artificial light for a continued period, immediate fruiting resulted. On examining the fruiting bodies, it was possible to classify the species as *Hemitrichia vesparium*.

A survey of the taxonomic history of *Hemitrichia vesparium* discloses that the color assigned to the plasmodium has been purple-red with no reference to the conspicuous yellow color observed in this study. It is of interest to record this color observation, since the recent monographs of Lister (1925) and Martin and Macbride (1934) assign a shade of red or purple to the plasmodium, evidently in accordance with the descriptions of the earlier workers. Whether the early descriptions of the form are inadequate as to the color status of the plasmodium or whether the plasmodium under certain physiological conditions assumes a purple-red, while under others a bright yellow color, are interesting questions. However, it appears from previous observations that plasmodia in relation to species are distinctly constant in color aspect.

LLOYD G. CARR

UNIVERSITY OF VIRGINIA

LITERATURE SERVICE FOR CHEMISTS

BEGINNING on October 1 the Hooker Scientific Library, Fayette, Missouri, inaugurated a new literature service for chemists. Dr. Julian F. Smith is leaving the du Pont Company, where he has been doing chemical literature work, to become associate director of the "Friends of the Hooker Scientific Library," of which Dr. Neil E. Gordon is director.

Through Dr. Smith the library will offer translations and literature searches, backed by facilities for providing filmstat or photostat copies of any matter in the more than twenty thousand volumes comprising the collection. To his chemical education (B.S., Illinois 1916; M.S., California 1920; Ph.D., Chicago 1922) and his long experience in chemical literature work Dr. Smith adds linguistic skill acquired by years of practice in translating from German, French, Spanish, Italian, Portuguese, Dutch, Scandinavian, Polish and Russian.

The combination of a specialist in technical literature and one of the most comprehensive chemical libraries ever assembled is unique in chemical reference service. It offers an unprecedented opportunity to all chemists to have technical literature or patents clearly and accurately translated by a chemist, and to have the literature on any problem skilfully combed by an experienced searcher who is not hampered by language barriers.

The Hooker Scientific Library will render these services at cost (on a self-supporting but not a profit basis) to members of the "Friends of the Hooker Scientific Library." The minimum fee for an individual life membership is $10; for a permanent corporation or institutional membership, $100. All who are interested are invited to write to Dr. Neil E. Gordon, Central College, Fayette, Missouri.

NEIL E. GORDON

CENTRAL COLLEGE,
FAYETTE, MO.

SCIENTIFIC BOOKS

RECENT BOTANICAL BOOKS

Protein Metabolism in the Plant. By ALBERT C. CHIBNALL. xv + 306 pp. 21 figs. 9 plates. Yale University Press, New Haven. 1939. $4.00.

THE Silliman Memorial Lectures in Yale University for 1938 are here presented in an expanded form. It is fortunate that our knowledge of the physiological chemistry of the proteins in plants should be summarized for the benefit of plant physiologists and biochemists by one whose researches have led him far into the field. Drawing from his own extensive experience and from a wealth of historical and present-day literature, Professor Chibnall has succeeded in presenting a thought-provoking account of the problems and the progress of this field of plant science. The first three chapters are devoted almost entirely to a historical survey of many of the earlier contributions to the protein metabolism in seedlings from the point of view of their relationships to contemporary protein chemistry. Since they include commentaries upon the works of many of the original investigators of the natural amino acids, these chapters should be of additional interest to all present-day students of biochemistry. The classical studies of Pfeffer, Schulze and Prianischnikow receive special consideration and are interpreted in the light of more recent knowledge. One chapter discusses the formation of asparagine and glutamine in seedlings, with emphasis upon the origin of the ammonia and of the carbon precursors. Another deals with the mechanism of amino acid and protein synthesis in plants, and stresses the rôle of the α-keto acids. The preparation of proteins from leaf tissues and the application of the author's own methods to extensive studies of the composition and nutritive value of the proteins of forage plants are described at some length. Three chapters explore the protein metabolism of leaves and the rôle of proteins in the respiration of detached leaves. Evidence for the existence of a protein cycle in leaves is critically discussed, and the interrelationships between organic acids, carbohydrates and fats and proteins in leaf respiration are considered.

