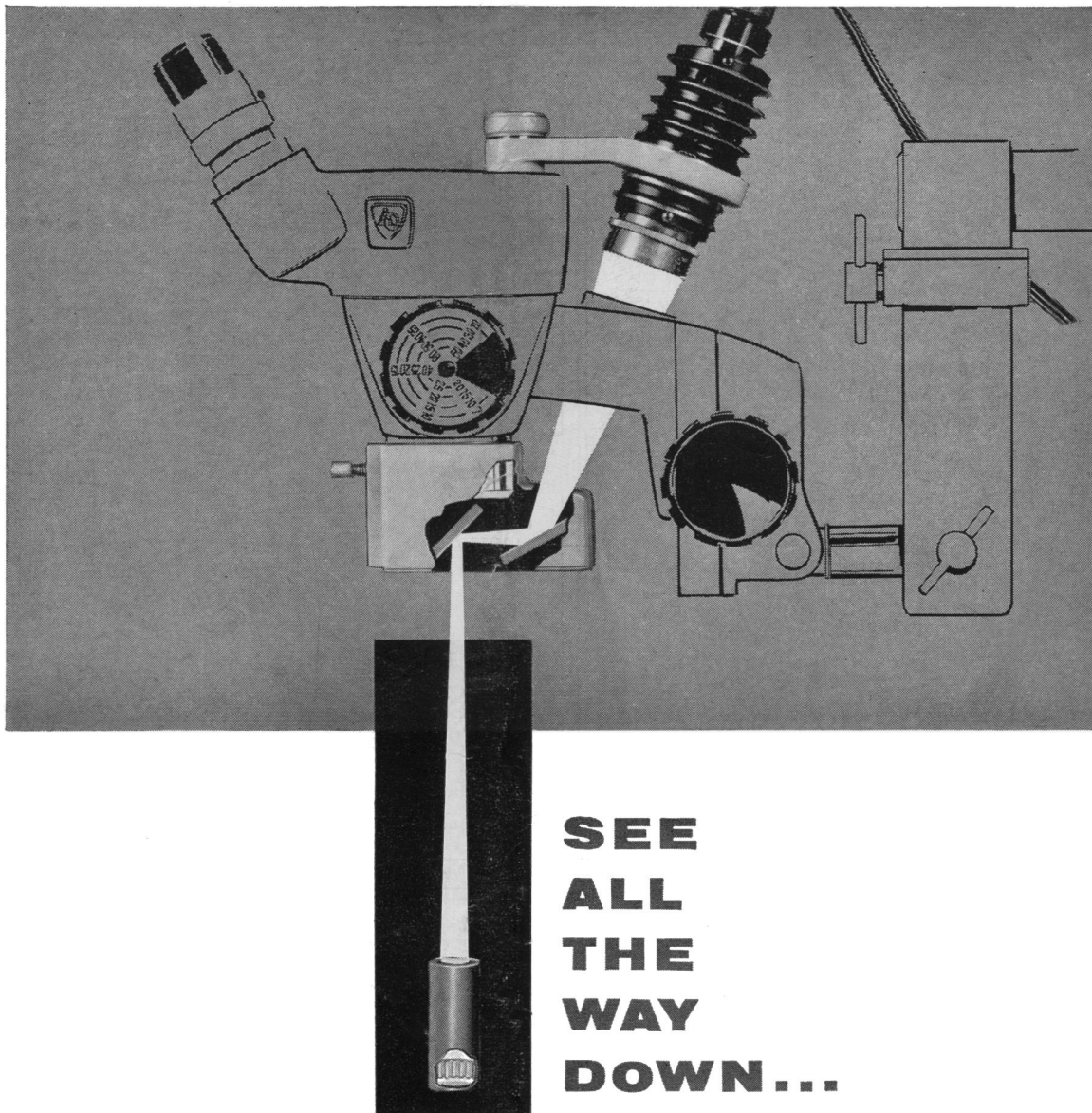
**PHIPPS & BIRD, INC.**

Manufacturers & Distributors of Scientific Equipment



6th & Byrd Streets - Richmond, Va.





***NEW, AO Spencer Vertical Illuminator allows stereoscopic magnification deep inside small diameter openings***

The new Vertical Illuminator and the AO Spencer Cycloptic Stereoscopic Microscope make a unique team that can be the answer to your problem whether it's the inspection of detail in small diameter, deep hole borings, or delicate assembly of miniaturized parts where every move is critical.

This low-cost illuminator readily attaches to the Cycloptic to provide efficient, shadowless illumination deep inside small orifices...and the Cycloptic delivers

realistic, erect, true three-dimensional magnification of the illuminated detail.

The remarkable long working distance afforded by Cycloptic (up to 7 inches when Illuminator is used with 53 and 59 Series) gives you *plus* advantages...permits ample room for large objects or inspection and assembly tools.

Add this unit to your present Cycloptic or ask about low-cost Vertical Illuminator and Cycloptic stereoscopic microscope combinations.

**American Optical  
Company**



INSTRUMENT DIVISION, BUFFALO 15, NEW YORK

Dept. E-3

Please send me FULL INFORMATION on the NEW AO SPENCER VERTICAL ILLUMINATOR AND CYCLOPTIC MICROSCOPES.

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_