

SCIENCE

NEW SERIES
VOL. 93, No. 2413

FRIDAY, MARCH 28, 1941

SUBSCRIPTION, \$6.00
SINGLE COPIES, .15



The new Fisher AC Model Electrophotometer permits colorimetric analyses to be made accurately, quickly and simply wherever the color of the solution varies in a definite manner with the concentration of a constituent. It has unique, valuable features which now enable the laboratorian to employ this rapid method for control or research work.

The Electrophotometer is an improved instrument that operates from any 110 volt, 50–60 cycle line. With it, the user can detect very slight color intensity differences because the photoelectric system it employs is considerably more sensitive than the human eye. The Electrophotometer is extremely simple to operate; there are no complicated manipulations and each determination requires less than a minute. Once a calibration is made, subsequent analyses can be conducted as rapidly as the simple operations can be performed.

The AC Model Electrophotometer obviates the need for a storage battery since it employs

two photocells to compensate for line voltage fluctuations. It is easily standardized and readings can be made in a few seconds.

All essential parts needed to conduct an analysis are furnished with the instrument, including the built-in galvanometer, set of three standard filters and three 23-ml. Absorption Cells. Typical procedures and step-by-step directions are also supplied.

For 110 volts, 50–60 cycle A.C. only. **Complete, \$150.00.**

When pale-colored solutions are to be analyzed, the Rectangular Absorption Cells providing a "depth" of 50 mm. and the Rectangular Cell Adapter should be employed. These cells are \$4.25 each and the Adapter is \$3.25.

The Electrophotometer will analyze samples as small as 3 ml. when the Micro Attachment Assembly is employed. It includes two Micro Absorption Cells, a Micro Cell Adapter, and a supplementary lens, and can be obtained complete for \$9.00.

Manufactured and Distributed by

FISHER SCIENTIFIC CO.



EIMER AND AMEND

711–723 Forbes Street, Pittsburgh, Penna.

205–223 Third Avenue, New York, N. Y.

Headquarters for Laboratory Supplies

*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.*

Just published . . .

UNIVERSITY OF CALIFORNIA HOSPITAL FORMULARY *and Compendium of Useful Information*

TABLE OF CONTENTS	
	Page
Prescription Writing	1-4
Sizes of Prescriptions and Orders	5
Vehicles and Colors	6-9
Drugs Subject to Federal and State Regulations	10, 11
Buffered and Isotonic Solutions	12-18
Table of pH Indicators	18
Tables of Trade-Marked Preparations	19-29
Antiseptics	30
Drugs for Diagnostic Purposes	31, 32
Endocrine Preparations	33-36
Vaccines, Serums, and Antitoxins	37-43
The Vitamins	44-51
Drug List	52-98
Therapeutic Index	99-123
University of California Formulae	124-140
Parenteral Fluids	141, 142
Pediatrics Therapeutic Index and Procedures	143-155
Well-Baby Clinic	156-158
Dental Formulary Drug List	159-165
Dental Formulae	166-172
Chronology of Dental Development	173
Chart Indicating Types of Diet and Their Uses	174-176
Diet and Regime for Reduction of Sodium Concentration in Treatment of Menier's Disease	177, 178
Average Heights and Weights	179, 180
Obstetrical Data	181, 182
X-Ray Examinations and Consultations	183-187
Laboratory and Clinical Procedures	188-243
Common Emergencies	244-246
Treatment of Burns	247
Treatment of Acute Poisoning	248-253
Table of International Atomic Weights	254, 255

4 1/4" x 6 7/8", flexible binding, \$2.00

UNIVERSITY OF CALIFORNIA PRESS
BERKELEY AND LOS ANGELES

Plants and Man HYLANDER and STANLEY

This new textbook presents material for a one semester course in the vital, cultural and practical aspects of botany. It is written to meet the needs of the college student who has a general interest in botany but who will not make this subject his major. The material is organized into six parts each dealing with a basic relationship of plant life to man. A section on the natural history of wild flowers and ornamental plants increases the student's enjoyment of plant life.

