Fossil of spiny brachiopod (×3) recovered from limestone rock recently brought to the Smithsonian Institution from the Glass Mountains of West Texas (see News and Notes).

Role of Microorganisms in Acid Mine Drainage
Arthur R. Colmer and M. E. Hinkle
NEW PHYSIOLOGY CHARTS
Authoritative
Modern

FUNCTIONAL PHYSIOLOGY
- The Underlying Theme
21 Charts on Physiology edited by Dr. A. J. Carlson, Professor Emeritus Department of Physiology, University of Chicago
9 Health, Hygiene, Safety and First-Aid Charts by Eminent Specialists in each particular field
30 UP-TO-DATE CHARTS— LARGE SIZE 29 x 42 inches
SELF-TEACHING ECONOMICAL NON-TECHNICAL COLOR DIFFERENTIATION MAKES CLEAR BODY PROCESSES EMPHASIZES IMPORTANT FACTS

In addition a 128-PAGE TEACHERS' MANUAL written in non-technical language to aid the teacher in presenting the IMPORTANT FACTS OF PHYSIOLOGY AND HEALTH, is included. It gives 65 biographical sketches of those who have made great contributions to the progress of medicine and includes a bibliography of 125 sources for teachers' aids. 80 EXPERIMENTS to be performed by the Teacher or Student are also OUTLINED.

No. 17 Vision of Set No. 7050
No. 7050. PHYSIOLOGY CHARTS Set of 30 in Charthead with tripod. Per Set... $37.50
No. 7050A. PHYSIOLOGY CHARTS Set of 30 in Charthead but provided with wall bracket mounting. Per Set... $37.50
No. 7050B. PHYSIOLOGY CHARTS Set of 30 in Charthead with a heavy, circular, metal base support. Per Set... $42.50

Write for Circular.
Another outstanding example of quality teaching materials at a low price.

W. M. WELCH SCIENTIFIC COMPANY
Established 1880
1515 Sedgwick St., Dept. E Chicago 10, Ill., U. S. A.
Manufacturers of Scientific Instruments and Laboratory Apparatus
WEATHERWAX' Plant Biology

Beautifully illustrated — finely balanced — and thoroughly up-to-date ... the New (2nd) Edition of Dr. Weatherwax' text is all of these. It is ideally suited for today's one-semester course in elementary botany. All through the text you will find new material that has been added for this edition. An entirely new discussion of auxins is given—with their relation to tropisms, flowering, etc. There is new material on viruses, penicillin and streptomycin. And a new section appears on Plant Formation—covering the four major groupings: forests, grasslands, deserts and tundras.

By Paul Weatherwax, Professor of Botany, Indiana University. 451 pages, with 380 illustrations on 190 figures.

PALMQUIST and PETRY'S
General Botany Laboratory Book

This important new laboratory manual is designed for courses with 30-36 laboratory periods of approximately two hours each. It is unusual in its complete directions for the student; in the thoroughness of its question-and-answer approach to each problem; and in the usefulness of its illustrations. The experiments cover a wide variety of subjects from diffusion and osmosis to digestion and respiration. The practicality of the manual is evidenced by its adaptability to any standard text and by the availability of the plant materials it requires.

By Edward M. Palmquist, Ph.D., Professor of Botany, University of Missouri; and Loren C. Petry, Ph.D., Professor of Botany, Cornell University. 190 pages, illus. $2.25

W. B. SAUNDERS COMPANY
West Washington Square Philadelphia 5
CONTENTS

The Role of Microorganisms in Acid Mine Drainage: A Preliminary Report:
Arthur R. Colmer and M. E. Hinkle 253
Reconnaissance Soil Survey Work in Japan: C. L. W. Swanson ........ 256
News and Notes ....................... 259
Comments by Readers ................. 265
Technical Papers
Relative Sensitivity of Dormant and Germinating Seeds to 2,4-D:
John W. Mitchell and James W. Brown .............. 266
Inactivation of Certain Neurotropic Viruses in Vitro
by Serum Lipids: J. Casals and Peter K. Olitsky ...... 267
The Abundance of Thallium in the Earth's Crust:
L. H. Ahrens ................................ 268
Reaction of Certain Plant Growth Regulators With Ion Exchangers: Robert J. Weaver ...... 268
Granulosa Cell Tumors in Intrapancreatic Ovarian Grafts in Castrated Mice:
Min Hsin Li and W. U. Gardner ............. 270
Differential Phytotoxicity of Metabolic By-Products of
Helmintosporium victoriae:
Frances Mechen and H. C. Murphy ............ 270

