

ing of the "seeds" of *Nyssa aquatica*, it, like *Taxodium*, can not come in on an area kept constantly flooded.

IVAN V. SHUNK

N. C. STATE COLLEGE OF THE
UNIVERSITY OF NORTH CAROLINA

ON "A NEW COLOR REACTION FOR VITAMIN B₁ (THIAMIN, ANEURIN)"

VILLELA and Leal¹ report that pure synthetic Vitamin B₁ produces an intense blue color by the use of ammonium molybdate in sulfuric acid solution and aminonaphthosulfonic acid solution, and prescribe the quantitative method of Fiske and Subbarow, which is primarily used for phosphorus determinations.

The author was interested to ascertain if the blue color would be produced likewise when using stannous chloride as the reducing agent instead of aminonaphthosulfonic acid. Both reagents are used in phosphorus determinations by the blue color methods, and if thiamin interfered in one or both, it should be taken into account. Also since there is a distinct need for an efficient thiamin method, reports should be considered and evaluated.

By employing the stannous chloride reduction method,² it has now been found that thiamin (Vitamin B₁ Hydrochlor. Cryst. Merck) gives no blue color. Neither does thiamin give any blue by the Fiske and Subbarow method. Presumably, Villela and Leal³ used thiamin chloride or hydrochloride, since no report of the isolation of the pure base has yet been made. However, by first treating thiamin chloride hydrochloride with NaOH (to produce the strong base),⁴ neutralizing and immediately following with

the procedure prescribed by Villela and Leal, no blue resulted. Reagents and procedure were, of course, thoroughly checked.

It is concluded that thiamin, or Vitamin B₁, does not give a blue color by the Fiske and Subbarow method nor by the stannous chloride reduction method. Thus thiamin does not interfere in phosphorus determinations. It is suggested that the blue color indicated by Villela and Leal was probably due to impurities.

GUY E. YOUNGBURG

UNIVERSITY OF BUFFALO MEDICAL SCHOOL

CHRONICA BOTANICA

COMMUNICATIONS from Dr. Fr. Verdoorn in November convey the information that the difficulties arising from the war situation in Europe which threatened the existence of *Chronica Botanica* have been solved.¹ It is announced that this important periodical will be published as a weekly beginning January, 1940, with the number of pages increased to 850 annually, with about 150 illustrations. Publications of all planned volumes of the "New Series of Plant Science Books," including numbers by Lloyd and Reed and H. I. Baldwin, together with the production of Volume 1, "Tree Growth" by MacDougal, will be carried out. The editor advises that urgent letters be sent by air mail and that all other mail be designated via "Holland America Line."

D. T. MACDOUGAL

F. E. LLOYD

H. S. REED

DECEMBER 5, 1939

SCIENTIFIC BOOKS

PHYSICS

Physical Science in Modern Life. By E. G. RICHARDSON. 256 pp. 16 plates. D. Van Nostrand Company, Inc. \$3.00. The English Universities Press, Ltd. 8/6d.

THE publisher's blurb on the jacket is: "If you have wondered how an aeroplane flies—what constitutes a quicksand—why it is usually necessary to shake an embrocation, but not a mayonnaise—how a man can glide for four hours in an engineless aircraft—what limits clarity on a television screen and power in broadcasting stations—how a fish swims—whether we shall ever have trips to the moon—here is the book for you."

Certainly there can not be too many works that

¹ Gilberto G. Villela and Aluiso M. Leal, *SCIENCE*, 90: 179, 1939.

² Guy E. Youngburg and Mamie V. Youngburg, *Jour. Lab. Clin. Med.*, 16: 158, 1930.

excite wonder or clarify the problems born in wonderment. The author claims to have set his back to the atom and the molecule and to have faced those recent advances which make contact with everyday existence. Perhaps his incentive came from his aunt, who was fond of lauding the advances in psychic science at the expense of those in the material world. When she asked him what physics had done for her, he replied that the tram had brought her up the hill that day. Thus he says the book might be called "tramway physics."

Perhaps beginning students and others do display glassy eyes when the conversationalist or lecturer begins by mentioning atoms, molecules, electrons, neu-

³ It is to be noted that Villela and Leal use twice as much Molybdate II as Fiske and Subbarow. It made no difference, however, in this application.

⁴ R. R. Williams, *Ind. Eng. Chem.*, 29: 980, 1937.