By Clarence J. Hylander, Ph.D., Associate Professor of Botany, and Oran B. Stanley, Ph.D., Instructor in Botany, Colgate University.

308 Illustrations. Glossary. 518 Pages \$3.00

THE BLAKISTON COMPANY, Philadelphia

NEW (3d) EDITION

JUST READY

Plant Ecology

By W. B. McDOUGALL

Regional Biologist, Section on National Park Wildlife,
Fish and Wildlife Service, Santa Fe, New Mexico

Octavo, 285 pages, illustrated with 119 engravings.
Cloth, \$3.00, net.

The science of plants as they live together is fundamental for successful work in this field. This is not only an excellent textbook on a fundamentally important and practical subject, but also a book for every florist, nurseryman and other commercial horticulturist. It offers a short course for colleges and is a handbook of great value for everyone.

LEA & FEBIGER

WASHINGTON SQUARE PHILADELPHIA, Pa.

SCIENTIFIC BOOKS

—New and Secondhand—

SCIENTIFIC, TECHNICAL
AND MEDICAL BOOKS OF
ALL PUBLISHERS

Orders dispatched by return mail

Write for catalogues stating
particular interests.

H. K. LEWIS & CO. LTD.

136 GOWER STREET, LONDON, W.C.1, ENGLAND

LIFE AND DEATH AT LOW TEMPERATURES

By B. J. Luyet and P. M. Gehenio, St. Louis University
A monograph on latent life and on injury and death by cold. It includes a review of several hundred investigations on the lower limit of vital temperatures and a discussion of the physical states (vitreous, crystalline, supercooled) of matter and of protoplasm at low temperatures. 341 pages, 33 figures, net \$4.50.

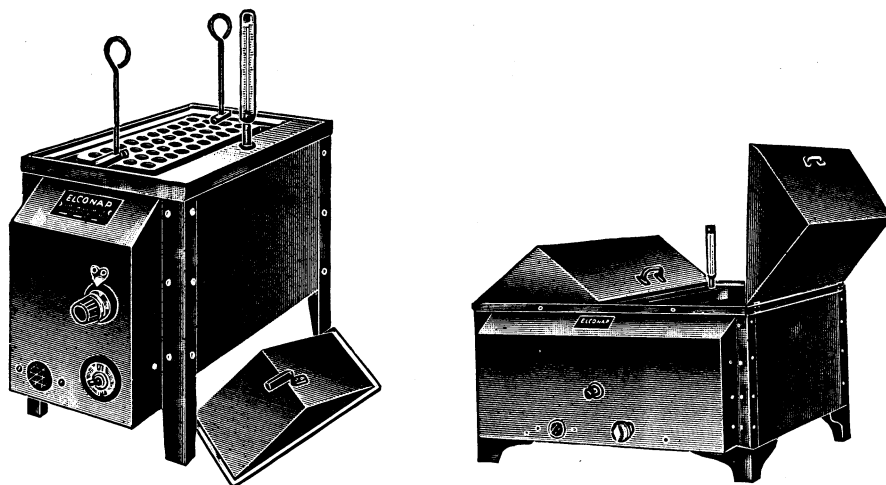
Order from
BIODYNAMICA, NORMANDY, MISSOURI

HELL'S BELLS

By A. S. PEARSE

Includes essays on Being a Member, Success, Hell's Bells, Adventure, and thirteen others.

x + 121 pp., \$2.00 Postpaid
The Seeman Printery
Durham, N. C.



"ELCONAP" CONSTANT TEMPERATURE WATER BATHS **of polished Monel Metal. Temperature range from room to 100°C**

"ELCONAP" electrically heated water baths are built for precise performance. They are ideally suited to Wassermann, Kolmer, and Kahn techniques, differentiation of spore-forming bacteria, and similar work requiring constant temperature maintenance.

