May 1945 Publications

PRINCIPLES OF RADIO

By KEITH HENNEY, Editor, "Electronics"

An elementary presentation of radio principles, revised to include material on such important topics as wave guides, velocity modulation tubes, frequency modulation, Klystrons, ultra high frequency techniques and apparatus. Emphasis is placed on recent developments and future methods. As in former editions, the book is written for the student with little background in radio, and the language is clear and non-technical. Problems are given to show the application of the principles explained.

Fifth edition; 542 pages; 5½ by 7½; $3.50

PLANE AND SPHERICAL TRIGONOMETRY

By H. A. SIMMONS, Professor of Mathematics, Northwestern University, and GREENVILLE D. GORE, Professor of Mathematics, Central Y.M.C.A. College of Chicago

This greatly enlarged second edition begins with the trigonometric functions of the general angle, instead of the positive acute angle, and includes precisely the solid geometry needed for the study of spherical trigonometry. The book contains not only theoretical spherical trigonometry, but a large number of applications, including introductory navigation and certain elementary problems of astronomy. There are also chapters on Complex Numbers and the Slide Rule.

Second edition; Approximately 511 pages; 5½ by 8½; Probable price $2.75

DYNAMIC METEOROLOGY

By J. HOLMBOE, W. GUSTIN, and G. FORSYTHE; all at the Department of Meteorology, University of California at Los Angeles

The theoretical background needed by the practical meteorologist, this textbook contains only that material considered indispensable for the meteorologist and weather forecaster. This is probably the only book that starts from the fundamental principles of physics and develops the tools of thermodynamics and hydrodynamics needed for a thorough understanding of atmospheric processes. Self-contained and presupposing only a general knowledge of physics and calculus, this book introduces and develops the methods of vector algebra and calculus as most naturally expressing the concepts of atmospheric processes.

378 pages; 5½ by 8½; $4.50

SCIENTIFIC SOCIETIES IN THE UNITED STATES

By RALPH S. BATES, formerly of the History Department, Massachusetts Institute of Technology

The only book that gives a complete survey of the evolution of American scientific societies during the past two and a half centuries, covering national, state and local organizations. Proceedings, transactions and other publications of hundreds of scientific societies were used in the preparation of this book. The relation of such historical factors as national growth, to the formation of scientific societies, is discussed in the book.

246 pages; 5½ by 8½; $3.50

MAINSPRINGS OF CIVILIZATION

By ELLSWORTH HUNTINGTON, Research Associate in Geography, Yale University

The three parts of this book take up first the general problem of evolution from geological times down to the present, with special emphasis on the stages preparing the way for the development of civilization. Part two deals with heredity, and discusses the selective action of migration, and the problems of race. The final section takes up the effect of physical environment on the evolution of civilization, emphasizing climate, diet, and density of population as basic factors.

660 pages; 5½ by 8½; $4.75

JOHN WILEY & SONS, Inc., 440-4th Ave., New York 16, N. Y.
THE TOTAL ECLIPSE OF THE SUN

Amateurs seeing the total eclipse of the sun on July 9 can help astronomers by paying special attention to the moon’s shadow and the horizon glow. Descriptions of these and an estimate of the general brightness at mid-totality should be sent to Dr. John Q. Stewart, of the Princeton University Observatory.

The sunrise eclipse, which can best be seen from parts of Idaho and Montana, furnishes an opportunity for observations without instruments, such as have not yet been made satisfactorily with a low sun, according to an article by Dr. Stewart in Sky and Telescope.

Illumination during an eclipse seen near sunrise or sunset differs from that when the sun is high overhead in two important ways.

First, the cone of the moon’s shadow, lying nearly horizontal, intersects the earth’s surface near sunrise or sunset in an elongated ellipse instead of in a circle as with a vertical shadow cone. The ellipse is elongated toward and away from the rising or setting sun. Toward and away from the sun the shadow edge is relatively distant and the aspect of the sky will rapidly change as the shadow passes. In the two directions athwart the ellipse the glow will extend high above the horizon and show little or no reddening because the shadow edge there is close at hand.

