you know your tissues will spread evenly

The water temperature will be just right for smooth, even spreading: never too hot or too cold. No melting paraffin to distort tissues; no folds or wrinkles. No bubbles due to frequent water change . . . temperature stays constant day in, day out. Bulletin 6320 gives particulars: send for it.

TECHNICON COMPANY, 215 E. 149th St., New York 51, N. Y.

---

... it's a Technicon constant temperature water bath
We will shortly publish this important new text that bids fair to change the entire picture of endocrinological study. Until quite recently, endocrinology has been looked upon as a subject important mainly to the medical man. However, when endocrinology is regarded as the science of chemical coordination of the individual—as in Dr. Turner's text—it assumes a basic position in biology, and becomes a most appropriate subject for study by undergraduates in Colleges of Liberal Arts.

This biological approach to general endocrinology has been developed by Dr. Turner with outstanding success. The subject is studied from an experimental rather than from a clinical point of view. Attention is directed to the operation of coordinatory mechanisms in plants, invertebrates and vertebrates. Whenever possible, the human being has been chosen to illustrate the operation of biologic principles. The individual glands are covered in great detail. For each there is a full discussion of gross, microscopic, developmental and comparative anatomy; physiology; biochemistry; and dysfunctions.

The beautiful collection of illustrations drawn for this book, plus the numerous charts and bibliographies will help greatly in teaching the subject. In addition to its use as a general endocrinology text, the book will prove valuable to all who are doing work in the biological sciences.

By C. Donnell Turner, Ph.D., Associate Professor of Zoology, Northwestern University. About 620 pages, 6" x 9", with 164 illustrations.

W. B. SAUNDERS COMPANY

West Washington Square  Philadelphia 5
CONTENTS

The Current Transition in the Conception of Science: D. Ewen Cameron 553

Obituary
Burton Edward Livingston: Charles A. Shull 558

Association Affairs
Centennial Celebration Notes ........................................ 561

News and Notes .......................................................... 562

Comments and Communications ........................................ 566

Technical Papers
Pulmonary Edema in Leucemic Mice Following Treatment With Urethane: William W. Winchester and George M. Higgins 568

Use of Radioactive Diiodofluorescein in the Diagnosis and Localization of Brain Tumors: George E. Moore 569

Similarity to Heparin of the Clotting Inhibitor in Acute Leucemia and the Significance of Hyperheparinemia in Estradiene Cholinergic States: Robert D. Barnard 571

Use of a Plastic Material to Increase the Action of the Sodium Salt of 2,4-D: C. L. Hamner and Kiang Chi-Kien 572

Application of Chromatography to Segregation Studies of the Agent of Chicken Tumor I (Rous Sarcoma Virus): Vernon T. Riley 573

In the Laboratory
An Automatic Proportioning Apparatus for Experimental Study of the Effects of Chemical Solutions on Aquatic Animals: Albert Collier and Sammy M. Ray 576

The Induction of Cytogenetic Variations by Ultrasonic Waves: R. H. Wallace, R. J. Bushnell, and Earl H. Newcomer 577

A Rapid Method of Single Cell Isolation: Richard D. Northcraft 578

Book Reviews
Surface chemistry for industrial research: J. J. Bikeriet.
Reviewed by E. Roger Washburn 579

Microwave mixers: Robert V. Pound.
Reviewed by Gustave Shapiro 579

Scientific Book Register .................................................. 580

(Cover photo by courtesy of Yale University News Bureau.)

Science, a weekly journal, is published each Friday by the American Association for the Advancement of Science at The Business Press, Incorporated, N. Queen St. and McGovern Ave., Lancaster, Pa. Founded in 1880, it has been since 1900 the official publication of the AAAS. Editorial and Advertising Offices, 1515 Massachusetts Avenue, N.W., Washington 5, D.C. Telephone, Executive 8000 or 8001. Cable address, SCIAMAG, Washington, D.C. Entered as second-class matter at the Post Office at Lancaster, Pa., January 13, 1948, under Act of March 3, 1897. Acceptance for mailing at the special rate postage provided for in the Act of February 28, 1923, embodied in paragraph 4, Sec. 508, P. L. and R., authorized January 13, 1948.

Articles offered for publication should be sent to the Editor. The AAAS assumes no responsibility for the opinions expressed by contributors. Membership correspondence for the AAAS should be sent to the Administrative Secretary.

