SCIENCE

NEW SERIES Vol. 91, No. 2368

FRIDAY, MAY 17, 1940

SUBSCRIPTION, \$6.00 SINGLE COPIES, .15



This prism is a *reject*, although the user of the refractometer for which it was designed probably could not detect a single fault in its performance. But, merely "good enough" falls below Bausch & Lomb standards.

These standards, based upon rigid inspection, give no quarter to inaccuracy. This is one of many reasons why you can place your trust in the uniform high quality of B&L instruments.

For your next instrument select one that bears the B&L trademark. Write concerning your optical instrument problems, to Bausch & Lomb Optical Co., 642 St. Paul Street, Rochester, N.Y.

BAUSCH & LOMB OPTICAL COMPANY



FOR YOUR EYES, INSIST ON BAUSCH & LOMB EYEWEAR, MADE FROM BAUSCH & LOMB GLASS TO BAUSCH & LOMB HIGH STANDARDS OF PRECISION

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.

FUNDAMENTALS OF COLLEGE PHYSICS

By W. WENIGER

Professor of Physics Oregon State College

704 pp. Illus. \$3.75

AMERICAN BOOK COMPANY

New York Cincinnati Chicago Boston Atlanta Dallas San Francisco THOROUGHNESS is an outstanding feature of this new book. Its sound, clear treatment of the essential principles provides an adequate foundation for more advanced work on the subject.

Motion is the theme around which the presentation is built—motions of a body, motion in media, motions of electrons, etc. Besides the fundamental topics, others of a general, present-day interest to students are given, such as the gyroscope, the radio, and electrical machinery.

A comprehensive teaching equipment is included. Throughout, close correlation has been kept between theory and laboratory. Numerous diagrams and photographs add clearness and interest. The only prerequisites are high school algebra and geometry.

New-1940 B

BUNDY'S

ANATOMY AND PHYSIOLOGY

7th Edition

Revised and Edited
By S. Dana Weeder, M.D.
Formerly Instructor in Anatomy
University of Pennsylvania

Thoroughly revised, this successful textbook presents a clear and concise account of the principles of human anatomy and physiology.

The sections describing the stomach, colon and sympathetic nervous system have been expanded considerably, and the discussions on lymphatic drainage and physiology of the spleen have been brought up to date.

Chapters on the origin and development of blood cells and the endocrine system have been rewritten and in the chapter on vitamins emphasis has been placed on practical considerations.

Many illustrations were re-made and new ones added. 283 Illus. 490 Pages. \$2.75

THE BLAKISTON COMPANY, Philadelphia

Why Smash Atoms?

By ARTHUR K. SOLOMON

A TOM-SMASHING is today one of the most important activities of scientists. Dr. Solomon here explains the work of one type of atom-smasher, the cyclotron, and describes the transforming effects of atom-smashing on the sciences of physics and chemistry, as well as in medicine. He makes clear to the layman the nature, purpose, and results thus far of these epochmaking advances. This is popular science in the best sense of the term, a volume that reveals to the non-scientific reader the great sweep of modern research. Fully illustrated.

186 pages. \$2.50 a copy

HARVARD UNIVERSITY PRESS CAMBRIDGE, MASSACHUSETTS

A TEXTBOOK OF CLINICAL PARASITOLOGY

By David L. Belding, M.D.

This is a highly practical new text adapted to the needs of the medical student. It is the bestillustrated American text on the subject with four full-page color plates and approximately 200 illustrations, mostly original. A special feature is the appendix of technical methods. Concise and up to date. App. 500 pages. \$5.00 (tentative.)

MEDICAL BACTERIOLOGY

By David L. Belding, M.D. and Alice T. Marston, Ph.D. with four collaborators

Condensed and factual. Emphasizes the application of bacteriology to medicine and public health. "The authors attempt to present a discussion of bacteriology primarily for the medical student and the clinician... In this endeavor they have been highly successful."