The second way a sunrise eclipse differs from a noonday eclipse is that at exact sunrise the shadow is not moving horizontally eastward, but is falling through the air. Near the sunrise point the axis of the shadow is moving down from interplanetary space.

To make such observations, local knowledge of the terrain is needed to pick a site where there is an unobstructed view across lower mountains in all directions, and especially toward the rising sun. It would doubtless be necessary to camp the night before near the top of a favorable summit.

The sun rises totally eclipsed at 6:14 A.M., MWT, about 10 miles southeasterly from Cascade, Idaho. Then the shadow passes about eight miles north of Salmon, Idaho, thence five miles south of Butte, Mont., two miles south of Saco in northeastern Montana, and one mile south of Opheim, which is eight miles below the Canadian border. Thus there are a number of places from which such observations may be made.

Because little attention has been paid to the study of the general illumination in an eclipse shadow, a large eclipse shadow was more or less expected to result in an unusually dark eclipse. Thus Dr. Stewart and James Stokley, now with the General Electric Company, were surprised to notice that although the circular shadow of the eclipse of June 8, 1937, which they observed near noon, was nearly 180 miles in diameter, the eclipse became no darker, than in a summer afternoon’s thunderstorm.

This year Dr. Stewart and Mr. Stokley, who observed the other eclipse from a freighter in the Pacific Ocean, plan to pay particular attention to the shadow, probably seeing it from the top of some mountain in Montana. Dr. Stewart is anxious for amateur astronomers to send him a report of their findings on the eclipse.

“Advance rehearsals are a necessity! The eclipse will not reoccur,” Dr. Stewart warns those interested in making the observations. “Inspect the proposed site of your station and use your imagination to suggest all possible preparations.

“Record the weather conditions which prevail during the eclipse. State types of clouds, if identified. Note the color of the sky around the sun. State the distance at which hills and the like can be seen, as an indication of the purity of the air. Even if there is a high overcast the shadow may be apparent on the clouds.

“Be continuously on the alert for unexpected phenomena, and write everything down immediately after totality.”

ITEMS

The Azerbaijan Academy of Sciences at Baku, the oil center, has been added to the roster of the world’s scientific bodies. Geologists, physicists, biologists and other scientists and technologists are now at work exploring the raw materials and working out new methods and processes for the industries and agriculture of this republic of the U.S.S.R. which lies on the eastern side of the Caucasian Mountains. Chromite, the ore of chromium needed for steel alloying, as well as ores of cobalt, barium and aluminum have been discovered. Cotton yields have been increased. The autonomous academy replaces a branch of the U.S.S.R. Academy, and the new organization starts with fifteen academicians under the presidency of Dr. M. Markazimov.

American Aviation reports that after July 1 weather maps for aviation will be the same all over the world, when the United States Weather Bureau replaces the presently used constant-level charts with constant-pressure upper-air charts as a basis for its domestic aero weather forecasts. The constant-pressure charts were developed through the combined efforts of the Army, Navy and Weather Bureau for world-wide combat and transport operations. Since the armed forces are using the constant-pressure charts, the Weather Bureau decided to adopt this type of chart for domestic forecast, in the belief that it will coordinate the continuity of weather maps over the world and increase the efficiency of upper air analysis. The domestic airlines, through the Meteorological Committee of the Air Transport Association, have opposed the move on the basis that airline operations in this country are accustomed to the use of the current type of chart. Therefore, the Weather Bureau will continue to report the constant-level types of charts on its teletype system for spot weather reporting until next year. This should give the airlines sufficient time to become adapted to the new method.
Standard Macmillan Texts

FOUNDATIONS OF BIOLOGY
By L. L. Woodruff

"I know of no better text for fundamentals, for a cultural education, or as a stimulus for more study in the biological sciences."—W. R. Hunt in The Yale Journal of Biology and Medicine.