Construction. Of polished Monel Metal interior and exterior to resist corrosion or rust. Asbestos transite insulation between walls. A special Deflecting Septum radiates the heat and accelerates circulation of the water.

Thermoregulation. A sensitive bi-metallic thermoregulator insures positive temperature regulation within 0.5° C. The expanding member of the regulator extends practically the full length of the bath. The thermostat itself is fully enclosed. A condenser prevents arcing. A pilot light shows when contact is made or broken.

Heating Elements. The special long life heating elements of nickel chromium resistance wire are enclosed in refractory bars and sheathed in Monel Metal tubes extending the full length of the bath.

Guarantee. Fully guaranteed against mechanical defects for FIVE YEARS.

"ELCONAP" water baths are available in four sizes and can be fitted with gable type or concentric ring covers.

Complete information and prices will be sent on request.

WILL CORPORATION, ROCHESTER, NEW YORK

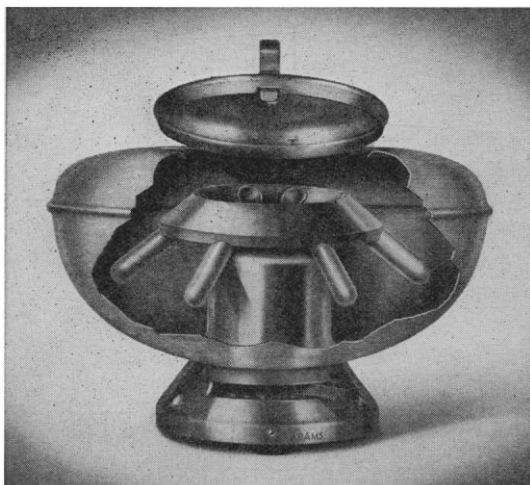
Offices and Warehouses

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

LABORATORY APPARATUS AND CHEMICALS

4600 R. P. M.

on D. C. with six 15 ml. tubes loaded
on A. C. 3700 R. P. M. { R.C.F. on A. C. 2000
on D. C. 3100



CT-1200/D Angle-Head Centrifuge

Adams Senior ANGLE-HEAD Centrifuges

These centrifuges offer important advantages over the conventional units. They utilize the new angle principle—the tubes being suspended at a fixed 52° angle—thus, faster sedimentation is achieved by the shorter distance particles are required to travel . . . creating mass, and reaching the bottom more quickly. When at rest, the tubes remain in the angular position and no stirring up of sediment results.

CT-1200/D ADAMS SENIOR ANGLE-HEAD CENTRIFUGE for SIX 15 ml. TUBES, complete with tubes and shieldsEach \$62.50
Same without tubes or shieldsEach \$59.50

CT-1210/D ADAMS SENIOR ANGLE-HEAD CENTRIFUGE for TWO 50 ml. TUBES and TWO 15 ml. TUBES, complete with tubes and shieldsEach \$62.50
Same without tubes or shieldsEach \$59.50

CT-1220/D ADAMS SENIOR ANGLE-HEAD CENTRIFUGE for FOUR 50 ml. TUBES, complete with tubes and shieldsEach \$62.50
Same without tubes or shieldsEach \$58.50

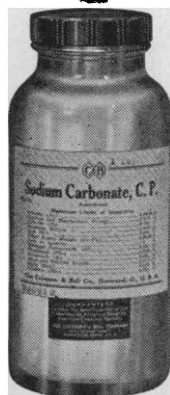
All models are illustrated and described on pages 1 to 13 in our new Catalog No. 102SC—LABORATORY INSTRUMENTS and SUPPLIES. If you did not receive your copy, write for one on your Department letterhead, please.

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



ANALYTICAL REAGENTS

Coleman & Bell



Analytical Reagents are manufactured to meet definite standards of purity, including the specifications of the Committee on Analytical Reagents of the American Chemical Society. Our list includes all of the common items and many rare and unusual compounds suitable for special analytical procedures.