¹ Robert F. Griggs, *SCIENCE*, 90: 4418, November 3, 1939.

trons, cosmic rays, etc. Possibly it is wise to disarm the 'aunties' by promising them that words or ideas that hurt or produce drowsiness will not be used. It is certainly a worthy objective, to fill the great human void of understanding about the physical world without using logic or ideas against which many people are mentally allergic. There are millions who love birds but know them only by sight, sound and habitat. It seems reasonable that millions should have a vibrant alertness for the discernment of natural phenomena commensurate with the alertness of the man in the grand stand waiting for a home run.

Mechanics is covered in the chapter "Streams and Eddies," with the idea that motion is a more attractive starting point than statics. No equations are given and the reader may not even discern that mathematics was necessary in the formulation of the knowledge. Generally the ideas are developed using the word "particle" instead of "molecule," but in a few places he uses "molecule" without apology.

In the subject of heat, molecules are mentioned, but it seems to the reviewer it would have been better to have recognized heat as molecular energy. It would have been easier to explain the hot wire anemometer and the hot wire vacuum gauge. In this connection it would have fitted the objective to have explained the dark streaks on the plastered ceiling of the usual farm house or the patches of dust collection on the plastered wall back of the radiators.

Physicists and mathematicians generally should read this book, partly to learn facts, but more especially to appreciate how good an understanding of the subject can be given without using equations and formulae. The author's presentations and scope, with trifling exceptions, are sound. Recently an editor desired to correct a writing to read that an ellipse was a flattened circle. There is not an instance where the author has been guilty of describing an "ellipse as a flattened circle."

Without decrying the need for physicists capable of super-mathematical analysis, one can not help feeling the need of more physicists who can reach out to the other men of common clay and thereby bring greater benefits to all. In general, such men will use formulae and complicated analysis for personal achievement rather than to dazzle and daze the audience.

F. C. BROWN

MUSEUM OF SCIENCE AND INDUSTRY,
CHICAGO

Demonstration Experiments in Physics. By RICHARD MANLIFFE SUTTON. viii + 545 pp. New York: McGraw-Hill Book Company. 1938. \$4.50.

THIS is a compilation of lecture demonstrations in physics originated by the American Association of Physics Teachers, as suggested by Professor C. J.

Lapp. Upon recommendation of a committee composed of Professors John Zeleny, C. T. Knipp and H. W. Farwell, the editor was appointed in 1935. More than 200 members of the association contributed.

The work is designated as a "cook-book" for teachers of physics to illustrate the principles of physics in a manner to develop a fascination and an understanding of the physical world about us. A "cook-book" is rarely read by others than cooks. The designation is rather modest, for this book should be used wherever there is need or latent desire to understand the simple elements of the physical world.

In general, the demonstrations are simple and require the minimum equipment for performance and are well designed to clarify fundamental principles rather than to daze the student or "show off" the instructor. There is, however, full recognition of the incentive for a student to think if he is amazed or intrigued. Thus brilliant brass trimmings are not specified, as garnishings may be recommended in a "cook-book." It is pointed out that every mathematical formulation of a principle can be translated into an experiment and that the skilful teacher will constantly resort to simple demonstrations to emphasize the relationships involved.

Most of the 1,200 demonstrations described are familiar to the experienced instructor. Nevertheless, every one will find unfamiliar and delightful new ones. For example, the "Falling Chimney—Free-Fall Paradox" was new to the reviewer. In this a ball is rested on the upper end of a meter bar, pivoted at an angle of 30° . A paper cup is attached to the meter bar 15 cm from the upper end of the bar. When the meter bar is released, the ball falls in the cup. This shows that the upper end of a pivoted bar travels faster than a freely falling body. This was recently shown to two most eminent teachers to whom it was new, both as to the principle and technique involved. Many demonstrations of this character are included. The reviewer would have welcomed two others in similar category—one is the free fall of a calling card, with edges turned up, in a stairwell. In this case the card falls with amazing steadiness perpendicular to direction of motion. The other is the "Roberval Enigma" involving the same explanation in balances as in M-41 (a).

The reviewer would praise this compilation of demonstrations by expressing the wish that two companion volumes might be published. One, "Automatic Demonstrations in Physics," would comprise descriptions with diagrams and illustrations that would be useful in the construction of equipment designed for students and others to operate, view and study without the necessity of an attendant instructor. Such demonstrations, like books in a library, would be available for study and pleasure at least forty hours a week instead of a meager ten minutes that might be possible

in a class period. The art of construction of such demonstrations is an extension of the automatic principles developed for manufacture and merchandizing.

