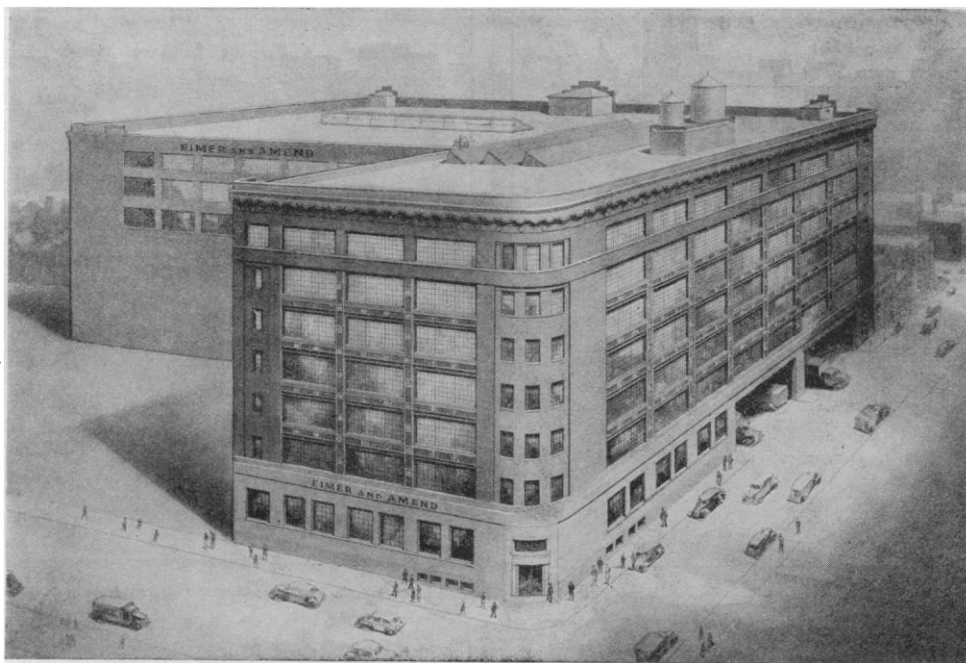


SCIENCE

NEW SERIES
VOL. 94, No. 2439

FRIDAY, SEPTEMBER 26, 1941

SUBSCRIPTION, \$6.00
SINGLE COPIES, .15



The New Plant of Eimer and Amend at Greenwich and Morton Streets in New York

EIMER AND AMEND PREPARES for Its Tenth Decade of Service to American Scientists

America's Pioneer Laboratory Supply House has moved to a new and much larger plant in New York. This expansion of facilities was made to meet the requirements of the advancement in science and the demands created by the national defense program. In this appropriate way, Eimer and Amend observes its ninetieth anniversary.

The new Eimer and Amend building at 635 Greenwich Street is a seven-story, fireproof structure containing more than four acres of floor space. It is equipped with modern offices, display rooms, glass blowing shops, engraving rooms, instrument shops, laboratories, and chemical manufacturing facilities, as well as the most up-to-date means for handling many hundreds of orders each day.

The large stocks of laboratory apparatus and the thousands of different chemicals and drugs are conveniently arranged on modern steel shelves from which orders are quickly assembled, just as they are at Fisher's Pittsburgh and Montreal plants.

The pre-eminent position of Eimer and Amend in providing laboratories with their requirements is further enhanced by its new quarters and its affiliation with the Fisher Scientific Company.

Science: published weekly by The Science Press, Lancaster, Pa.

Entered as second-class matter July 18, 1923, at the Post Office at Lancaster, Pa., under the Act of March 3, 1879.

New in Botany . . .

THE GENUS NEMOPHILA NUTT

by

Lincoln Constance

University of California Publications in Botany

Volume 19, No. 10, pp. 341-398, 13 figures in text

Paper, 75 cents

In continued demand . . .