Annual subscription, $7.50; single copies, $1.25; foreign postage (outside the Pan-American Union), $1.00 extra; Canadian postage, $5.00 extra. Remittances and orders for subscriptions and single copies should be sent to the Circulation Department, AAAS, North Queen Street and McGovern Avenue, Lancaster, Pennsylvania, and 1515 Massachusetts Avenue, N.W., Washington 5, D.C. Claims for missing numbers will not be allowed if received more than 60 days from date of issue. No claims allowed from subscribers in Central Europe, Asia, or the Pacific Islands other than Hawaii or because of failure to notify the Circulation Department of a change of address or because copy is missing from the files.

Change of address. Four weeks notice is required for change of address. This should be sent to Science, 1515 Massachusetts Avenue, N.W., Washington 5, D.C. When ordering a change, please furnish an address stencil label from a recent issue. Address changes can be made only if the old as well as the new address is supplied.

The American Association for the Advancement of Science also publishes The Scientific Monthly. Subscription rates on request.
A new physics text

HECTOR, LEIN and SCOUTEN

Physics for Arts and Sciences

This is a new beginners text on the physics of today. Modern, concise explanations are given from the start, making it easy for the student to think through each problem by concrete reasoning rather than by an abstract mathematical approach.

- The style is terse and lucid, planned to attract and hold the interest of beginning students.
- Heat and Sound are presented from a mechanical point of view.
- Magnetism and Light are introduced primarily as electrical phenomena.
- An overview is presented at the beginning of each chapter.
- Problems are presented in graded groups.
- At the end of chapters the principal ideas developed are listed and the central thought summarizing the chapter is stressed.
- Suggestions for experimental work to be carried out in the home and in the laboratory are included.
- A large number of color illustrations feature the text. These sharply focus attention on pertinent phases of experiments and significant parts of apparatus.
- The text has been thoroughly tested with various types of students with excellent results.

The Authors: L. Grant Hector, Ph.D., Sonotone Corporation of America
Herbert S. Lein, Ph.D., University of Buffalo
Clifford E. Scouten, Ph.D., University of Buffalo

Ready for Summer and Fall Classes

THE BLAKISTON COMPANY
PHILADELPHIA 5, PA.
Cyclotron Specialties Impulse Register was originally designed to meet the exacting requirements of radioactivity research workers. Through outstanding performance, this counter has become a standby in many fields of scientific work throughout the entire world.

The Cyclotron Specialties Register is unique in its ability to operate at exceptionally high speeds with complete accuracy and without adjustment or maintenance. It is unexcelled for high speed impulse recording and mechanical operations requiring counting in precise quantities.

The operation of the Cyclotron Specialties Impulse Register is entirely automatic. Originally designed for our Geiger-Müller Counter Sets, it has found numerous other applications... both industrial and research... including:

- **PRECISE CONTROL OF QUANTITIES** (Packaging, Sorting, etc.)
- **CUTTING** of MATERIALS, FABRICS, etc., to EXACT LENGTHS
- **CONTROLLING VARIOUS MECHANICAL OPERATIONS**
- **CONTROLLING FUNCTIONS** such as TIME, DIMENSIONS, VELOCITY, etc.

Inquiries for special types and modifications including higher speeds, electrical reset, flush panel mounting and higher totalization will now receive prompt attention.

**SPECIFICATIONS**

of Cyclotron Specialties Impulse Register No. 401-A

- **ACCRUATELY REGISTERS UP TO**
- **60 IMPULSES PER SECOND**

Main, easily-read sweep dial reads 0 to 100 directly.
Sweep dial plus auxiliaries read 0 to 9,999 impulses without extra equipment.
4000 ohm D. C. resistance.
Operates on as low as 100 milliwatt.
Small, compact, light weight. Attractive plastic case with non-removable top binding posts.
Durable, rugged construction to withstand avoidable accidents.
Dimensions: 3" x 4"  Weight: 2 lbs.