Application of "Metabolite Antagonism" to Cancer Research:
David M. Greenberg and Martin P. Schulman ..... 271

In the Laboratory
A Slide Rule for Determining Chicken Red Cell Agglutination Titer: M. C. Davies .......... 273
Olive Oil as a Solvent for Certain Organic Vapors: R. Macy and B. Gehauf .............. 274
New Rectal Culture Tube: Joseph Felsen .......... 275
Comparison of Hematocrit Methods: Paul L. McLain ... 275
The Halogen-Metal Interconversion Reaction and Its Application to the Synthesis of Nicotinic Acid Labeled With Isotopic Carbon: Arthur Murray III,
W. W. Foreman, and Wright Langham ............. 277
Analytical Determination of Basic Groups in Amino Acids and Proteins: D. P. Cretie .......... 277

Book Reviews
Fundamental chemistry: an elementary textbook for college classes. (2nd ed.): Horace G. Deming. Reviewed by THERALD MOELLER ............. 278
Glacial geology and the Pleistocene epoch:
Richard Foster Flint. Reviewed by Francis D. Hole .......... 278

Science, a weekly journal, is published each Friday by the American Association for the Advancement of Science at Mt. Royal & Guilford Avenue, Baltimore 2, Maryland. Founded in 1880, it has been since 1900 the official publication of the AAAS. Editorial, Advertising, and Circulation Offices, 1515 Massachusetts Avenue, N.W., Washington 5, D. C. Telephone, EXecutive 6000 or 6001. Cable address SCIMAG, Washington, D. C. Entered as second-class matter January 17, 1947, at the postoffice at Baltimore, Maryland, under the act of March 3, 1879.

Articles offered for publication should be sent to the Editor, 1515 Massachusetts Avenue, N.W., Washington 5, D. C. Membership correspondence for the AAAS should be sent to the Administrative Secretary, 1515 Massachusetts Avenue, N.W., Washington 5, D. C.

Annual subscription, $7.50; single copies, $.35; foreign postage (outside the Pan-American Union), $1.00 extra; Canadian postage, $.80 extra.

Remittances and orders for subscriptions and single copies, and notices of changes of address should be sent to the Circulation Department. 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 file.

Change of address. Four weeks notice is required for change of address. 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.
FROM GRAMMAR SCHOOL through COLLEGE

...Here's help for America's future scientists

Teaching Aids
Free and low-cost materials to stimulate interest in science, including: authoritative and up-to-date booklets, charts, motion pictures, slide films, transcriptions and posters designed especially for Junior and Senior High School use.

Scholarships
Sixty-one regular scholarship awards are made each year by Westinghouse and the Westinghouse Educational Foundation to High School Seniors with exceptional scientific talent, engineering aptitude and leadership ability.

College Service
Westinghouse provides many types of aids for use in college classrooms including technical material, charts and engineering problems.

Graduate Study
Thirty-seven graduate scholarships and fellowships are maintained by the Company and the Foundation in the fields of science, engineering and business. These fellowships are open to college students throughout the country.

Under the Westinghouse graduate study programs, Westinghouse employees can participate in advanced courses leading to a Masters or Ph.D. Degree at six universities.

Graduate Training
The Westinghouse graduate student training course, which has trained more than 14,000 college graduates in its fifty years of operation, helps bridge the gap between college and industry. Trains men for careers in research, engineering, sales and manufacturing.