THE MORPHOLOGY OF LANDSCAPE

by

Carl O. Sauer

University of California Publications in Geography

Volume 2, No. 2, pp. 19-54

Originally issued in 1925, reprinted line for line, 1938

Paper, 85 cents

UNIVERSITY OF CALIFORNIA
PRESS

Berkeley

Los Angeles

Address all communications to the Berkeley office

Organic Chemistry

With Applications to Pharmacy
and Medicine

By ELDIN V. LYNN, Ph.D.

Professor of Chemistry, Massachusetts

College of Pharmacy, Boston.

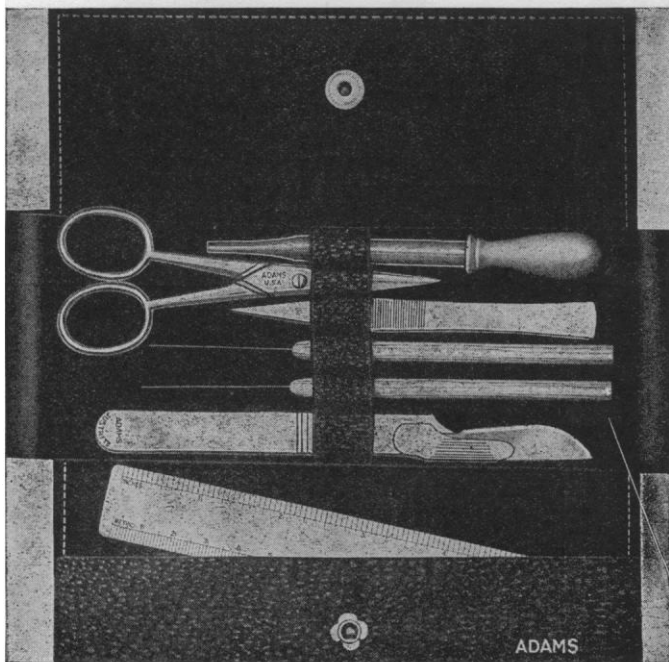
Octavo, 410 pages. Cloth, \$4.50, net.

This book reviews the basic reactions and applies them to the substances used in medicine and pharmacy. It maintains throughout the general point of view and confines itself to the reactions that are common to large groups. It teaches chemistry rather than chemicals.

LEA & FEBIGER

WASHINGTON SQUARE PHILADELPHIA, PA.

A NEW LOW PRICED DISSECTING KIT WITH A REPLACEABLE BLADE SCALPEL



A-199 Dissecting Kit, complete
as illustrated.

Each \$1.35, dozen \$13.50

B-300 Replaceable Blade Scalpel,
as illustrated in kit.

Each \$.35, dozen \$3.50

B-300X Blades for B-300 Scalpel
dozen \$1.00

Consult our Catalog No. 102S LABORATORY
INSTRUMENTS AND SUPPLIES for other Kits
and Dissecting Instruments. If you don't have a
copy, please write for one on your letterhead.

CLAY-ADAMS CO. INC.

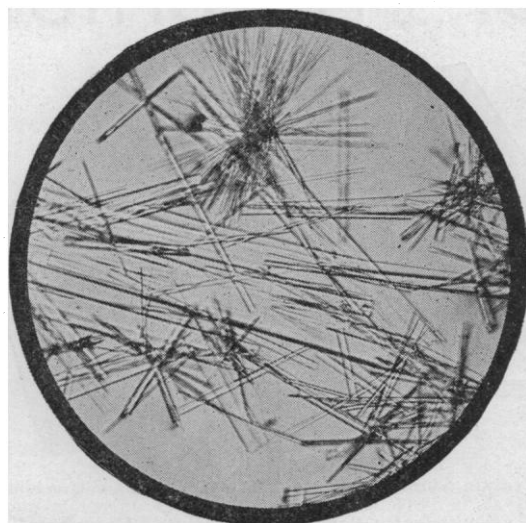
44 EAST 23rd STREET, NEW YORK, N. Y.