"Thoroughly recommended to all students and to all general readers."—Isis. 6th Ed.—$3.75

MANUAL OF BIOLOGY by G. A. Baitsell—designed especially as a companion volume to Woodruff’s Foundations of Biology but can be used with any other standard text in biology. 6th Ed.—$2.75

A TEXTBOOK OF GENERAL BOTANY
By Smith, Gilbert, Evans, Duggar, Bryan and Allen

"Can be highly recommended to be used in a one semester or a year’s course in general botany."—Bios. "Can be recommended with confidence."—Jl. of the N. Y. Botanical Garden. 4th Ed.—$4.00

BACTERIOLOGY
By Buchanan and Buchanan

"The authors have selected with great discrimination and have succeeded in gleaning from a wealth of material a well-balanced and well-organized text."—Practical Home Economics. 4th Ed.—$3.75

COLLEGE ZOOLOGY
By R. W. Hegner

Well known as the outstanding text in its field this general survey for students who will not take advanced work is here happily combined with detailed instruction sufficient for those who will. 5th Ed.—$3.75

LABORATORY DIRECTIONS IN COLLEGE ZOOLOGY
by H. L. Bruner—corresponds with Hegner's College Zoology but is sufficiently detailed and comprehensive for use with standard texts other than Hegner’s. 3rd Ed.—$1.75

LABORATORY EXPLORATIONS IN GENERAL ZOOLOGY
By K. A. Stiles

"Laboratory Explorations in General Zoology is new, dynamic, adaptable, and thorough. It is good scientifically and pedagogically... The author does not merely talk about the scientific method he really teaches it. It is not to be supposed nothing else is taught but the scientific method. The subject matter of the exercises includes well-chosen material from animal morphology, physiology, taxonomy, ecology, embryology, heredity, and evolution—all arranged to relate to man."—Bios. $2.50

The Macmillan Company, 60 Fifth Avenue, New York 11
TECHNICAL TITLES IN THE NEWS

INFRARED AND RAMAN SPECTRA OF POLYATOMIC MOLECULES. By Gerhard Herzberg.
This book explains how studies of Raman and infrared spectra have yielded definite information about molecular structure. This specific knowledge includes the rotational and vibrational energy levels of molecules, the forces which hold the atoms to their equilibrium position and the frequencies with which they oscillate, and the geometric arrangement of the atoms in the molecule, their internuclear distances and other fundamental facts of equal importance. At every point the fundamental principles are clearly explained, and all the important data, including molecular constants, is presented in tables for convenient reference.
650 Pages Cloth 6 x 9 Illustrated $9.50

A timely book which explains with admirable clarity the intricacies of U.H.F. Radio—so valuable in this war and certain to play a mighty part in peace time. Already television, amateur radio bands, inter-train communication networks and a new feature called citizens’ radio, are scheduled by the latest F.C.C. regulations to occupy the ultra-high frequencies. Covers in detail the magnetron oscillator, the Klystron, transmission lines at the U.H.F., wave guides, cavity resonators, U.H.F. antennas, U.H.F. measurements and wave propagation. A complete, understandable self-study manual on U.H.F. Radio.
242 Pages Cloth 5¼ x 8¼ Illustrated $3.25

THE NEW PLASTICS. By H. R. Simonds and M. H. Bigelow, assisted by J. V. Sherman.
The first complete book on the great wartime developments in plastics, just published, with government permission. Answers every question about the physical, thermal, mechanical, chemical, electrical and molding properties of the new plastics. Complete chapters on the new fibers, organic coatings and adhesives, the new laminating materials, plywood and synthetic rubbers. Covers in detail the composition, manufacture and fabrication, business facts and significance of the new plastics and synthetics, both those in tonnage production and those in the experimental stage.
312 Pages Cloth 5¾ x 8¼ Illustrated $4.50

THEORETICAL CHEMISTRY. By Samuel Glasstone.
From the three great subjects of quantum mechanics, statistical mechanics, and molecular spectra, this book selects and develops those topics that are most important to the chemist, and that require a previous mathematical knowledge only of elementary calculus and simple differential equations. These topics include the electron theory of valence, concept of resonance, electronic configuration of molecules, calculation of thermo-dynamic functions from spectroscopic data, dissociation accompanying light absorption, valence force constants, bond distances, intermolecular formulas and other important matters.
515 Pages Cloth 6½ x 9¼ Illustrated $5.00