—American Journal of Clinical Pathology. 630 pages. 43 figures, 47 tables. \$5.00

APPROVED LABORATORY TECHNIC

By John A. Kolmer, M.D. and Fred Boerner, V.M.D.

In this second edition most chapters were entirely rewritten by the authors with the aid of twenty-eight collaborating authorities. This is the recognized authority on clinical, pathological, bacteriological, mycological, parasitological, serological, biochemical and histological methods. 893 pages. 392 illustrations. \$8.00

TEXTBOOK OF HISTOLOGY

By Harvey Ernest Jordan, A.M., Ph.D.

The new, eighth edition of what has been a standard text for twenty-five years. Brought thoroughly up to date with established histological literature. New, well-selected illustrations. New references. Handier size. An excellent revision of a histology text with proven appeal for the medical student. 694 pages. 609 illustrations. \$7.00

ESSENTIALS OF PATHOLOGY

By Lawrence W. Smith, M.D. and Edwin S. Gault, M.D.

A practical, concise treatment of pathology, employing the case history method of presentation. Unusually well-illustrated with photographs of the gross pathology, photomicrographs of histopathology and roentgenograms of pathological alteration in form and function. 909 pages. 679 figures and 13 color plates. \$9.00

A TEXTBOOK OF EMBRYOLOGY

By Harvey Ernest Jordan, A.M., Ph.D. and James Ernest Kindred, Ph.D.

Third edition. Approaches the subject from the standpoint of the usual difficulties of the average medical student. Tells the story of human development logically, without an overload of comparative data, and its application to future interests of the student of medicine is kept constantly in view. 672 pages. 701 illustrations. \$6.50

TEXTBOOK OF BACTERIOLOGY

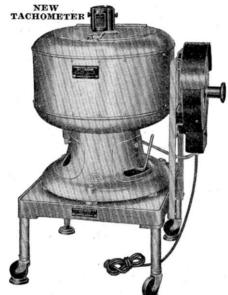
By Hans Zinsser, M.D. and Stanhope Bayne-Jones, M.D.

The new, eighth edition of a famous work. Completely revised and up to the minute. Increased attention given to immunology, with a corresponding increase in the value of this text as a manual of infectious diseases. 1018 pages. 115 figures. Waterproof and chemically resistant cloth binding. \$8.00

D. APPLETON-CENTURY COMPANY, 35 W. 32nd St., New York City

IN SELECTING YOUR NEW CENTRIFUGE CONSIDER:

● Its quality of material and workmanship. ● Actual capacities at higher speeds. ● Motor strength for continuous duty. ● Its adaptability to wide range of accessory equipment. ● The manufacturer's policy in design of new equipment to fit older models. ● Future requirements of your laboratory.





INTERNATIONAL

SIZE 2 CENTRIFUGE

The "Size 2" is a very popular model due to its large overload capacity, power, protective starting device, flexible speed control and portability. Research Laboratories demand this particular centrifuge because of its wide field of usefulness.

NEW SPEED MEASURING DEVICE

A new Indicating Tachometer, especially designed for International Centrifuges, is now built into the Size 2 and Type SB Centrifuges. It gives at a glance the running speed of the machine at any setting on the rheostat.

The new tachometer can be attached to any Size 1 (Type C or Type SB) or Size 2 Centrifuge now in service.

Your Dealer knows International's reputation

INTERNATIONAL EQUIPMENT CO. 352 Western Avenue Boston, Mass.

Makers of Fine Centrifuges

TO MEET THE LATEST STANDARDS OF MILK ANALYSIS ... Castle Incubators

Uniformity of temperature throughout the incubator is a vital factor in milk examination.

The A. P. H. A. recommends 37°C at all levels in the incubator, with a tolerance of + or - 1°C. That is more liberal than the tolerance of Castle Precision Incubators which have always operated with constancy of + or - $\frac{1}{16}$ °C and uniformity of + or - $\frac{1}{16}$ °C, under full load conditions.