S. M. A. CORPORATION ANNOUNCES

CRYSTALLINE BIOTIN

METHYL ESTER



Crystalline biotin methyl ester, isolated and purified in the Research Laboratories of S.M.A. Corporation, is now ready for distribution in limited quantities. This previously unavailable factor of the vitamin B complex is offered as a solution quantitatively prepared from crystalline biotin methyl ester and is therefore suitable for standardization procedures. It is supplied in 1 cc. ampuls each containing 25 micrograms.

Solution Biotin Methyl Ester—25 Micrograms in 1 cc.

1 Ampul	\$ 3.50
3 Ampuls	10.00

Because of the widespread interest in biotin and the limited supply of crystalline material immediately available each order will be restricted to 3 ampuls. Shipments will be made in the order in which requests are received.

Research Laboratories

S. M. A. CORPORATION
CHAGRIN FALLS, OHIO



THE "LUMETRON" PHOTOELECTRIC COLORIMETER AND ABRIDGED SPECTROPHOTOMETER



For quantitative analysis involving measurement of Transmission, Ultraviolet Absorption, Fluorescence, Turbidity, Trichromatic Analysis, and Reflection Measurements on solids and powders. The Lumetron Photoelectric Colorimeter is an unusually flexible instrument. Because of the rigid alignment of the entire optical structure, forced draft ventilation, special zero-resistance circuit, and the other features presented below, this instrument is ideally suited to research use.

Sample Holders up to 6" long. Great variety of rectangular and cylindrical holders of fused glass, microcells, micro test tubes, and test tube adapters are available.

14 Monochromatic Filters (average spectral width 30 millimicrons) available for abridged spectrophotometry.

Operated from power line, fully balanced for line voltage variations, without batteries or constant voltage transformer.

Reproducible, linear readings, obtained by operating photocells at low light values in a zero-resistance current bridge (Brice Circuit).

Lamp intensity adjustment to compensate for spectral changes of lamp.

19450—Photoelectric Colorimeter-Lumetron, Model 402E. Complete with galvanometer, photocells, and light bulb but without sample holders or light filters. For operation on 110–120 volts, 60 cycles A.C. **250.00**

Tri-Color Filters available to duplicate visual color observation under daylight conditions.

Mercury Vapor Lamp, easily and rapidly exchangeable for incandescent lamp. All-quartz high-pressure type. All-quartz optical system available for fluorescence and ultraviolet absorption tests.

Twin-Cell Fluorescence Pick-Up and G E multiple reflection galvanometer for measuring of faint fluorescence as for instance in determining low Vitamin B1 concentrations. Also for turbidity tests by Tyndall beam measurement.

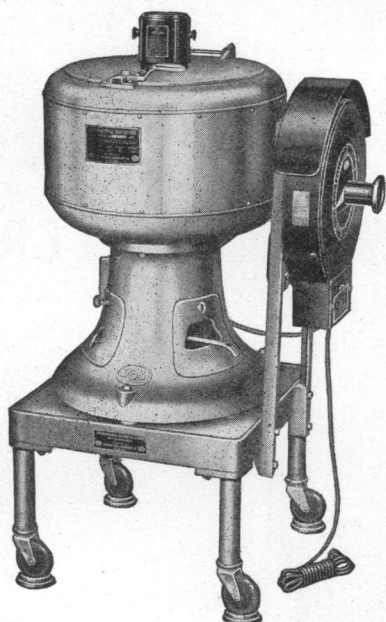
Reflection Adapters available for color tests on solids and powders.

*Write for detailed information and recommendation
of suitable equipment to particular applications.*

WILL CORPORATION, ROCHESTER, NEW YORK
Offices and Warehouses

BUFFALO APPARATUS CORP., Buffalo, N. Y. • WILL CORPORATION, 596 Broadway, New York City

LABORATORY APPARATUS AND CHEMICALS



*The Popular Centrifuge
of Intermediate Size—
with a twenty year record.*

The *Size 1, Type SB Centrifuge* is a most popular model, of intermediate size, because it has ample capacity and speeds for routine hospital laboratory work. Many have been in constant service for twenty years with the *original International features* such as the brush release and brake mechanism, protective starting and low voltage release on rheostat, the flexibly mounted universal motor and the indicating tachometer.