Catalog upon request

THE COLEMAN & BELL CO.
C&B MANUFACTURING CHEMISTS
NORWOOD, OHIO, U. S. A.

NEW and IMPROVED

LaMotte Falling Drop Densimeter

(Two Models)

For determining blood proteins, albumin-globulin ratio and specific gravity of body fluids. These units are produced exclusively with the cooperation of H. G. Barbour and W. F. Hamilton, and approved by them.

This outfit is now available in 2 models—the larger model comes complete for \$65 and the small model at \$35. Prices F.O.B. Towson, Md. Send for complete information.

LaMotte Chemical Products Co.
Dept. "H" Towson, Baltimore, Md.

Bargains in New and Used Glasses! All makes,



Size & 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.*

THE SCIENCE PRESS PRINTING CO.

PRINTERS OF
SCIENTIFIC AND EDUCATIONAL JOURNALS,
MONOGRAPHS AND BOOKS

Correspondence Invited
LANCASTER, PENNSYLVANIA

GAERTNER

SIMPLE SPECTROSCOPE (Bunsen-Kirchhoff type) with **WAVE-LENGTH SCALE** for instruction and research

featuring:

Scale reading from 400μ to 800μ

Objectives 20 mm dia, 125 mm e.f.l.

Producing brilliant spectrum of good definition

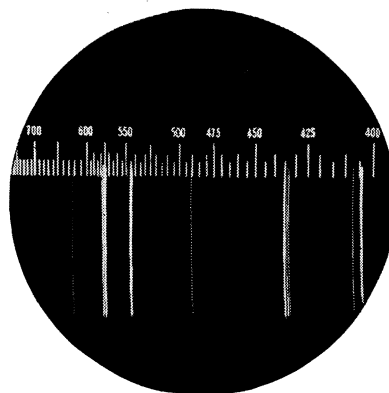
Ideal instrument for college laboratories

Simple and rugged construction \$60.00

Delivery of **L 202** from stock

For spectrosopes producing longer spectrum, refer to catalog L 2

THE GAERTNER SCIENTIFIC CORPORATION
1204 Wrightwood Avenue Chicago, U. S. A.



For Covering Histological Sections on Slides

These superior media are inert, high-melting, water-white synthetic resins having 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, and will not cause stains to fade with age because they are absolutely neutral and remain so.

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

Send for booklet "Neville Clarite Mounting Media"

THE NEVILLE COMPANY
PITTSBURGH • PA.

LABORATORY SUPPLIES

AMERICAN-MADE GIEMSA STAIN
for blood smears.

We manufacture a high grade
GIEMSA STAIN.

\$2.00 for 2 ounces.

Stains and Reagents carefully made and tested on actual cases.



Write for Catalogue.

GRADWOHL LABORATORIES
3514 Lucas Avenue
St. Louis, Missouri



Edward Bausch Microscope Maker

WHILE Pasteur and his contemporaries were fighting the combined forces of superstition and disease to lay the foundations for modern bacteriology, another young man was designing a microscope that would help immeasurably in spreading the benefits of science to all mankind.

While Pasteur was proving that heating would destroy the organisms that were making French wines turn bitter, and perfecting the pasteurizing process that makes his name immortal, in America, Edward Bausch was computing his own objectives, grinding his lenses and fitting the parts for the first Bausch & Lomb Microscope.

While Pasteur was proving his procedure for the cure of rabies by saving the life of the little Alsatian

peasant, Joseph Meister, Edward Bausch was working day and night to demonstrate his belief that quality microscopes could be made in quantities and at such prices as to bring them within the reach of all students and research workers.

Today—you'll find Bausch & Lomb Microscopes in all the far corners of the world. Scientists in education, medicine and industry alike, know that no better optical instruments can be had than those bearing the Bausch & Lomb Trademark.