They are easily maintained because of the efficient heat distribution and large reservoir of heat which features the Castle Incubator.

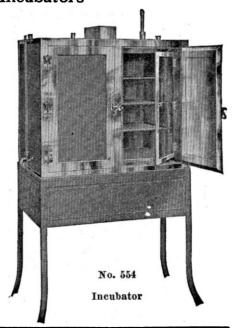
22 Gallons of warm water, accurately controlled, provide thousands of calories of reserve heat to quickly restore heat loss occasioned by opening of door. Heat is transmitted by interior radiation, rather than by convection, hence less variation throughout the loaded chamber. One thermometer is sufficient for accurate temperature measurements. Temperature inside incubator is unaffected by changes in room temperature, if below operating range.

Illustrated is Castle Incubator, Model 554, recommended for milk analysis by the agar plate method. Other models for various bacteriological applications and in various capacities are available. Write—

WILMOT CASTLE COMPANY

1212 UNIVERSITY AVENUE RO

ROCHESTER, N. Y.



NOW AVAILABLE HEXABIONE

REG. U. S. PAT. OFF.

(CRYSTALLINE VITAMIN B. HYDROCHLORIDE MERCK)



 A^{S} a direct result of the isolation, identification, and synthesis of vitamin B_6 in the Merck Research Laboratories, the pure crystalline substance has been made available for investigative and clinical use. In addition to this noteworthy achievement, Merck & Co. Inc., has been privileged to be intimately associated with several of the more notable contributions of research in this field.

The synthesis of vitamin B₁, a brilliant achievement, was first accomplished in the Merck Research Laboratories, and very recently workers associated with these same laboratories have succeeded in identifying and synthesizing another component of the vitamin B complex, pantothenic acid. In addition to these significant contributions, the chemical identification and synthesis of vitamin E (alpha-tocopherol) were carried out in the Merck Research Laboratories.

HEXABIONE

(Vitamin B₆
Hydrochloride Merck)
Supplied in
0.05 Gm. sealed tubes

BETABION

(Thiamin Chloride Merck)
Supplied in
.01 Gm. sealed tubes
0.1 Gm. bottles
1.0 Gm. bottles

CEBIONE

(Ascorbic Acid Merck)
Supplied in
0.1 Gm. sealed tubes
0.5 Gm. sealed tubes
1.0 Gm. sealed tubes

RIBOFLAVIN MERCK

Supplied in
.01 Gm. sealed tubes
0.1 Gm. sealed tubes
1.0 Gm. bottles

NICOTINIC ACID MERCK

Supplied in 1/8 oz. bottles 1/4 lb. bottles 1 lb. bottles

NICOTINAMIDE

(Nicotinic Acid Amide Merck)
Supplied in
1/8 oz. bottles
1/4 lb. bottles
1 lb. bottles

Literature on Request

MERCK & CO. Inc.

Manufacturing Chemists

RAHWAY, N. J.

PHYSIOLOGICAL APPARATUS

for SCHOOLS and COLLEGES



The 10 mm. Magnet—a magnetic signal with self-contained relay. One-half the actual size. The two binding-posts on the casing place in independent circuit an enclosed magnetic key which registers the instant of interruption. The second current may thus be varied at will.

THE Harvard Apparatus Company is incorporated as a non-profit organization for the furtherance of teaching and investigation in the Medical Sciences.

By providing sound apparatus for the student at low cost, it perpetuates an enterprise originating many years ago in the machine-shop of a university laboratory as a contribution to the growth of American physiology.

Its product now goes direct to laboratories on every continent—to high-schools, junior colleges, universities, and institutes for advanced research.