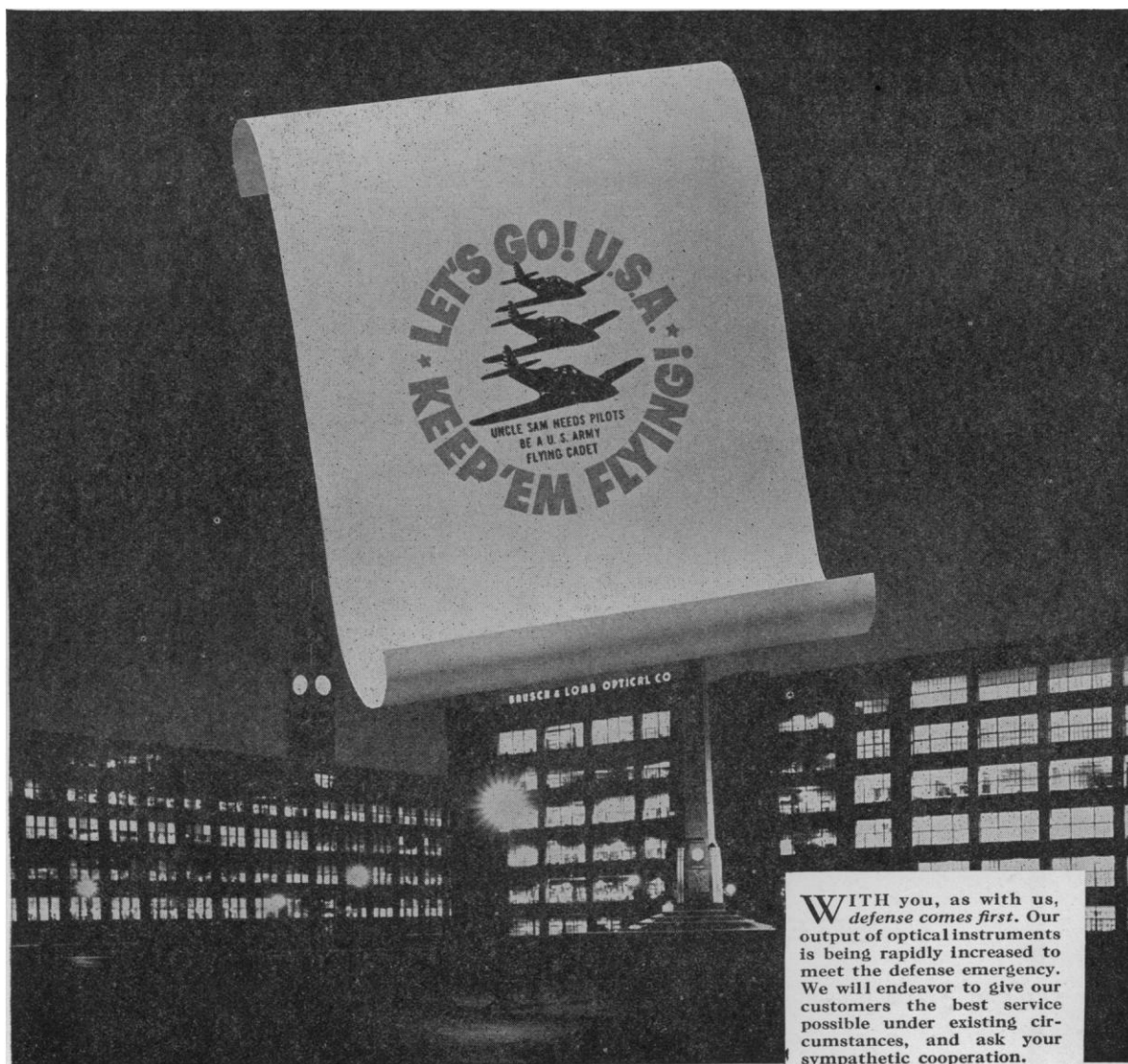
**THE
INTERNATIONAL
SIZE 1, TYPE SB CENTRIFUGE**

Features :

- Speeds to 5,000 r.p.m., depending upon equipment used.
- Capacity to 1 litre.
- Adaptable to wide variety of accessory equipment.
- Practically vibrationless, with motor cushioned in rubber.
- Brush release and hand brake.
- Indicating Tachometer.
- 50 step speed control.
- Fully enclosed motor—for added safety.
- Portable stand of rugged construction.

