SCIENTIFIC BOOKS

PLANT GEOGRAPHY

Foundations of Plant Geography. By STANLEY A. CAIN. xiv + 556 pp. New York: Harper and Brothers. 1944. Price, $5.00.

ONE of the great difficulties in present-day science is to get the immense amount of fact, deduction and theory concerning a specific subject into sufficiently compact form so that the interested individual can at least get some idea of the whole picture. This Dr. Cain has done for dynamic plant geography—a geography mainly concerned with how and why a plant got where it is rather than just where it is. This book is in no sense a conventional plant geography. Habitats, ecological or geographical, of plant groups of almost any size or kind, are given scant attention. In Dr. Cain's own words, the book is "an effort to survey the related fields of science for concepts and working methods which are useful in an interpretation of the phenomena of plant distribution. Many of the materials are from the fields of paleontology, taxonomy, evolution, genetics and cytology. I have sought to cut the hedgerows between these fields of science, and to discover, for myself at least, some of the significance which one field has for another."

In cutting the hedgerows, Dr. Cain has organized his material into thirty chapters, each in most cases epitomized in italics at the start, followed by discussion and factual illustration, often ending with the author's criticism for or against. These chapters are grouped into five parts: introduction, paleoecology, areography, evolution and plant geography, significance of polyploidy in plant geography. There is a very much needed glossary, since the terminology used in some cases reminds one of certain English-language novels full of French-language expressions. One might be critical here, for the author, figuratively speaking, does not always call a spade a spade, but refers to it as a geotome.

There is a "Literature Cited" list of 720 titles, mostly of recent vintage, covering many biological fields. Among the striking omissions are references to R. E. Cleland's work on *Oenothera* and to the works of Charles Elton on the importance of population size as an evolutionary factor. There is an excellent index.

In reviewing a work of this type, there is a great temptation to discuss many of the chapters, especially those involving subject-matter with which the reviewer is most familiar, but space restrains him. Among the most interesting chapters are "Certain Aspects of the History of Cenozoic Vegetation of Western America," "Species Senescence," "Causes of Species Stability," and "Rate of Evolution and Speciation." All the chapters are thought-provoking, written for those who question and not for those who just swallow. The language is technical and, outside of outline maps and diagrams, there are no illustrations.

The author in dealing with polyploidy, diploidy and haploidy is apparently unaware of the use of n and $2n$ in speaking of haploids and diploids in the generation sense. He suggests the use of g for gametophytic or haploid and S for sporophytic or diploid individuals.

The title of the book, for many people, would be misleading; it is primarily a book on evolution, to be classed alongside Julian Huxley's "Evolution; the Modern Synthesis," and it ought to be of great interest to any one properly backgrounded who is seriously concerned with the broad problems of evolution.

ORLAND E. WHITE
THE BLANDY EXPERIMENTAL FARM,
UNIVERSITY OF VIRGINIA,
BOYCE & CHARLOTTESVILLE, VIRGINIA

ELECTROTHERAPY

Technic of Electrotherapy. By STAFFORD L. OSBORNE and HAROLD J. HOLMQUEST. C. C Thomas, Springfield, Illinois, 1944. Price $7.50.

ELECTROTHERAPEUTIC measures, like many procedures employed in the practice of physical medicine, can be used successfully only when intelligently prescribed and appropriately applied. Unhappily, the practice of physical medicine has sometimes fallen short of its great potential because it has been applied empirically without basic knowledge of physics and physiology. Fortunately, physical medicine is now attracting the interests and activities of men who bring to it a background of training and experience in physical sciences and physiology. This book provides an excellent example of this development. The book represents collaborative efforts of two experienced investigators and teachers in the fields of applied physics and applied physiology. Both authors have had considerable experience in the special field of electrotherapy, having conducted courses for a number of years at Northwestern University Medical School.

According to the authors, their book is regarded as a supplementary text for students of physical medicine. This limitation to a supplementary role represents a modest appraisal for a book which is sufficiently comprehensive to be described as a reference manual on the principles as well as the techniques of

electrotherapy. It is addressed to the widely varied interests of technicians, medical students and physicians. It meets the several requirements of these groups by providing sound physical and physiologic rationale for electrotherapeutic measures in terms which are neither too profound for the less experienced nor too elementary for the more experienced groups. This difficult matter has been accomplished in part by a division of text. For students who are well grounded in science and who desire comprehensive information regarding fundamentals of electrotherapy, some physical and mathematical data are presented in footnotes. For the students who are less well grounded in science and who desire more streamlined information, the general text, illustrated with a minimum of mathematical formula, is fully satisfactory.

Although bound in one volume, the material has been so arranged that it actually provides four books in one. Major divisions are devoted to the effects and technical application of direct current, electrical muscle stimulation and radiation and high frequency current. Each of these sections is developed with a fixed pattern and with sufficient detail to stand alone. Each division includes a description of theoretical as well as instrumental aspects of electrical phenomena. In many instances, illustrative experiments are described. The influence of each type of electrical energy on man is also indicated by detailed experiments. Comprehensive pictorial and textual descriptions of apparatus currently used in practice are presented. Descriptions of clinical conditions amenable to electrotherapeutic measures are presented in terms of physiological effects induced.

The book is profusely illustrated with diagrams and photographs. The diagrams are well chosen and informative. In contrast, some of the illustrations of apparatus have not been so critically selected and reproduced. These apparent faults are partly due to the use of plates borrowed from previous publications and to failure in eliminating material that is repetitive or unnecessary. In these respects, the book suffers from the minor faults which are common in first editions. None of these detracts from the inherent worth of the book as a whole. There is some lack of uniformity in the style of illustrations, but this may be justified at present as a measure of economy.

The presentation of precise data on the changes in physiology induced by physical agents fills a long-felt need in physical medicine. The summaries of such data appearing in this book set a standard which might well be followed in other branches of physical medicine.

"The Technic of Electrotherapy" can be commended to all groups of students of physical medicine, including technicians and physicians. That technicians should be familiar with the principles of the underlying procedures which they apply is widely appreciated. It is equally evident that the results of prescriptions for electrotherapeutic measures are more successful when written by physicians who are familiar with the physical nature and physiologic influence in the procedures recommended. It is therefore to be hoped that the book will find its way into the hands of the general practitioner as well as into the hands of the specialist in physical medicine. This contribution to the literature of physical medicine provides a significant step toward the establishment of physical medicine in its proper place among medical specialties.

RALPH PEMBERTON
UNIVERSITY OF PENNSYLVANIA

REPORTS

PROGRAM OF THE INSTITUTE OF RADIO ENGINEERS

THE Institute of Radio Engineers, representing the leading radio engineers, is fostering an extensive program for aiding postwar activities. SCIENCE has received the following report in regard to the plans of the institute:

The most remarkable aspects of the growth of the radio industry have been not only its impact upon activities in many other fields, but on the great number of new industries that have been created from the developments of its engineers. The scope of some of these have been so far afield from that which is usually considered to be "radio" that a general term has become popular to describe these miscellaneous applications of radio principles—"electronics." It is interesting to note the scope of this work, as set forth on the cover of the *Proceedings* of the Institute of Radio Engineers: "Radio communication, sound broadcasting, television, marine and aerial guidance, engineering education, power and manufacturing, applications of radio-and-electronic technique, industrial electronic control and processes, tubes, electron optics, medical electrical research and applications, radio-frequency measurements, sound and picture electrical recording and reproduction."

Many of these fields became prominent before the war. However, the trend to electronic methods utilizing war-born developments will revolutionize many other industries and start new ones previously unknown.

The factor which will have a great influence in get-