ENGINEERING MATHEMATICS. By Harry Sohon.
This text has been planned in every detail for use in courses taken by students after they have finished the usual work in calculus. It is designed to supplement the students training in mathematics by giving him methods needed in engineering, including such topics as determinants, dimensional analysis, complex numbers and hyperbolic functions, algebraic equations, Fourier series, differential equations, gamma functions, and Bessel’s functions, vector algebra and vector calculus.
278 Pages Cloth 6 x 9 Illustrated $3.50

In its scientific accuracy and its interesting style, this book reflects the author’s wide experience as an engineer and author. Here he explains the various types of electronic equipment in their applications in communications, in science and in industry. He includes the more recent work with high-frequency oscillating circuits, which have produced sharp-edged beams of short range, opening many more channels for telephony, broadcasting and television.
178 Pages Cloth 5¾ x 8¼ Illustrated $2.25

D. VAN NOSTRAND COMPANY, Inc.
250 4th Avenue New York 3, N. Y.
Wertheim's New, 2nd Edition

Textbook of Organic Chemistry
By E. WERTHEIM, PH.D.
Professor of Organic Chemistry, University of Arkansas

Many new teaching devices included

"It is clear, direct, and contains a sufficient amount of the human element to make it interesting to the student"—says a teacher. The author has kept in mind the fact that students depend on the text for much of their instruction, therefore every effort has been made to meet and improve this situation. It is easy to learn the facts from this textbook and it is easy to find them again when wanted.

113 Illus.
Color Inserts
867 Pages
$4.00
May 1945

Excellent teaching devices are included among which are new and stimulating review questions, numerical problems and up-to-the-minute literature references. These will facilitate student reports and class discussions in courses which allow this treatment.

Teachers will like the colored plates of molecular models of organic substances, the tables of derivations of organic compounds, the flow sheets of industrial processes, the numerous charts, summaries, chronological table and the glossary. All are time-saving, helpful features that will allow the instructor more time in organizing the work. A full year's course for beginners, students majoring in chemistry or specializing in organic chemistry and for premedical and chemical engineering students.


The experiments illustrate important properties, methods of preparation and reactions of organic compounds. The wide variety of experiments offered makes selection possible. Each procedure is carefully and accurately described and a number of helpful drawings are included. Time tables accompany each experiment. A section on "spot tests" is included.
McGraw-Hill Books for Fall Classes.

TEXTBOOK OF HEALTHFUL LIVING. *New third edition*
By Harold S. Diehl, M.D., Professor of Preventive Medicine and Dean of the Medical Sciences, University of Minnesota. 708 pages, 5½ x 8¼. $2.50

The author of this well known practical guide to healthful living has again revised the text to include recent developments in the fields of nutrition, vitamins, physical fitness, immunity, the military control of insect-borne diseases, etc. All statistics have been brought up to date. New material has been added on mental health, heredity, narcotics, drug addiction, care of the skin, and medical services.

GENERAL ZOOLOGY
By Tracy I. Storer, Professor of Zoology, University of California at Davis. *McGraw-Hill Publications in the Zoological Sciences.* 798 pages, 5½ x 8¼, 551 illustrations, 5 colored plates. $3.75

This highly successful standard text, generally regarded as one of the best now available, represents an introduction to zoology designed for a "types" course. The book provides both a general biological approach and a systematic review, in order to give the student a rational understanding of the structure, function, and life characteristics of animals, as well as an orderly knowledge of animal types.

LABORATORY MANUAL FOR GENERAL ZOOLOGY

Designed to accompany the author's General Zoology or similar texts, this manual includes exercises on the structure and physiology of the frog, others on the general principles of animal biology, and a series of common representatives of the chief groups of animals from amoeba to amphioxus. A booklet, *Suggestions for Laboratory Instructors,* will be furnished gratis to users of the Manual.