Write for a descriptive catalogue

The HARVARD APPARATUS COMPANY, Incorporated

Dover, Massachusetts

SCIENCE

Vol. 91	FRIDAY, MA	AY 17, 1940	No. 2368
The American Association for the Adversaries: Preliminary Announcement of the Science: Preliminary Announcement of the Science: Obituary: Dr. Glenn E. Cullen: Professor I Robinson. Recent Deaths and Memor Scientific Events: The British Association; The America Association and the U.S. Treasury I The National Farm Youth Foundation Fellowships of the National Resear Medal Day of the Franklin Institute; ican Academy of Arts and Sciences; The Philosophical Society Scientific Notes and News	HOWARD W. ials	Reports: Appropriations of the Rockefeller In the Medical and Natural Sciences in Special Articles: Association of the Heterogenetic Amaterial in Normal and Tumor Titable at High Speed: Professor Jaelvin A. Kabat. Electrophoretic Hyperimmune Sera: Dr. J. van did Dr. Ralph W. G. Wyckoff. Of Excretion of "Free" Sulfapyridi V. Scudi Science News SCIENCE: A Weekly Journal devo	Antigen with a ssues Sedimen- cob Furth and ic Analysis of ER Scheer and n the Urinary ne: Dr. John 8
Discussion: Color Effects Observable from Fluoresc Dr. Gorton R. Fonda. Mercury Poi Arthur C. Giese. Is Sulfanilamide B under "Anaerobic" Conditions?: Dr. Fox, Jr. An Illustrated Catalogue and Early Cenozoic Plants of Nort Professor Erling Dorf. The Peace of Scientific Workers: Dr. Peyton Rol The National Academy of Sciences: Abstracts of Papers	cent Lamps: soning: Dr. acteriostatic CHARLES L. of Mesozoic h America: e Resolution US	ment of Science, edited by J. McKeen lished every Friday by THE SCIENCE PI Lancaster, Pa. New York City: Grand Centra	N CATTELL and pub- RESS Garrison, N. Y. al Terminal ngle Copies, 15 Cts.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

PRELIMINARY ANNOUNCEMENT OF THE SEATTLE MEETING

Edited by Dr. F. R. MOULTON

PERMANENT SECRETARY

From June 17 to June 22, inclusive, the association will hold its summer meeting in Seattle, Washington, in cooperation with the Pacific Division. This will be the one hundred sixth meeting of the association and the twenty-fourth meeting of the Pacific Division. On two previous occasions the Pacific Division met in Seattle, the first in 1920 and the second in 1936. Twenty-seven affiliated and independent societies will participate in the Seattle meeting.

The fact that the association will not meet elsewhere than in Seattle this coming June adds nothing technically to the dignity of the meeting, for every meeting of the Pacific Division and of the Southwestern Division is a meeting of the association, and might well be announced as such. The vast size of our country makes it advisable to have administrative machinery for organizing and holding meetings on the Pacific Coast and in the great Southwest. The officers of the Pacific Division and the members of the association resident in its territory will be primarily responsible for the meeting in Seattle. The association refrains from holding a meeting elsewhere simply to encourage its members from the East to go westward and become better acquainted with their western colleagues. Many scientists from the Pacific Coast attend scientific meetings in the East; return visits will also be advantageous.

phoretic pattern did not differ essentially from that of serum from a horse that had been producing pneumococcic antiserum for ten years. We have also found no significant difference on electrophoresis between tetanus antitoxic sera drawn from horses four and 30 months after beginning hyperimmunization.

Recently we have completed the electrophoretic study of the sera of horses hyperimmunized with a number of antigens of bacterial origin. Some have shown with more or less prominence the T-component absent in normal sera; others have shown no T but, like our pneumococcic antisera, an enhanced y-glubulin peak. Antitoxic sera against Cl. welchii, Cl. sordelli and Cl. oedematiens, as well as against C. diphtheriae and Cl. tetani show large T components. Scarlet fever, botulinus, staphylococcus, histolyticus and vibrion septic antitoxic sera have also contained some T-globulin. In certain of these sera there has been more T than y. in others it has been present in small amounts only. The amount of γ in these sera has been greater than in normal sera. Several antisera against the meningococcus have resembled our antipneumoncoccic sera both in the extraordinarily large amounts of γ and in the absence of detectable amounts of T. Sera against the organisms of hemolytic septicemia and swine erysipelas have also been very rich in y. The latter serum has shown a small amount of a component having approximately the mobility of T. A serum against the Shiga and Flexner strains of dysentery bacteria has contained both T and a moderately enhanced Y. These various sera have been taken, some from freshly immunized horses, others from old serum producers.