Westinghouse

For catalogues describing these activities and materials, write Westinghouse Electric Corporation, School Service, P. O. Box 1017, Pittsburgh, Pa.
THE "MULTI-RAY" LABORATORY LAMP

With four different interchangeable light sources

This versatile multi-purpose outfit consists of an operating unit and four interchangeable 12-inch tubular lamps. The operating unit comprises two principal elements—a base with switch and an adjustable reflector with universal lampholders. The four lamps provide

- Short-wave ultraviolet for disinfection.
- Long-wave ultraviolet for fluorescence, titration, photography, etc.
- White light for illuminating instruments.
- North skylight for color comparisons.

Lamps are readily interchangeable and all operate directly from 115 volts, 60 cycle. The current consumed is negligible, being less than 15 watts.

No. 26220—MULTI-RAY LABORATORY LAMP. Complete unit with standard set of four lamps with cord and plug for operation from 105–125 volts, 60 cycles A.C. .......................................................... $32.00

Complete descriptive literature available on request.

WILL CORPORATION

ROCHESTER 3, N. Y. • NEW YORK 12, N. Y.
BUFFALO APPARATUS CORP., BUFFALO 5, N. Y.
SOUTHERN SCIENTIFIC COMPANY, INC., ATLANTA 3, GA.
you know
your tissues
will spread
e-v-e-n-l-y

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

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

... it's a

Technicon
constant temperature
water bath
Recent Publications in Chemistry

BASIC COLLEGE CHEMISTRY 1946 701 pages 147 figures $3.75
by Joseph A. Babor, College of the City of New York

Representative Comments: "The most suitable text I have encountered. Best features are clarity of exposition, sample problems worked in text, and answers furnished to problems at chapter end."

... "It has the approach I've always looked for: from atomic structure and Periodic Table."

... "The new arrangement provides for a clearer and simpler introduction to an application of the structure of matter."

... "A fine teachable organization. Should make general chemistry a more coherent course for students."

... "I like its directness of approach to basic principles, its clearness of statement, its lucid explanations and its wealth of student self-helps designed to be of real help."

FIRST-YEAR QUALITATIVE ANALYSIS 1947 134 pages $1.25
by Carl J. Likes, Hampden-Sydney College, and Aubrey E. Harvey, Jr., University of Louisville

A brief text on the freshman level but designed for a fairly complete study of both cations and anions, judged from experimental and theoretical standpoints. The material has been carefully graded and organized to anticipate many of the problems first-year students encounter in a tradition-ally second-year subject. Considerable emphasis has been placed on equilibrium calculations to show how the principles of equilibrium and ionization can be employed to effect a systematic separation of ions in solution.

EXERCISES IN ORGANIC SYNTHESIS 1947 60 pages $.75
Jacob G. Sharefkin, Brooklyn College

... "Excellent as a supplement to the standard textbook. Very worthwhile to the student as a review and to the instructor as a plan for presenting interesting problems."

... "Practical examples for the student show the usefulness of certain reactions."

... "Fills a definite vacancy in the teaching of a course in elementary organic chemistry."

SEMIMICRO QUALITATIVE ORGANIC ANALYSIS 1947 498 pages 67 figures $3.75
by Nicholas D. Cheronis, Chicago City College (Wright Branch), and John B. Entrikin, Centenary College

A combination text and manual for students of qualitative organic analysis as well as for indus-trial chemists and laboratory workers in chemistry and related fields. The text includes one hundred pages of tables giving the physical constants of organic compounds and their derivatives. It emphasizes reliable procedures and includes all necessary techniques for the identification of organic compounds. As these techniques and procedures are based on semimicro quantities, their use in general organic analysis will effect a substantial reduction in the cost of chemicals.

PHYSICAL CHEMISTRY 1947 610 pages 215 figures $4.75
by Herschel Hunt, Purdue University

Representative First Impressions: "I like the mathematical formulation of the physical chem-istry concepts and the fine group of problems that accompanies each chapter."