Send for
Bulletin C1

INTERNATIONAL EQUIPMENT CO.
352 WESTERN AVE. BOSTON, MASS.
Makers of Fine Centrifuges



WITH you, as with us, defense comes first. Our output of optical instruments is being rapidly increased to meet the defense emergency. We will endeavor to give our customers the best service possible under existing circumstances, and ask your sympathetic cooperation.

THE challenge of the War Department finds one answer in the words of Edward Bausch when he says, "My associates and myself have obligated this company to a program that eclipses in magnitude and speed all previous efforts."

This pledge is underlined and italicized three times every twenty-four hours by the long lines of workers in each change of shift. Every resource and facility gained in filling the diverse optical needs of education, research and industry is being concentrated in maintaining an unbroken flow of optical instruments to America's front lines of defense and to America's defense industries.

Many are the Bausch & Lomb products that help to "keep 'em flying." There are

bubble octants for aerial navigation; photo lenses for mapping and reconnaissance, height finders, searchlight mirrors and flank-spotting scopes for anti-aircraft defense; binoculars for spotters; Ray-Ban Glasses for fliers.

The accepted optical aids to industry developed by Bausch & Lomb—the Contour Measuring Projector, the Metallographic Equipment, the B & L Littrow Spectrograph—are now in the first line of production, doing important work in keeping them flying.

BAUSCH & LOMB
OPTICAL CO. • ROCHESTER, NEW YORK
ESTABLISHED 1853

AN AMERICAN SCIENTIFIC INSTITUTION PRODUCING OPTICAL GLASS AND INSTRUMENTS FOR NATIONAL DEFENSE, EDUCATION, RESEARCH, INDUSTRY AND EYESIGHT CORRECTION

SCIENCE

VOL. 94.

FRIDAY, SEPTEMBER 26, 1941

No. 2439

<i>The Pacific Ocean</i> : DR. H. U. SVERDRUP	287	<i>bodies</i> : DR. WILLIAM MCD. HAMMON and OTHERS. <i>A Syndrome in Macacus rhesus after Inoculation of</i> <i>Stool from Carriers of Poliomyelitis Virus</i> : DR. GEORGE Y. MCCLURE. <i>Resynthesis of Biotin from a</i> <i>Degradation Product</i> : DONALD B. MELVILLE, KLAUS HOFMANN and PROFESSOR VINCENT DU VIGNEAUD	305
<i>Obituary</i> :		<i>Scientific Apparatus and Laboratory Methods</i> :	
<i>Edward Kremers</i> : DR. GEORGE URDANG. <i>Recent</i>		<i>An Inexpensive Square-wave Generator</i> : CRAIG W.	
<i>Deaths</i>	293	GOODWIN. <i>An Adjustable Resistor for Flowmeters</i> :	
<i>Scientific Events</i> :		ERNEST L. GOODEN	309
<i>Chemistry in College-Grade Defense Training; The</i> <i>Submicroscopical Research Center at Stanford Uni-</i> <i>versity; A New Biological Laboratory in Alaska;</i> <i>The Use for Defense Purposes of the Building in</i> <i>Washington of the National Academy of Sciences;</i> <i>The British Association</i>	294	<i>Science News</i>	8
<i>Scientific Notes and News</i>	296		
<i>Discussion</i> :			
<i>Current List of Medical Literature</i> : JOE HARE. <i>Young Sailfish</i> : DR. WILLIAM BEEBE. <i>A Sub-</i> <i>merged Migration Route</i> : PROFESSOR PAUL B. SEARS. <i>The Relationship of the American Pharma-</i> <i>ceutical Association to the United States Pharma-</i> <i>copoeia</i> : DR. GEO. D. BEAL	299		
<i>Quotations</i> :			
<i>The Mathematical Tool</i>	302		
<i>Scientific Books</i> :			
<i>Physics and Philosophy</i> : DR. W. F. G. SWANN. <i>A</i> <i>Background to Museum Exhibition</i> : DR. GEORGE C. VAILLANT	303		
<i>Reports</i> :			
<i>The Proposed Society for Freedom in Science</i>	304		
<i>Special Articles</i> :			
<i>Western Equine and St. Louis Encephalitis Anti-</i>			