BIOLOGY: The Science of Life
By Mary Stuart MacDougall, Professor and Head of the Department of Biology, Agnes Scott College. In collaboration with Robert Hegner, late Professor of Protozoology, The Johns Hopkins University. 963 pages, 5½ x 8¼, 555 illustrations. $4.00

Enthusiastically welcomed by teachers everywhere, this immediately successful text tells the story of biology simply yet scientifically, in an adroit combination of the "principles" and "types" course that permits an unusual degree of flexibility. Although emphasis is placed upon zoology, plant biology is included in every general discussion of principles, respiration, excretion, reproduction, etc.

GENERAL CHEMISTRY
By John Arrend Timm, Professor of Chemistry and Director of the School of Science, Simmons College. *International Chemical Series.* 691 pages, 5½ x 8¼, 185 illustrations. $3.75

Off to an excellent start, this distinctive text has won the approval of teachers and reviewers, who praise the clear, graphic presentation and the vivid, readable style. The text is designed for students who plan to use chemistry in their professional education, and is suitable for beginners as well as those who have completed an elementary course in secondary school. One of the distinctive features of the book is the sound modern approach to the fundamental theory.

Send for copies on approval

McGRAW-HILL BOOK COMPANY, Inc.
330 West 42nd Street, New York 18, N. Y.  Aldwych House, London, W.C. 2
Cenco design incorporates many desirable refinements:

1. Flexibility in adjustments results in greater utility.
2. 360° Rotation of head permits experiments above and below rotator.
3. Easy-to-operate speed counter; engaged by slight pressure of finger.
4. Constant speed at any setting, stable because of square-milled thread on the control mechanism.
5. Direction can be reversed without stopping motor.
6. Wide range of speeds.
7. Wool-packed bearings for long-life lubrication.
8. Attachment spindle for holding accessories.
9. Driving disk may be easily disengaged when not in use.

No. 74350A Cenco Friction-Drive, Variable-Speed Rotator provided with electric motor for 115 volts, 60 cycles A.C., measures 15 x 5½ inches and weighs approx. 20 pounds.

Each $50.00

Write for Science Supplies Catalog V-2

CENTRAL SCIENTIFIC COMPANY
Scientific Instruments & Laboratory Apparatus
1700 Irving Park Road, Chicago 13

79 Amherst St., Cambridge 42
In a field hospital, a SURGEON uses a new x-ray machine that marks the exact location of the bullet, speeds life-saving behind the battle line.

... the name on the X-RAY MACHINE is Westinghouse.

In a laboratory an ENGINEER uses the instantaneous power of 75,000 thunderbolts to test giant circuit breakers that protect America’s power systems.

... the name on the CIRCUIT BREAKER is Westinghouse.

In his tent a SOLDIER uses a bug bomb to destroy insect life — safeguarding health and increasing comfort in tropical jungles.

... the name on the BUG BOMB is Westinghouse.

In a war plant a WORKER uses an electromagnetic device to detect flaws in heat-treated bearing races — keeping our combat vehicles rolling on to victory.

... the name on the ELECTROMAGNETIC DEVICE is Westinghouse.

TODAY — Westinghouse products are serving in every battle, on every front, in the war against aggression.

TOMORROW — New processes and new materials... created under the stress of war... will mean better and longer-lasting Westinghouse products for a world at peace.
PERIODICALS

WANTED TO PURCHASE SCIENTIFIC PERIODICALS, FOREIGN—DOMESTIC. WALTER J. JOHNSON, 125 E. 23rd Street, New York 10, New York.