Immediate Delivery in Reasonable Quantities

Cyclotron Specialties Company

Moraga, California
# HOTEL RESERVATIONS

**AAAS CENTENNIAL CELEBRATION**

September, 13-17, 1948

<table>
<thead>
<tr>
<th>HOTEL</th>
<th>LOCATION</th>
<th>SINGLE</th>
<th>DOUBLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMBASSADOR</td>
<td>14th and K Sts, NW</td>
<td>$3.50-6.00</td>
<td>$6.00-8.00</td>
</tr>
<tr>
<td>ANNAPOLIS</td>
<td>12th and H Sts, NW</td>
<td>3.50-5.00</td>
<td>5.00-8.00</td>
</tr>
<tr>
<td>BLACKSTONE</td>
<td>1016 17th St, NW</td>
<td>6.00-</td>
<td></td>
</tr>
<tr>
<td>BURLINGTON</td>
<td>1120 Vermont Ave, NW</td>
<td>3.50-5.00</td>
<td>5.50-8.00</td>
</tr>
<tr>
<td>CARLTON</td>
<td>16th and K Sts, NW</td>
<td>9.00-11.00</td>
<td></td>
</tr>
<tr>
<td>CARROLL ARMS</td>
<td>1st and C Sts, NE</td>
<td>4.00-5.00</td>
<td>6.00-8.00</td>
</tr>
<tr>
<td>COMMODERE</td>
<td>North Capitol at F</td>
<td>3.50-4.50</td>
<td>5.00-7.00</td>
</tr>
<tr>
<td>CONTINENTAL</td>
<td>North Capitol at E</td>
<td>4.00-6.00</td>
<td>6.00-8.00</td>
</tr>
<tr>
<td>DODGE</td>
<td>North Capitol at E</td>
<td>4.00-6.00</td>
<td>6.00-9.00</td>
</tr>
<tr>
<td>FAIRFAX</td>
<td>21st and Mass. Ave, NW</td>
<td>5.00-</td>
<td>7.00-8.00</td>
</tr>
<tr>
<td>HAMILTON</td>
<td>14th and K Sts, NW</td>
<td>3.50-5.50</td>
<td>6.50-9.00</td>
</tr>
<tr>
<td>HARRINGTON</td>
<td>11th and E Sts, NW</td>
<td>3.00-4.00</td>
<td>5.00-8.50</td>
</tr>
<tr>
<td>HAY-ADAMS</td>
<td>16th and H Sts, NW</td>
<td>4.00-6.50</td>
<td>6.00-9.00</td>
</tr>
<tr>
<td>LAFAYETTE</td>
<td>16th and Eye Sts, NW</td>
<td>4.00-6.00</td>
<td>6.00-9.00</td>
</tr>
<tr>
<td>MARTINIQUE</td>
<td>16th and M Sts, NW</td>
<td>3.50-6.00</td>
<td>5.00-8.00</td>
</tr>
<tr>
<td>MAYFLOWER</td>
<td>Connecticut Avenue</td>
<td>5.50-10.00</td>
<td>8.50-15.00</td>
</tr>
<tr>
<td>NATIONAL</td>
<td>1808 Eye St, NW</td>
<td>2.50-3.50</td>
<td>4.50-5.50</td>
</tr>
<tr>
<td>NEW COLONIAL</td>
<td>15th and M Sts, NW</td>
<td>3.50-5.00</td>
<td>6.50-9.00</td>
</tr>
<tr>
<td>PLAZA</td>
<td>331 1st St, NE</td>
<td>3.50-4.50</td>
<td>5.50-8.00</td>
</tr>
<tr>
<td>RALEIGH</td>
<td>12th and Penn. Ave, NW</td>
<td>4.50-6.50</td>
<td>6.50-11.00</td>
</tr>
<tr>
<td>ROGER SMITH</td>
<td>18th and Penn. Ave, NW</td>
<td>3.50-6.00</td>
<td>5.50-8.00</td>
</tr>
<tr>
<td>SHERATON</td>
<td>15th and L Sts, NW</td>
<td>6.50-9.00</td>
<td></td>
</tr>
<tr>
<td>SHOREHAM</td>
<td>2500 Calvert St, NW</td>
<td>6.00-7.00</td>
<td>8.00-10.00</td>
</tr>
<tr>
<td>STATLER</td>
<td>16th and K Sts, NW</td>
<td>4.50-10.50</td>
<td>8.00-13.00</td>
</tr>
<tr>
<td>TWENTY-FOUR HUNDRED</td>
<td>2400 16th St, NW</td>
<td>4.00-5.50</td>
<td>8.00-9.00</td>
</tr>
<tr>
<td>WARDMAN PARK</td>
<td>2660 Woodley Road, NW</td>
<td>4.50-6.00</td>
<td>7.00-9.00</td>
</tr>
<tr>
<td>WASHINGTON</td>
<td>15th and Penn. Ave, NW</td>
<td>4.50-8.50</td>
<td>8.00-13.00</td>
</tr>
<tr>
<td>WILLARD</td>
<td>14th and Penn. Ave, NW</td>
<td>4.50-8.00</td>
<td>6.00-11.00</td>
</tr>
</tbody>
</table>