SCIENCE: A Weekly Journal devoted to the Advancement of Science, edited by J. McKEEN CATTELL and published every Friday by

THE SCIENCE PRESS

Lancaster, Pa.

Garrison, N. Y.

New York City: Grand Central Terminal

Annual Subscription, \$6.00

Single Copies, 15 Cts.

SCIENCE is the official organ of the American Association for the Advancement of Science. Information regarding membership in the Association may be secured from the office of the permanent secretary in the Smithsonian Institution Building, Washington, D. C.

THE PACIFIC OCEAN¹

By DR. H. U. SVERDRUP

SCRIPPS INSTITUTION OF OCEANOGRAPHY, LA JOLLA

THE Pacific Ocean can be discussed from a number of different points of view. One could deal with the history of its discovery and exploration from the time of Magellan's long and perilous journey up to the present day when clippers of the air cross and recross the ocean in a few days, or one could discuss its importance as a highway of the sea carrying trade between large surrounding countries, or one might consider it as determining the routes for the migration of man and the spreading of culture from island group to island group and from continent to continent. I shall not attempt to discuss the Pacific Ocean from any of these points of view, but shall, instead, deal with the water masses themselves and with the

systems of prevailing currents, and shall indicate how the ocean influences the climate and the weather of the surrounding land and how the productivity of the sea, which is becoming increasingly important to the economy of man, varies from one region to another because of the character of the currents.

As a starting point let us examine the distribution of surface temperature over the Pacific Ocean in the month of August. The striking features are, in the first place, the vast extent of the tropical areas in which the surface temperature is very high, above 24° C. (75° F.), and, in the second place, the tongues of low temperature which extend towards the Equator along the western boundaries of the ocean, that is, along the coasts of North and South America. Due to the intrusion towards the Equator of these cold

¹ Contributions from the Scripps Institution of Oceanography, New Series, No. 147.

ing manometer arm. The resistor is often represented diagrammatically as a short capillary, but in practice it takes on a variety of forms, for a simple short section of capillary glass tubing in the readily available bore sizes often fails to provide enough resistance.

The most frequently adopted way of obtaining high resistance, no doubt, is to use a long capillary, sometimes an unwieldy bundle of tubes several meters in total length. A common alternative is to decrease the diameter for part of the path by reworking the glass to form a constriction; a compact element results, but the danger of clogging is increased. A resistor that is both compact and nonlogging may be formed by packing small-bore glass tubing with fine sand, preferably narrowly fractionated as to size—say, 200–325 mesh—and washed free of dust. A resistor recom-

mended by Bruun¹ comprises a short capillary tube containing an exchangeable wire, different magnitudes of resistance being obtainable by use of different sizes of wire in the same tube.

All these types of resistors have one feature in common that is sometimes a serious drawback. When for purposes of standardization it is desirable to have precisely a given amount of resistance, accurate construction is at best a tedious job, and in some cases practically impossible. This fault is obviated in the device described below.

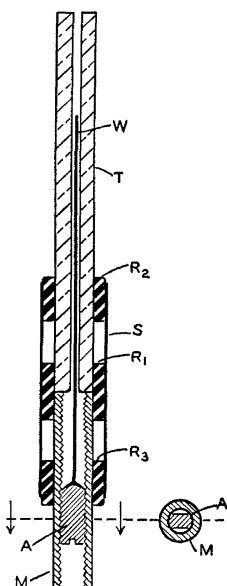


FIG. 1. Resistor in longitudinal section, with cross section of threaded parts.