... "Presents a lot of worthwhile ideas which are not ordinarily found in an elementary text. The early introduction of thermodynamics and the full use of mathematics are good features."

... "The arrangement of chapters as almost independent units makes it a very flexible book, adaptable to various needs. The practical applications of physical chemistry seem to be especially fine."

... "Chart of symbols at beginning of each chapter an excellent addition."

THOMAS Y. CROWELL COMPANY

432 Fourth Avenue New York 16, N. Y.
"During the years that hot pressed plywood was being introduced, and our company was pioneering in resin adhesives, one of my interesting assignments was to give informal talks and demonstrations. These talks were before trade associations, technical societies, forestry schools, universities, architectural forums, designers' conferences, industrial institutes, etc. On all these occasions a Carver Laboratory Press was my dramatic assistant and little squares of Tego bonded plywood were made on the spot and handed out "hot" to the audience. My press has traveled many thousand miles all over the United States, and it has never failed to give its convincing evidence to the audience."

(signed) Thomas D. Perry, Development Engineer

THE RESINOUS PRODUCTS & CHEMICAL CO.

STANDARD FOR RESEARCH AND DEVELOPMENT

The Carver Laboratory Press is in constant use by plastics engineers, chemists and laboratory technicians for development, research and instruction work; testing single cavity molds, preparation of samples, etc. The Carver Press is a complete, self-contained hydraulic unit. Accurately controlled pressures to 20,000 lbs.; 6-inch gauge is rigidly mounted on base. Carver Standard Accessories include Electric or Steam Hot Plates, Carver Test Cylinders, Swivel Bearing Plates, Cage Equipment. Available from stock. Write for catalog.

FRED S. CARVER INC.
HYDRAULIC EQUIPMENT
341 HUDSON ST. NEW YORK 14, N. Y.
Through New Design and New Precision

The amazing lightness of the Bausch & Lomb Zephyr-Light Binocular is not a result of merely changing from an aluminum to a magnesium body. It was achieved through new optical and mechanical redesign, and new precision methods.

In the optical system, which comprises nearly 40% of the total weight, lenses and prisms are reduced to their minimum thickness and weight by maintaining closer working tolerances. High image quality is not only retained, but the Balcote anti-reflection lens coating increases light transmission, and sharpens image contrast. All mechanical parts, such as objective and prism mountings, eyepiece parts, and body are lighter because of use of magnesium alloy and re-design permitted by greater precision.

An entirely new experience in binocular comfort, convenience, and pleasure is yours when you use the postwar Bausch & Lomb Zephyr-Light Binocular. At your dealer's now. Bausch & Lomb Optical Co., 642-F St. Paul Street, Rochester 2, New York.
William E. Wickenden, 64, president of Case Institute of Technology since 1929, died of a heart attack at his summer home in Jaffrey, New Hampshire, on August 31, the day of his retirement from the presidency.

Shuichi Kusaka, 31, assistant professor of physics, Princeton University, was drowned at Beach Haven, New Jersey, on August 31.

Rudolf W. Glaser, 59, entomologist and zoologist who for the past 27 years had been associated with the Rockefeller Institute for Medical Research, died on September 4 in Princeton, New Jersey.

John Herr Musser, 64, professor of medicine at Tulane University since 1925, died September 5 in New Orleans.

Robert G. Green, 52, professor of bacteriology, University of Minnesota, since 1929, died September 6 at his home in Minneapolis.

Frank O. Ellenwood, 68, John Edson Sweet professor of engineering, Cornell University, and an authority on steam-power plants, died in Strong Memorial Hospital, Rochester, New York, on September 7.

James S. Plant, 57, director of the Essex County Juvenile Clinic, Newark, New Jersey, since 1923, died September 7 at his home in South Orange, New Jersey, following a heart attack.

Rear-Admiral James C. Pryor, 76, onetime head, Department of Hygiene, Naval Medical School, and professor of preventive medicine, George Washington University, died September 8 in the Naval Hospital, Brooklyn, after a long illness.