Mail this HOTEL RESERVATION BLANK now to the Housing Bureau

(please not send to hotel)

**AAAS Housing Bureau**
204 Evening Star Building
Washington 4, D. C.

Please reserve the following accommodations for the AAAS Centennial Meeting. Attached find list giving name of each guest in my party.

**Type Accommodation Desired**

- Single room
- Double room

**Hotel**

- First choice
- Second choice
- Third choice

**Date of arrival**
**Departure date**
(These must be indicated)

**Signed**

**Street Address**
**City**
**Zone**
**State**

Rooms will be assigned and confirmed in order of receipt of reservation.
The new standard basic line of apparatus items with PYREX brand ball and socket joints brings new flexibility and speed to apparatus assembly.

By eliminating the necessity of aligning perfectly every apparatus assembly, much time is saved with no loss in accuracy. Ball joints can't freeze, save time in disassembly. Since each piece is individually tested before shipment, these ball and socket joints assure superior operation under vacuum. So rigid are Corning's manufacturing and testing standards that you are assured complete interchangeability.

Your laboratory can enjoy the advantages of ball joint apparatus built for service, economy. The PYREX trademark on every item assures you of manufacture in Corning shops by our skilled craftsmen.
recognize
these organisms
at a glance

Leitz
MICROSCOPE

by the makers of LEICA Cameras

Differential recognition of microorganisms is made possible by
Leitz precision lenses. Leitz microscopes give observers a flat field
and maximum definition.

Present supply limited. Wire or write today for quotations and
descriptive literature.

E. LEITZ, Inc.  DEPT. 8
304 HUDSON STREET  NEW YORK 13, N. Y.
Microscopes, Colorimeters and Other Scientific Instruments
See the amazing difference on the screen . . .

**SHARP, BRILLIANT SCREEN IMAGES**

with **BAUSCH & LOMB DUAL PURPOSE LRM BALOPTICON**

The Bausch & Lomb LRM Balopticon Gives You ALL THESE FEATURES

- **Dual Purpose Projector.** Shows both conventional and student-made slides and opaque objects, including printed illustrations and text, photographs and geological or botanical specimens.

- **Large, Sharp, Brilliant Screen Images.** Possible because of unusual amount of light projected by two fine quality optical systems.

- **No Distracting Change In Image Brightness.** Balanced illumination permits switching from slide to opaque projection without change in screen brilliance. Eliminates eyestrain, increases audience appreciation.

- **Built-in Blower Cooling System.** Slides and opaque materials are thus protected from heat damage.

Look for these features before you buy. See for yourself with a visual demonstration how B&L Balopticons answer every still projection need for small auditoriums, schoolrooms, meetings, etc. No obligation, of course. Use the handy coupon to request free demonstration and literature.

*Trade Mark Registered U. S. Pat. Off.*

---

**BAUSCH & LOMB OPTICAL COMPANY**

ROCHESTER 2, N.Y.

---

**WRITE FOR FREE DEMONSTRATION**

---

**BAUSCH & LOMB OPTICAL CO.**

642-R St. Paul Street, Rochester 2, New York

☐ I would like a free demonstration of the LRM Balopticon.

☐ Please send me descriptive literature. (Please check Boxes)

NAME ____________________________

ADDRESS ____________________________

CITY ____________________ STATE _______
monies a series of conferences were held which were aimed at coordinating pharmacy manpower and services for efficient use in any future national emergency. In a session over which George D. Beal, chairman of the Association's Council presided, D. W. Bronk discussed the part played by the NRC in pharmaceutical science, and pharmacy in the military services was discussed by the Surgeons General of the Navy and Army and the Air Surgeon. S. H. Dretzka, president of the American Pharmaceutical Association, presided over another session which included papers on "Accomplishments of the National Health Assembly, by J. Donald Kingaley, Assistant Administrator of the Federal Security Agency; "The U. S. Public Health Service," by Surgeon General Leonard A. Scheele; "Medical Implications of Atomic Warfare," by Philip S. Owen, executive director of the Committee on Atomic Casualties; "The National Blood Program of the American Red Cross," by the program's administrator, Ross T. McIntire; "The Selective Service," by Major General Lewis B. Hershey; and "The Council on National Emergency Medical Service," by Richard L. Meiling, secretary of the Council.