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. 93

FRIDAY, MARCH 28, 1941

No. 2413

<i>The American Association for the Advancement of Science:</i>	
Each After His Kind: DR. LEON J. COLE	289
Robert Kennedy Duncan: PROFESSOR ALEXANDER SILVERMAN	294
<i>Obituary:</i>	
Sir Oliver Lodge: DR. W. F. G. SWANN. Recent Deaths	296
<i>Scientific Events:</i>	
Research Laboratories at Princeton of the Radio Corporation of America; Refugee Scholars; Award of Prizes of the American Chemical Society; Lectures on Infantile Paralysis; The Board for the Investigation of Epidemic Diseases in the Army	297
Scientific Notes and News	300
<i>Discussion:</i>	
Proposed Glacial Map of North America: PROFESSOR RICHARD FOSTER FLINT. The Origin of the Ballistocardiograph: DR. HAROLD LAMPORT. The Early History of Research with <i>Drosophila</i> : DR. C. B. DAVENPORT	303
<i>Quotations:</i>	
Science and the Moral Order	306
<i>Scientific Books:</i>	
Scientific Computation: DR. FRANK SCHLESINGER. John Alfred Brashear: VIRGINIA MCKIBBEN	307

Special Articles:

Partial Protection of Rats by Riboflavin with Casein against Liver Cancer Caused by Dimethylaminoazobenzene: DR. C. P. RHOADS and OTHERS. Inhibition of Lipase Activity in Raw Milk: DR. N. P. TARASSUK and PROFESSOR G. A. RICHARDSON. Thiuram Sulfide for Turf Diseases: GEORGE E. HARRINGTON	308
---	-----

Scientific Apparatus and Laboratory Methods:

New Paraffin-Resin Infiltrating and Imbedding Media for Microtechnique: RICHARD A. GROAT. A Microfilm Camera: HERMAN BRANSON	311
--	-----

Science News	8
--------------------	---

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.

EACH AFTER HIS KIND¹

By Dr. LEON J. COLE

DEPARTMENT OF GENETICS, UNIVERSITY OF WISCONSIN

HAVING chosen a biblical title for my talk this evening, I may well conform to classical, and clerical, precedent by following it with an appropriate text. My text, then, is taken from the first and second chapters of the Book of Genesis.

And God said, Let the earth bring forth grass, the herb yielding seed, and the fruit tree yielding fruit after his kind, whose seed is in itself, upon the earth: and it was so.

And God created great whales, and every living creature that moveth, which the waters brought forth abundantly, after their kind, and every winged fowl after his kind: and God saw that it was good.

And out of the ground the Lord God formed every beast

¹ Address of the retiring vice-president and chairman of the Section for the Zoological Sciences of the American Association for the Advancement of Science, Philadelphia, December 31, 1940.

of the field, and every fowl of the air; and brought them unto Adam to see what he would call them: and whatsoever Adam called every living creature, that was the name thereof.

And Adam gave names to all cattle, and to the fowl of the air, and to every beast of the field; . . .

Thus we see that the science, or at any rate the art, of nomenclature had a simple and auspicious beginning. Not only was Adam assured on the highest authority that "every beast of the field, and every fowl of the air" would continue to reproduce with fidelity "after his kind," but that whatever names he should give to them would stick—a boon that would be greatly appreciated by present-day taxonomists. Verily, the Garden of Eden at that time was a nomenclator's paradise, for every species was a new one and there was no need to search through dusty tomes for

the content of LX-291 resin increases. The mixtures are most readily prepared by blending the weighed portions of paraffin and resin at a temperature of about 170° C., and filtering. Five per cent., 10 per cent., 20 per cent. and 30 per cent. solutions have been used in practical work, though solutions of higher concentration have been made. All melt over a range of several degrees, the lower limit of each being within one degree of 55° C. A paraffin oven set at 59° C. is satisfactory for all.

