
Foundations of Plant Geography

In an effort to discover for himself, at least, what some of the fields of science contribute to interpretive plant geography, Professor Cain has attempted to evaluate the materials, concepts and principles of paleontology, taxonomy, evolution, genetics and cytology. The end result of the survey is a volume which he has called "Foundations of Plant Geography"—a title implying rather more than the book contains.

With this observation, however, it must be immediately remarked that what Cain found out for himself is of interest to and constitutes necessary study for, both informed teachers of ecology (plant and animal) and serious advanced students alike. The factual materials in this volume are presented with a studied broadness of view and an apparent thoroughness of examination of the subjects included, and the discussions are supplemented with such an abundance of examples illustrating many concepts and principles, that few will read the book without much profit. Probably only those who are as conversant as the author with the large literature of the several fields treated (among whom the reviewer is not one) can appreciate the difficulties encountered in bringing these materials to their present state of integration, or critically review the work with respect to many of its details.

The volume is presented in five parts, the first of which consists of a brief discussion of the inter-relations of the specialized plant sciences and their importance to interpretive plant geography. Certain previously-stated principles of ecology are reviewed, examined, and illustrated with examples from the literature. Part II deals with paleoecology as a tool of the plant geographer, with a rather full discussion of its limitations, the identification of fossils, and their use in the determination of composition, dominance, living conditions, migrations and evolution of vegetation. The chapter on pollen analysis is especially clear and complete.

Dispersal, migration endemics, endemism, species senescence, discontinuous distribution, vicarious forms and areas, polytopy and polyphylesis, as well as center of origin and criteria for indicating center of origin, make up some of the topics discussed under the subject of Aerography. Part IV is an assemblage of "some of the conclusions regarding relations between evolutionary processes and their results and plant geography." Part V is a discussion of the significance of polyploidy in plant geography. The latter three sections are in part, more philosophical and illustrative examples are sometimes wanting.

The book is something more than a compilation of principles and examples. It is an attempted synthesis, based in general on the Clementsian school of thought, despite the author's renunciation of the Neo-Lamarckian views of Clements; and despite his warning that the organismal nature of vegetation is open to question, assumptions discarded by many ecologists years ago. To the fields of physiology, physiography, pedology and climatology, the author gives no special treatment, although utilizing certain principles of each. For many, these too, form a part of the foundations of plant geography. While most of the material included seems fundamental and pertinent, one curious tendency should be mentioned. It is with hope and expectation of something concrete that one approaches certain discussions such as the chapter on species senescence, only to be impressed with the futility of the whole treatment by the author's closing remark: "Other explanations can be found that have a factual basis and do not have an anthropomorphic taint." A similar impression is gained from the classification of plant propagules on the basis of their migration "adaptations." After much grandiose terminology and the listing of obvious advantages, the discussion is concluded with the statement: "On the other hand, *Carex*, with no particular means of dispersal, is distributed all over the world."

To this reviewer at least, the absence of any special treatment of microclimates, barriers and certain physiological aspects of the subject, is conspicuous, although the author does plead "lack of space" to those specialists who might decry omissions.

Throughout the volume the author has eased the reader's approach to new topics with a statement of principles, which he proceedes to examine, discuss and illustrate. About 100 maps, tables and charts emphasize and clarify certain data and concepts. A bibliography of 720 titles is included.

The diversity of the specialized sciences that make up the foundation of plant geography, their many inter-relations, their overlapping viewpoints, and the difficulty of obtaining complete field data in ecological study, are adequately indicated. With a need for a lucid presentation of the relations among these anastomosing disciplines and methods—with such a need for this pioneer job in particular—it is regrettable that so much of the terminology is unnecessary, and some pedantic. Nevertheless, it is a much-needed, useful and stimulating work—*John N. Wolfe.*

Foundations of Plant Geography, by Stanley A. Cain. Harper and Brothers, New York. 1944. $5.00.