The contents of these three chapters are of particular importance in the sense that major developments in plant physiology seem to be here foreshadowed. The final chapter is concerned with the regulation of protein metabolism in leaves. The factors which determine when and to what extent proteins are synthesized and decomposed during the various stages of development of the plant are discussed in so far as present knowledge permits. Three appendices present valuable data on the hydrolysis and constituent analysis of leaf protein preparations.

The lectures represent the author's interpretations of a very large number of uncoordinated researches in an especially difficult field of investigation. Nevertheless, they present as a unit the most extensive and stimulating commentary yet available on the state of our knowledge of the metabolism of amino acids, amides and proteins in the green plant.

R. F. DAWSON

COLUMBIA UNIVERSITY

Elements of Plant Pathology. By IRVING E. MELHUS and GEORGE C. KENT. vii + 493 pp. 259 figs. The Macmillan Company, New York. 1939. $4.00.

THIS book is designed for an elementary course of one quarter or semester for students training for various aspects of agriculture. The authors have placed emphasis on phenomena of parasitism and principles of disease control and have condensed or omitted mycological and morphological considerations. Citations to literature are omitted, save for a list of books on or directly relating to plant pathology; and references to individual investigators are usually restricted to instances of classical contributions.

The first 113 pages deal with general aspects or principles, including chapters on plant pathology and human affairs, development of plant pathology, disease in plants, parasitism, the influence of environment on plant diseases and principles of control measures. The following 336 pages are devoted to specific parasitic diseases, grouped according to the systematic relations of the pathogens. Non-parasitic diseases are treated in 14 pages. A glossary of 7 pages follows.

The authors have made an excellent selection of material and presented it clearly and forcefully. The chapter on plant pathology and human affairs strikes at the outset a note of vitality that is maintained throughout the book. The reader with imagination is constantly reminded of the important contributions of plant pathology in the struggle of the race for an adequate physical basis to support its life and culture. The sharp restriction of the mycological, morphological and bibliographical treatment will be regarded by some as a disadvantage. Furthermore, the mode of treatment that the authors have chosen sometimes implies a finality that they would scarcely wish to maintain in a more advanced course. If these are disadvantages, they are largely imposed by the plan of treatment, which was thoughtfully developed by the authors in the light of their extensive teaching experience in both plant pathology and general botany.

The book is excellently printed and illustrated and will be welcomed as a valuable contribution to elementary teaching of plant pathology.

G. W. KEITT

UNIVERSITY OF WISCONSIN

The World of Plant Life. By CLARENCE J. HYLANDER. xxii + 722 pp. 249 figs. 195 plates. The Macmillan Company, New York. 1939. $7.50.

THE author has attempted a somewhat unusual work, a synoptical survey of the plant kingdom for popular consumption. The first 121 pages are devoted to an account of the groups usually included under the Thallophyta (here divided into 7 phyla), together with chapters on the Bryophytes and Pteridophytes. The bulk of the book consists of an enumeration of the larger families of flowering plants, arranged in an order which includes some rather puzzling departures from any current systems of classification. The plants dealt with include the more outstanding, curious, interesting and economically important forms, not only of the United States but of the world. Particular emphasis is laid upon food and ornamental plants, their origin and use. The magnitude of the work may be appreciated by the fact that the check list of species mentioned in the text includes nearly 2,000 scientific names. The numerous and on the whole excellent illustrations will aid materially in the recognition of many of these forms.

The author states that the book is planned primarily for the layman, and secondarily for college students who have had some introduction to the field of botany, for the semi-professionals such as gardeners and members of horticultural societies and for specialists in some small field of botany. Certain chapters should indeed appeal to the layman; among these is the introductory chapter, which deals with such topics as the nature of plants, a comparison of plants with animals, physiology, reproduction, classification, the significance of plant life to mankind, and the chapters on plant epiphytes, saprophytes and parasites, the orchids, the cacti, carnivorous plants and the beverage plants. While the book may appeal to one who has already had considerable experience and contact with plant life, and therefore constitutes a welcome addition to the shelves of plant-minded people, it is not, in the opinion of the reviewer, a book for the general reader. It is too bulky and too technical, and its encyclopedic account of the families of angiosperms belongs rather in a work of reference than in the type of book likely to be favored by one unacquainted with plant life.