Best results are obtained by infiltrating tissues in pure paraffin, in a 5 per cent. mixture or in a 10 per cent. mixture, and imbedding in a harder medium. The hardness of that part of the block composed of tissue plus infiltrating medium should be about equal to, but in any event should not exceed, the hardness of that part consisting of imbedding medium. It is desirable to use a wetting agent in the fluid used to float the sections on the slide, especially for thinner ones where incorrect infiltrating and imbedding media may result in production of fine creases in the tissue of the section. If the section is overheated on the slide or if the fluid is allowed to cool too long before it is drained off, the imbedding medium will shrink slightly, but the tissue will not.

So much of the relative success of cutting sections depends upon the degree of perfection of the knife edge that no attempt will be made here to list the range of thickness of sections which can be cut best with each paraffin-resin imbedding (not infiltrating) medium. Under comparable conditions in one certain case, the following observations were made. With a 10 per cent. solution as the imbedding medium, sections thicker than 12 μ failed to ribbon well, while sections thinner than 4 μ were deemed to be too wrinkled to be designated as good, although those of 3 μ and 2 μ were usable. With a 50 per cent. solution as the imbedding medium, sections of 1 μ were the only ones that would ribbon. These sections exhibited about the same horizontal compression as did the 5 μ sections of the 10 per cent. mixture, albeit the ribbon was so light that it was very difficult to handle. Invariably, as the medium becomes harder the range of thickness of sections which can be cut well becomes narrower and shifts downwards. Thicker sections in each range show less horizontal compression than thinner sections, but among ranges this horizontal compression of sections in comparable parts of the ranges is about equal.

RICHARD A. GROAT

DEPARTMENT OF ANATOMY,
UNIVERSITY OF WISCONSIN

A MICROFILM CAMERA

THE recent discussions of equipment for microfilming have overlooked one means of making a truly precision camera suitable for short-run and volume work

in the small school with limited facilities. This equipment can easily be built around one of the discontinued 35 mm moving picture cameras which are still to be found on secondhand shelves. The author picked up such a camera for \$10, mounted a shutter before the lens to produce a camera suitable for microfilming in color and in black and white. The lens is unquestionably superior to those found in the less expensive miniature cameras; the camera is ruggedly constructed and holds enough films for the photographing of a small volume on a single roll—250 single frame pictures.

The camera is a Sept, a spring-driven camera with a color-corrected, anastigmatic f 3.5 lens, popular in the days of silent films with the many eclectic news cameramen. This camera with the prefixed shutter may be mounted on a stand such as that described by English¹ to give an assembly capable of producing microfilm equal to that of many commercial laboratories.

The writer reads his microfilm in two visual magnifiers,² mounted on illuminated bases which were made at a cost of approximately \$1.00 each. Two readers are indispensable for cross-referring; but possibly the chief advantage in having two readers is that they enable one to photograph the even-numbered and odd-numbered pages on different rolls, thus eliminating the moving and centering of the copy after each exposure; a roll goes into each machine and they are then used alternately.

HERMAN BRANSON

DILLARD UNIVERSITY

¹ F. L. English, *American Photography*, 32: 825, 1938.

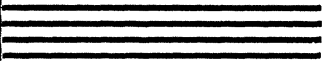
² Herman Branson, *School, Science and Mathematics*, 40: 411, 1940.