POSITIONS OPEN


Opportunities Available—(a) Assistant or associate professor in biochemistry; should be particularly conversant with gross and applied anatomy; full time; East. (b) Biological photographer; one of the leading hospitals; Midwestern city. (c) Physicist; department of radiology; large teaching hospital; minimum $3600; Middle West. (d) Professor of chemistry; small co-educational college; South. (e) Physiologist; duties consist of research work in the examination and development of physiological properties of new chemical series; would work as part of group with general planning of research though approach and operation as well as responsibility for problems would be individual matters; permanent association; expanding program; laboratories large pharmaceutical company; East; $4000. (f) 5-1 Medical Bureau (Burneice Larson, Director) Palmolive Bldg., Chicago 11, Illinois. Position available for qualified physiologist or Biochemist. Research on amino acids. Eleven-month appointment, $2,200. Department of Physiology, Louisiana State University School of Medicine, New Orleans 13, La.

Mammalian physiologist, young man, Ph.D. or equivalent, half teaching, half research, eastern University. Instructor or assistant professor according to experience. Box 149, "SCIENCE," Smithsonian Institution Bldg., Washington 25, D. C.

School administrators in all the states from Maine to California inclusive are requesting that we recommend teachers to them for their teaching staffs. We are interested in further registration of teachers, both experienced and inexperienced, who have in mind continued advancement in the teaching field. AMERICAN COLLEGE BUREAU 28 E. Jackson Blvd. Chicago 4, Ill.

INSTRUMENTS

For Sale: 1 Leitz Used Large Photomicrographic Apparatus Model "UMA," complete with arclamp, with 40" bellows extension, accessories for photography of general features, without microscope, in good working order. Box 141, "SCIENCE," Smithsonian Institution Building, Washington 25, D. C.

SUPPLIES

Write for New Cat. No. 67 on Analytical Filter Papers


Head Office: 118-119 West 14th St. New York 11, N. Y.

We still have considerable stock of Grubler Stains and Kahlbaum Chemicals. Write for quotations.

ARETOS, INC., 55 Van Dam St., New York 13, N. Y.

INSTRUMENTS

Fluorite and apochromatic objectives, compensating oculars, dark-field condensers, camera lucidas, and other "special items." Write for our list. We repair all makes of microscopes. THE GRAF-APS CO., 5808 Broadway, Chicago 40, Illinois.
"Guts", they call it in men . . . and "guts" goes for machines, too! In rain, mud, snow and ice . . . VICTOR can take it. Letters from G. I.'s the world over attest this. One letter specifically states, "Victor is the one projector that can take the beating."

Such performance and stamina isn't just happenstance . . . It's the result of 22 years' experience. Victor started to build "guts" into its 16mm equipment on that day when A. F. Victor produced the first Victor projector and led the way in its practical application for teaching in schools and churches . . . speeding production in Industry and training and entertain the Military. Yes, Victor Equipment is truly 16mm Magic!

*Invest In Victory — Buy More War Bonds*

**VICTOR**

ANIMATOGRAPH CORPORATION

Home Office and Factory: Davenport, Iowa
Chicago (1)—188 W. Randolph

MAKERS OF 16MM EQUIPMENT SINCE 1923
Kodak Plates for

ELECTRON MICROSCOPY

The Kodak plate best suited to electron microscopy, and the one most generally used for this purpose, is the Kodak Medium Lantern Slide Plate. It has high contrast and fine granularity.

For higher contrast and finer granularity, the Eastman Spectroscopic Plate, Type IV-O, has proved quite suitable. For extremely fine granularity and very high resolving power, the Eastman Spectroscopic Plate, Type 548-0, is recommended.

You are invited to write for further information on any problem that may arise in connection with the photographic phases of electron microscopy.

EASTMAN KODAK COMPANY
Research Laboratories
Rochester 4, N. Y.
Visual Training dons olive drab

How to take a fighting plane apart and put it together again—how to "keep 'em flying"—how to combat enemy tactics—how to win this war quickly—is the problem!

Speed in imparting a clear understanding to millions of fighting men—millions of civilian defense workers—is attained best by projection methods. Dramatically, they magnify and project charts, drawings, photographs and detailed close-ups. The student can retain the graphic picture better than the words of the instructor. Seeing becomes knowing how. Knowing how is the answer!

Spencer LENS COMPANY
BUFFALO, NEW YORK
SCIENTIFIC INSTRUMENT DIVISION OF
AMERICAN OPTICAL COMPANY