Any attempt to popularize a subject is certain to bring forth criticisms of over-simplification from professional workers in the field. The book in general is not open to such criticisms, although it may be hoped that the term "breathing pores" as applied to stomates may eventually disappear even from popular literature. Here and there careless statements and minor errors occur, together with confusion and mislabeling in connection with the illustrations. Perhaps there are no more errors than might be expected in a volume of this size.

The author writes well, with many a happy turn of phrase, and demonstrates that he has mastered many of the aspects of presenting scientific subject-matter to the public, but his zeal and industry have caused him to fall short of his main purpose in this case.

C. L. WILSON

DARTMOUTH COLLEGE

ANNUAL REVIEW OF PHYSIOLOGY

Annual Review of Physiology. JAMES MURRAY LUCK, Editor. VICTOR E. HALL, associate editor. American Physiological Society and Annual Reviews, Inc., Stanford University P. O., California, 1939. Pp. 705. $5.00.

THE first volume of Annual Review of Physiology—a sister publication to the well-established Annual Review of Biochemistry—comes as a welcome addition to the field of scientific publications. It is the only attempt to present in the English language a survey of contemporaneous work in physiological sciences, and the only publication in any language which accomplishes the task well, in concise and inexpensive form. This, of course, is largely due to the enthusiastic and conscientious efforts of the various contributors, each an authority in the field covered.

It is impossible to give a synopsis of a volume such as this, but mention of a few items selected at random may be allowed. Needham's review of Developmental Physiology calls attention to the importance of bringing embryology into the physiological field. The development of form depends on metabolic changes, and further understanding of embryological changes will be more and more determined by a better understanding of the energetics of cell growth and differentiation and of the chemical and physical excitants concerned. Burton's review of Temperature Regulation is characterized by explicit emphasis on the most significant lines of advance, *e.g.*, the evidence dealing with the more exact localization of the heat-regulating center in the hypothalamus and the highly discriminating power of peripheral temperature receptors. The extensive work of Winton, DuBois, Burton and their associates on ultimate factors concerned in heat loss, and their relation to clinical fevers, climatic adaptation, air conditioning, etc., are all reviewed. Murlin, in a section devoted to Energy Metabolism, gathers together in an authoritative way much new work relating to such old subjects as normal standards of basal metabolism, the importance of racial and hormonal factors, etc.

Bazett reviews the Peripheral Circulation, devoting considerable space to the subject of aortic elasticity. The control of the peripheral circulation by nervous and local metabolites has received renewed attention during the year that has passed, but one wishes it were possible to sift the material more critically. Some overlapping of subject-matter, with a subsequent chapter by Eyster on Heart occurs, a difficulty that will perhaps always exist in the artificial subdivision assigned to reviewers. Eyster's review includes new work on the course of impulses in the heart, electrocardiography, vectorcardiograms, etc. Limitation of space has prevented the expansion of subjects that the reviewer would have liked to see.

Gesell offers a charming review of Respiration, but is too inclined to fit all work into his own mold of thought. Bozler gives a good review of Muscle, and Ivy and Gray of the Digestive System. Newer work seems to relieve the gastric sphincter somewhat of its age-long function of guarding the pyloric gate, and nerves seem to have a subsidiary responsibility for secretion of bile. The reviewers properly stress the difficulty of drawing conclusions from experiments in which nerves are sectioned or stimulated, for, in control of secretion and motility, separate fibers rather than whole nerve trunks are undoubtedly activated. Mann and Bollman edit the complementary chapter which surveys the multifold functions of the liver. Hope is renewed that the moot problem of the fatty liver may soon be completely solved as a result of the application of experimental methods. It emphasizes the need of doing something more than looking at tissues through a brass tube with pieces of glass at its ends.

The contributions that have been made by means of action potentials in our understanding of the activity of nerve, spinal cord and brain are authentically analyzed by Bronk and Brink, Jr., Eccles and H. Davis, respectively. Hinsey reviews the work on the autonomic nervous system in his usual conservative manner, giving particular attention to the importance of the afferent pathways. The new work on posterior root afferents is included.

Homer Smith reviews the newest developments in renal secretion and calls attention to the possible intrarenal regulating mechanism for the control of blood flow, to the possibility of extraglomerular blood supply to the tubules, and to the action of the posterior pituitary and adrenal cortex on renal function.

Applied physiology is reviewed by Dill. This is restricted to such fields as muscular exercise, high tem-