BOOKS RECEIVED

- ALLEN, ARTHUR A. *Ornithology Laboratory Notebook*. Fourth edition, revised. Pp. iii+204. Illustrated. Comstock. \$3.00.
- BURDON, R. S. *Surface Tension and the Spreading of Liquids*. Pp. xii+85. 19 figures. Cambridge University Press, Macmillan. \$1.75.
- GOURLY, JOSEPH H. and FREEMAN S. HOWLETT. *Modern Fruit Production*. Pp. vii+579. 87 figures. Macmillan. \$4.50.
- HU, HSEN H. and RALPH W. CHANEY. *A Miocene Flora from Shantung Province, China. Part I, Introduction and Systematic Considerations. Part II, Physical Conditions and Correlation*. Pp. vi+147. 57 plates. Carnegie Institution of Washington. \$3.25.
- LIPMAN, J. G., J. S. JOFFE and ADRIENNE B. CONYBEARE. *Analyses of United States Soils. Section I; North Atlantic States*. New Jersey Agricultural Experiment Station, New Brunswick. \$0.50.
- SILVERMAN, MILTON. *Magic in a Bottle*. Pp. xi+332. Macmillan. \$2.50.
- Svenska Linné = Sällskapetets Arsskrift. Arg. XXIII, 1940*. Pp. 121. Illustrated. Almqvist and Wiksells, Uppsala.
- WHITBECK, R. H. and V. C. FINCH. *Economic Geography, a Regional Survey*. Fourth edition, revised. Pp. xii+647. 315 figures. McGraw-Hill. \$3.50.

NEW WILEY BOOKS

Ready April 1941



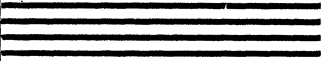
THE CHEMISTRY OF POWDER AND EXPLOSIVES, Volume I

By **TENNEY L. DAVIS**, *Professor of Organic Chemistry, Massachusetts Institute of Technology.*

A textbook for senior and graduate students of chemistry and chemical engineering. The modes of behavior of explosive substances and the phenomena, both chemical and physical, which they exhibit, form the subject matter.

Approximately 208 pages; 50 illustrations; 5½ by 8½;

Probable price, \$3.00

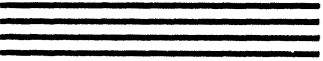


FORESTRY IN FARM MANAGEMENT

By **R. H. WESTVELD**, *Professor of Silviculture, University of Florida,* and **RALPH H. PECK**, *Assistant Professor of Forestry, University of Missouri.*

Designed to show the value of farm forests, how to handle them, and how to convert them into farm assets. Fundamental principles are stressed in the body of the book. All phases of farm forestry are covered, including wildlife management.

Approximately 354 pages; 88 illustrations; 6 by 9; Probable price, \$3.00



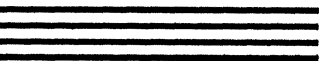
CHEMICAL ARITHMETIC

By **SAUL B. ARENSEN**, *Professor of Inorganic Chemistry, University of Cincinnati.*

A thoroughly revised edition of this well-known book, offering a large collection of problems and methods of solution, properly graded for use in a course in chemical arithmetic or as part of a course in general chemistry.

Second Edition; Approximately 138 pages; 14 illustrations;

5½ by 8½; Probable price, \$1.50

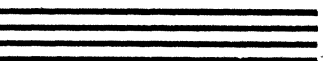


DANA'S MANUAL OF MINERALOGY

Revised by **CORNELIUS S. HURLBUT, JR.**, *Associate Professor of Mineralogy, Harvard University.*

This book is designed specifically for the elementary course for undergraduates. The new edition includes many changes, such as: a thorough revision of Part I on crystallography; a rearrangement of the classification of minerals; a new section called Mineral Uses; and a Mineral Index.

Fifteenth Edition; 480 pages; illustrated; 6 by 9; Probable price, \$4.00



CHEMISTRY OF PULP AND PAPER MAKING

By **EDWIN SUTERMEISTER**, *Research Chemist, S. D. Warren Company.*

The aim of this book is to present in as simple language as possible the chemical aspects of the pulp and paper industry which will enable the reader to understand the methods of manufacture. Thirteen specialists have contributed material.

Third Edition; Approximately 570 pages; 98 illustrations;

6 by 9; Probable price, \$6.50

JOHN WILEY & SONS, INC.
440 FOURTH AVENUE, NEW YORK, N. Y.