Magel C. Wilder, 49, assistant professor of biology, Brown University, died September 8 at her summer home in Hamilton, Rhode Island.

Soup fin sharks and ling cod will provide the raw materials for a new vitamin-concentrating plant now being built for Vitamin Sales Corporation of South Africa at Simonstown, about 23 miles from Cape Town. Oil from the livers of these fish contains high concentrations of Vitamin A. The technique called the Solexol Process, developed by the M. W. Kellogg Company, chemical engineers of New York, will be employed. By this processing technique over 90 per cent of the original Vitamin A and D content of a crude fish oil is recovered in the concentrate. In its location close to abundant raw materials, its use of this process, and with a ready market for its various products, the Solexol vitamin unit, first of its kind in the world, is expected to set a pattern for future marine oil processing plants.

The fall campaign of the New York University-Bellevue Medical Center Fund will be officially inaugurated at a dinner on September 30 at the Waldorf-Astoria Hotel to be attended by over 1,500 leaders in medicine and industry. The principal speaker will be Frank W. Abrams, chairman of the Board, Standard Oil Company of New Jersey. In a discussion of "Medicine's New Role in Industry" Harry Woodburn Chase, chancellor, New York University, Robert Kehoe, director, Kettering Laboratory, Cincinnati, and Howard A. Rusk, chairman of the University's Department of Rehabilitation, will complete the list of speakers.

Statcin Caronamide, a new drug inhibiting the renal tubular excretion of penicillin and elevating the concentration of penicillin in plasma from two to seven times, has been reported in the August issue of The American Journal of Medicine. The clinical tests were conducted at the Pennsylvania Hospital, Philadelphia, by Christopher C. Shaw, William P. Boger, and J. William Crosson, Medical Research Division, Sharp & Dohme, Inc., and Walter W. Kemp, William S. M. Ling, and Garfield G. Duncan, Department of Medicine, The Pennsylvania Hospital. The results of the work have indicated that the most satisfactory administration of the new drug is by mouth every three hours. The Statcin-penicillin therapy is expected to be of greatest value in combating subacute bacterial endocarditis and osteomyelitis.

The National Bureau of Standards has established a new Division of Building Technology, the nucleus of which consists of the following sections: structural engineering; fire protection; heating, ventilating, and air-conditioning; exterior and interior coverings; and codes and specifications. Research will be limited to physics, chemistry, and engineering. Much of the work to be carried on will be primarily for the benefit of other governmental agencies, although the results should be useful to the entire construction industry and it is intended that they shall be made available for this purpose.

Acta Chemica Scandinavica, a new journal in the field of chemistry, has been inaugurated by a group of Scandinavian scientists to further research done in the various Scandinavian countries and as a means of presenting new ideas and results to colleagues all over the world. The Acta aims thus also at a true international exchange of scientific information in the field of chemistry. All papers in the journal will be written in English, French, or German, and by Scandinavian scientists or others working in Scandinavian laboratories. It will appear 10 times per year, with a yearly volume totaling about 1,200 pages. Subscription rate is $8.50 plus postage. Orders should be addressed to Einar Munksgaard, Næregade 6, Copenhagen, Denmark.

According to an announcement by Science Service, a second famous Harvard telescope has arrived in Torun, Poland, to become the chief instrument of the new observatory at the birthplace of Nicholas Copernicus. The 8-inch Draper telescope, which provided spectrograms of 100,000 northern stars for the late Annie Jump Cannon's 10-volume Draper catalogue of spectral classes, positions, and brightness, has been especially rehabilitated and equipped for a Polish program of research on star colors, temperatures, and chemical compositions.

Make Plans for—

American Institute of Electrical Engineers, Middle Eastern District Meeting, September 23-25, Dayton, Ohio.

American Public Health Association, October 6-10, Atlantic City, New Jersey.

American Academy of Ophthalmology and Otolaryngology, October 12-17, Chicago.

Society of Rheology, October 30-31, New York City.

American Association for the Advancement of Science, 114th Meeting, December 26-31, Chicago, Illinois.