The other desirable volume might be called "Showing off the Physical World." The demonstrations in this book should be designed for stage production for the fascination and education of the general public. In

this connection one thinks of such performances as given by the Bell Telephone Laboratories, the General Electric Company, the Westinghouse Electric and Manufacturing Company and the General Motors Corporation.

F. C. BROWN

CHICAGO, ILLINOIS

REPORTS

GRANTS OF THE AMERICAN PHILOSOPHICAL SOCIETY

THE following grants in the natural and exact sciences were awarded by the committee on research of the American Philosophical Society in December, 1938, and in April, June and October, 1939. Grants in renewal of previous grants are not included, as these have already been published in SCIENCE.

Reginald D. Manwell, Syracuse University, for experimental animals in connection with the study of the exoerythrocyte cycle in avian malaria, and its relation to the development of immunity; the study to be centered about *Plasmodium circumflexum*. \$300.

John Ernst Weaver, University of Nebraska, for technical assistance, travel in connection with studies on the damage done by drought, the adjustment of grassland to these injuries, and the method and rate by which prairie is being reestablished. \$450.

University Museum, University of Pennsylvania, for excavations at Piedras Negras, Guatemala. \$3,000.

Simon Freed, University of Chicago, for part payment of a research assistant in the study of the symmetries of the electrical fields about ions in solution and their relation to chemical thermodynamics. \$750.

Francis Harper, John Bartram Association, for the preparation for publication, with annotations, of John Bartram's manuscript diary of his journey through the Carolinas, Georgia and Florida in 1765-66; of William Bartram's manuscript report to Dr. John Fothergill on his travels in the Carolinas, Georgia and Florida in 1773-74; and of a new edition of William Bartram's "Travels" (1791). \$1,000.

H. H. Hess, Princeton University, and M. Ewing, Lehigh University, for traveling expenses in the continuation of a gravity survey of the Caribbean area and the correlation of the gravity field with the geologic structure. \$1,000.

J. Percy Moore and Olin Nelsen, University of Pennsylvania, for the purchase of a micro-manipulator with a warm chamber to be used in connection with experimental studies on the free uterine eggs and blastocysts of the opossum to test the existence of embryonic organizers and the mutual interrelation of parts and related problems. \$300.

Harvey Harlow Nininger, American Meteorite Laboratory, for field work in the search for and laboratory investigations of meteorites. \$500.

Emil W. Haury, University of Arizona, for a part of the

expenses of the excavation of a prehistoric village on Forestdale Creek, Fort Apache Indian Reservation, Arizona, occupying the area of direct contact between the Mogollon and Anasazi cultures. \$500.

Research Council on Problems of Alcohol, for technical assistance, chemicals, animals and apparatus, to be used in connection with the study of the toxic factors in alcoholism. \$1,500.

L. S. Cressman, University of Oregon, for field work in connection with the archeological exploration and excavation in southeastern Oregon. \$600.

Samuel King Allison, University of Chicago, for part payment of a research assistant in making a precise measurement of the energies of short-range particles produced in nuclear disintegrations. \$500.

James A. Shannon, New York University, for part payment for technical assistance in the study of the relationship between the renal tubular reabsorption of water and the role of the antidiuretic principle of the posterior pituitary; the effect of the composition of the body fluids upon the latter variable. \$600.

Francis Owen Rice, Catholic University of America, for technical assistants in connection with his studies on the synthesis of polynuclear ring systems by a method of thermal polymerization. \$1,000.

Merritt L. Fernald, Harvard University, for traveling expenses for himself and two assistants, equipment, etc., in connection with the collection of plants in eastern Virginia and the Carolinas. \$1,500.

Carl C. Speidel, University of Virginia, for photographic equipment to be used in investigations of the histological changes exhibited by cells and tissues as these are subjected to various experimental procedures, and to record the changes by cinephotomicrography. \$400.

Margaret Lantis, University of California, for travel and other expenses in Alaska involved in making an ethnographic study, through the complete seasonal round of the year, of the Eskimos of Nunivak Island, Alaska, as the culturally best preserved group of the important but little known Alaskan Eskimos south of Bering Strait. \$950.

Robert W. Pennak, University of Colorado, for apparatus to be used in making a study of the comparative limnology of north central Colorado. \$350.

Rodney H. True, University of Pennsylvania, for traveling expenses and assistance in making investigations of materials and personalities of significance alluded to in Thomas Jefferson's manuscript book on his garden operations at Shadwell and Monticello, Va. \$750.

Louis W. Chappell, West Virginia University, for travel-