All these results make it clear that horses respond to some antigens by an increase in the already existing γ-globulins, to others by the production of a new T component. In the experiments here reported all antitoxic sera have contained T while the most impressive increases in y have been seen in anti-carbohydrate sera. More work will, however, be needed before we can specify those qualities of an antigen which determine the production of a T or a γ antibody.

> J. VAN DER SCHEER RALPH W. G. WYCKOFF

LEDERLE LABORATORIES, INC., PEARL RIVER, N. Y.

ON THE URINARY EXCRETION OF "FREE" SULFAPYRIDINE

CERTAIN theories relative to the mode of action of the sulfanilamide series of drugs involve oxidationreduction mechanisms. We have isolated a monohydroxyl derivative of sulfapyridine from dog urine following the administration of the drug. The compound melts at 180°-181° (corr.) and depresses the melting point of sulfapyridine. The ultra-violet absorption data are shown in Fig. 1. The compound gives a

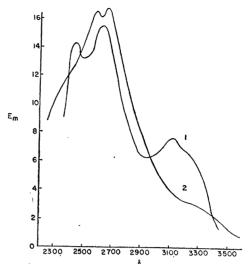


Fig. 1. Ultra-violet absorption in aqueous solution. 1. Sulfapyridine. 2. Hydroxy-sulfapyridine.

positive diazo and ferric chloride reaction.

Calculated for C11H11O2N2S:

C = 49.81; H = 4.15; N = 15.84.

Found.

C = 50.33; H = 4.26; N = 15.96.

A glucuronate of this substance has been isolated and characterized as its silver salt.

Calculated for C₁₁H₉O₂N₃SAg·OC₆H₈O₆Ag·3H₂O:

C = 28.77; H = 3.24; N = 5.92: Ag = 30.46; $H_2O = 7.61$. Found:

C = 28.98; H = 3.38; N = 5.73; Ag = 30.16; $H_2O = 6.85$.

Since the hydroxy-sulfapyridine glucuronate is very water-soluble, this product is of interest in relation to the problem of the formation of renal calculi.

JOHN V. SCUDI

LABORATORY OF RESEARCH AND DEVELOPMENT, MERCK AND Co. INC., RAHWAY, N. J.

BOOKS RECEIVED

CUSHMAN, JOSEPH A. Foraminifera; their Classification Third edition, revised. Pp. viii + and Economic Use. Harvard University Press. 535. Illustrated. Figure 1. The stated. Harvard University Fress. \$6.00. Egiloff, Gustav. Physical Constants of Hydrocarbons. Vol. II, Cyclanes, Cyclenes, Cyclynes and Other Alicyclic Hydrocarbons. Reinhold. \$12.00. Grady, Roy I. and John W. Chittum. The Chemist at Work. Pp. xv+422. Journal of Chemical Education,

Easton, Pa.

HINSHELWOOD, C. N. The Kinetics of Chemical Change. Pp. vi + 274. 35 figures. Oxford University Press.

The Geology of China. LEE, J. S. Nordemann. \$9.00. figures.

RICHARD J. Rocky Mountain Trees. PRESTON, Iowa State College Press, 1xxxi + 285.Illustrated. Ames. \$2.00.

SOLOMON, ARTHUR K. Why Smash Atoms? Pp. xii+ 174. Illustrated. Harvard University Press. \$2.50. WHITE, HARVEY E. Classical and Modern Physics. Pp. Van Nostrand. viii + 712. Illustrated.