In this resistor (Fig. 1), as in that of Bruun, resistance is effected by a short capillary containing a corrosion-resistant wire. Unlike Bruun's device, however, the wire (W) extends through somewhat less than the whole length of the glass capillary tube (T), the length of the inserted portion being determined roughly in advance by calculation and subsequently corrected experimentally to a close approximation. The protruding end of the wire is soldered to one end of an adjusting screw (A), which fits within an inside-threaded metal tube (M). The screw is grooved on the other end for operation with a screw driver, and is cut down flat throughout its length on two opposite sides to allow free passage of air through the metal tube. The glass and metal tubes are ap-

proximately the same in outside diameter, and are connected closely by one (R₁) of three similar short sections of heavy-wall rubber tubing. The other two sections (R₂, R₃) are slipped around the glass tube and the metal tube, respectively, some distance from the connecting section (R₁). A sheath (S) of springy sheet metal nearly surrounds the three rubber-tube sections, which it grips firmly by reason of its tension, and thereby serves as a splint to hold the assembly rigid. A ready-made article that lends itself admirably to use as the sheath is the spring element of a well-known type of paper clip.

The resistor may be installed in the flowmeter by the use of one or two connections of rubber tubing, depending on whether or not one end is to be left open to the atmosphere. When the assembly is otherwise complete, the wire, having been cut originally somewhat too long, is clipped down to give as nearly as possible the correct resistance when the adjusting screw is about midway between the ends of the threaded tube. Fine adjustment can then be made by turning the screw.

It should be pointed out that in a capillary containing a wire, where both are perfectly straight, the resistance will depend on how nearly centered they are with respect to each other. In practice, however, if the wire is nearly as large as the bore, the tendency of the former to kink will prevent any troublesome variation of the resistor as a whole.

This device has a wide field of usefulness, has a material cost of only a few cents, and is easily constructed without special tools.

ERNEST L. GOODEN

BUREAU OF ENTOMOLOGY AND
PLANT QUARANTINE,
U. S. DEPARTMENT OF AGRICULTURE

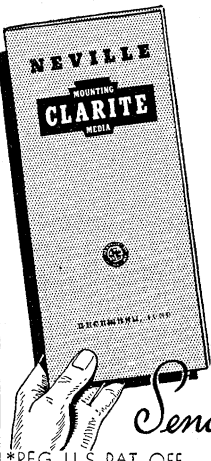
BOOKS RECEIVED

- BAITSELL, GEORGE A. *Manual of Biology*. Sixth edition. Pp. ix + 449. 12 plates. Macmillan. \$2.75.
- Bicentennial Conference of the University of Pennsylvania: BOWEN, NORMAN L., JOSEPH A. CUSHMAN and ROY E. DICKERSON. *Shiftings of Sea Floors and Coast Lines*. Pp. 30. NOYES, W. ALBERT, JR., HUGH S. TAYLOR and WALTER A. JACOBS. *Chemical Kinetics and Natural Products*. Pp. 41. MYERS, CHARLES S., FRANK N. FREEMAN and MORRIS S. VITELES. *Modern Psychology*. Pp. 48. University of Pennsylvania Press, Philadelphia. Each, \$0.50.
- BIRKHOFF, GARRETT and SAUNDERS MACLANE. *A Survey of Modern Algebra*. Pp. xi + 448. Macmillan. \$3.75.
- IDDINS, MAE. *Workbook for Physical Education*. Pp. 144. Illustrated. Mosby. \$1.50.
- KELLY, HARRY C. *A Textbook in Electricity and Magnetism*. Pp. vii + 356. Illustrated. Wiley. \$3.75.
- LINDSAY, ROBERT B. *An Introduction to Physical Statistics*. Pp. ix + 306. Illustrated. Wiley. \$3.75.
- RUCH, THEODORE C. *Bibliographia primatologica; A Classified Bibliography of Primates Other Than Man. Part I.* (Publication No. 4, Historical Library, Yale Medical Library.) Pp. xxvii + 241. Charles C Thomas. \$8.50.