A committee of the Botanical Society of America, which is in process of gathering new and outstanding ideas for teaching aids for a general botany course, is soliciting the aid of high school and college teachers of general botany and general biology courses in the hope that they will be willing to share with others any particularly effective demonstration methods or techniques which they are using. Credit will be given to the sources of all ideas embodied in a report to be presented next September. The committee would particularly appreciate copies of local laboratory manuals and outlines of experiments not commonly used in currently published manuals. Suggestions should be mailed to Victor A. Greulach, Texas A & M College, College Station, Texas.

New low-temperature laboratories have recently been opened in the Division of Mechanical Engineering of the National Research Council of Canada. Until now, only very limited laboratory facilities for small-scale tests have been available in Canada, although advanced bases for field testing have been set up as far North as transportation conditions permitted. In the new laboratories there are three cold chambers, the largest of which can accommodate test specimens up to 50 feet in length by 15 feet in width. The refrigeration plant, one of the largest of its kind in Canada, enables temperatures as low as -80° F to be obtained in all of the cold rooms and the achievement of a considerable drop or rise in temperature within a relatively brief period. J. L. Orr, a University of Toronto graduate in engineering physics, is in charge of the laboratories and will direct work on problems ranging from the development of suitable clothing for Arctic use to studies of cold-weather starting and running of engines.

Establishment of a Technical Development Committee on Upper Atmosphere and Interplanetary Navigation by the Institute of Navigation has just been announced by Rear Adm. G. G. McIntosh, the Institute's president. Co-chairmen of the new committee are Paul Rosenberg, president of Rosenberg Associates, of New York, and Samuel Herrick, professor of astronomy, University of California at Los Angeles, and the membership includes: A. G. McNish, chief of the Basic Ionosphere Research Section, National Bureau of Standards; Maj. R. A. Trenkle, First Experimental Guided Missiles Group, Eglin Field, Florida; John C. Bellamy, director, Cook Research Laboratories, Chicago; and Frederick Franklin, Oak Ridge Laboratories. The co-chairmen, in a statement issued last week, point out that advances in rocket engineering and the possibility of using atomic power for propulsion purposes "make it feasible to foresee the propulsion of an uninhabited projectile into space beyond the earth's atmosphere." For the time being, however, attention will be devoted to a study of the purely navigational aspects of interplanetary travel.

An up-to-date list of all national standards approved by the American Standards Association, published last month, is now available free of charge from the Association's offices at 70 East 45th Street, New York City 17.

Rohrer, Hibler and Replogle, a firm which numbers approximately 30 full-time psychologists who are serving as psychological counsel to management in some 176 corporations in this country and the British Commonwealth, has recently announced the following changes with respect to its staff: J. Elliott Janney, formerly secretary of the firm, is now partner in charge of Research and Development, with offices at 520 Terminal Tower, Cleveland 15, Ohio. At the same address, Paul J. Brouwer has assumed the position of regional director, and Lynde C. Steckle, that of staff psychologist, while George Spaché has been appointed staff psychologist in the New York Office. In addition to the home office in Chicago and the Cleveland and New York branches, the firm maintains branches in Dallas and Los Angeles.

Make Plans for—

National Gastroenterological Association, 13th annual convention, June 7-10, Hotel Pennsylvania, New York City.

American Neurological Association, June 14-16, Claridge Hotel, Atlantic City, New Jersey.

American Dairy Science Association, 43rd annual convention, June 14-16, University of Georgia, Athens.

American Society for Engineering Education, June 14-18, University of Texas, Austin.

Myological Society of America, annual foray, June 15-17, Biological Station, University of Michigan, Cheboygan.

American College of Radiology, June 18-20, Continental Hotel, Chicago, Illinois.

American Mathematical Society, June 19, University of British Columbia, Vancouver.

AAAS
Centennial Celebration
Washington, D. C.
September 13-17, 1948

SCIENCE, May 28, 1948, Vol. 107

565