Outstanding Wiley Successes in the Sciences



BLACKWOOD'S

INTRODUCTORY COLLEGE PHYSICS

65 Adoptions in 1939-1940

(Published in 1939)

By OSWALD H. BLACKWOOD, Professor of Physics, University of Pittsburgh

Already an established success

Blackwood's "Introductory College Physics" has proven eminently satisfactory for the purpose for which it was written; namely, for a course in physics for non-technical students who have not previously studied the subject. Proof of its popularity will be found in the extensive list of adoptions for this year—65 in number. Further verification is seen in such comments as those shown below.

"Deserves the highest praise"

"Professor Blackwood's attempt at producing a more simple, interesting and usable text for non-technical students deserves the highest praise. The whole story of physics certainly cannot be completely told in the first course. Part of it can, and he seems to have done very well in his choice of omissions. His treatment of mechanics pleased me especially."

-Professor D. P. RANDALL, Syracuse University

"The author's aim has been to write a book which will arouse the interest of students whose chief leaning is not toward physics and mathematics, and to present to them a clear and understandable account of both the principles and the applications of this great and growing science. There is need for books at this level, and in this simple and readable text, Professor Blackwood has filled the need in commendable fashion. . . . One of the marked features of the book is its careful consistency, combined with simplicity. There is a degree of exactness of statement not often met in semi-popular texts."

-Professor Richard M. Sutton, Haverford College, in "Review of Scientific Instruments"

487 pages

417 illustrations

6 by 9

\$3.50

JOHN WILEY & SONS, INC., 440-4th AVE., NEW YORK

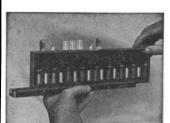


ASCARIS

Recently completed a new series of slides of *Mitosis* in Ascaris megalocephala bivalens. Dr. Powers considers them our finest product. Prices as in No. 16 catalog. Send for sample.

POWERS & POWERS, Lincoln, Nebraska.

TAYLOR NON-FADING LIQUID Color Standards

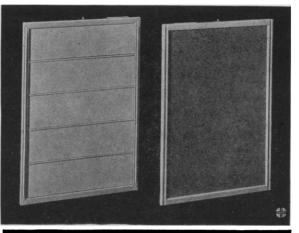


Taylor Slide Comparators, with guaranteed non-fading liquid color standards, are ideal for general pH and chlorine control and for control of phosphates in boiler

Molded from plastic, work on the slide principle.

Full information on Comparators and Coleman Glass Electrode.
W. A. TAYLOR & CO., INC.

W. A. TAYLOR & CO., INC. 891 Linden Ave. Baltimore, Md.



Adams MICROTECHNIC SYSTEM

for handling and storing microscope slides during and after preparation

Three units of equipment make up this system . . .



1.	MICROTECHNIC TRAYS
	for holding microscope slides
	$50 \ 3 \times 1'', 35 \ 3 \times 1\frac{1}{2}'', 25 \ 3 \times 2''$
	1 dz. \$12.50 dz.

1	dz.	 \$12.50	đz.
3	dz.	 \$ 11.25	dz.
6	dz.	 \$10.00	dz.

- 2. MICROTECHNIC CABINET for holding the trays ... \$35.00

Complete unit with 25 trays as illustrated ... \$65.00

ADVANTAGES . . .

- 1. Easy and safe handling of slides.
- 2. Trays will not warp, even in oven.
- 3. Multiplies utility of desk space.
- 4. Easy identification and access to each slide.
- 5. Surface of tray resists action to usual laboratory solvents.
- Tongue and groove arrangement permits any tray to be removed from stack and permits safe stacking.
- 7. Aids in organization of work.
- 8. Protects against damage.
- 9. Accommodates $3 \times 2''$, $3 \times 1\frac{1}{2}''$, and $3 \times 1''$ slides.

Send for descriptive circular No. 229S

CLAY-ADAMS CO., 44 East 23rd St. New York, N. Y.