¹ J. H. Bruun, *Ind. Eng. Chem., Anal. Ed.*, 11, 655 (1939).

**MOUNTING
CLARITE***
MEDIA

**For Covering Histological
Sections on Slides**



Clarite and Clarite "X" Resins are available in lumps or ready-to-use solutions.

Inert, high-melting, water-white; many advantages over Canada balsam and gum damar. Clarites have proper refractive indices and adhesion to glass, and will neither become acid nor discolor with age. Clarites are pure, uniform, perfectly transparent. Will not cause stains to fade with age because they are absolutely neutral and remain so.

Send for booklet "Neville Clarite Mounting Media"

*REG. U.S. PAT. OFF.

THE NEVILLE COMPANY
PITTSBURGH • PA.

CAROLINA CULTURES

A DEPENDABLE CULTURE SERVICE

- L 1 Giant Amoeba proteus (standard for study).
 Class of 25 (container and postage) \$2.00
 Class of 50 (container and postage) 3.50
 Class of 75 (container and postage) 4.75
 Class of 100 (container and postage) 6.00
 Same price as above: *Paramecium caudatum*, *Stentor*, *Vorticella*, *Peranema*, *Volvox*, *Mixed Protozoa*. *Anguillula* or "Vinegar eels."
- L 2 *Paramecium multimicronucleatum* (giant form of *Paramecia*, excellent for laboratory study).
 Class of 25 (container and postage) \$1.50
 Class of 50 (container and postage) 2.50
 Class of 75 (container and postage) 3.25
 Class of 100 (container and postage) 4.00
 Same price as L 2: *Euglena*, *Arcella*, *Chilomonas*, *Daphnia*, *Copepods*.
- L 60 *Hydra*, Green or Brown (state preference).
 Class of 25 (container and postage) \$1.50
 Class of 50 (container and postage) 2.50
 Class of 75 (container and postage) 3.25
 Class of 100 (container and postage) 4.00
 Same price as *Hydra*: *Spirogyra*, *Nitella*, *Elodea*, *Cabomba*, *Myriophyllum*.
- L 220 *Planaria maculata* or *dorotocephala* (the former or light colored species is generally preferred).
 Class of 25 (container and postage) \$1.75
 Class of 50 (container and postage) 3.00
 Class of 75 (container and postage) 4.00
 Class of 100 (container and postage) 5.00

For *Drosophila* cultures. *Tenebrio* or "Meal-Worms," Aquarium Sets or Assortments, living Frogs, Turtles, Rats, Mice, etc., see our catalogue number 15.
 We have a complete line of Preserved Specimens, Microscopic Slides, Dissecting Instruments, etc. Our publications—*Carolina Tips* and Catalogue number 15 will be sent free upon application.

CAROLINA BIOLOGICAL SUPPLY CO.

ELON COLLEGE, NORTH CAROLINA

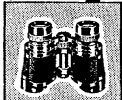
SPRAGUE - DAWLEY, INC.

Pioneers in development of the standard laboratory rat

Madison, Wisconsin

GEOLOGY—Ph.D. with successful teaching, research and field experience desires connection including advanced teaching and research. Employed. Address "S.W.," care of *Science*, 3941 Grand Central Terminal, New York, N. Y.

Bargains in New and Used Glasses! All makes,



Sizes & powers of nature, sport & hunting glasses, \$6. upward. Telescopes, spotting & riflescopes. Microscopes, magnifiers & compasses, \$1. upward. Repair work & goods guaranteed.

J. ALDEN LORING, OWEGO, N.Y. Catalog free, Box B.

LaMotte Combination Soil Testing Outfit

One of the most popular outfits, contains tests for pH, potash, phosphorus, and nitrates, all assembled in one wooden carrying case with complete apparatus, reagents and instructions; price \$35.00 f.o.b. Baltimore, Md. Other combinations can be supplied varying from three tests up to eight. Prices on request.

LaMotte Chemical Products Co.

Dept. "H"

Towson, Baltimore, Md.