

CURRENT LITERATURE

BOOK REVIEWS

Plant succession

CLEMENTS has brought together in a satisfactory way and in sumptuous form the contributions of all previous workers dealing with the phenomena of succession in vegetation.¹ The work of the various students of succession is conscientiously and sympathetically presented, and with great fulness. So admirably is this work done that it will henceforth be largely unnecessary to refer to original publications, prior to the appearance of this work, in order to get the substantial views of the various authors. The work is thus a compendium of our knowledge and theories bearing on the phenomena of succession. In the field covered by this work, CLEMENTS is himself a major contributor, and in no previous work has he contributed so much new material on the subject as this work includes. No more can be attempted here than to touch a few of the high spots.

As previously, CLEMENTS treats the formation as an organism, with structures and functions like an individual plant. As compared with previous studies by the same author, greater stress is placed on development and less on habitat. To the reviewer this seems a distinct step forward, although many workers, especially in Europe, will continue to emphasize habitat as the controlling factor in classification. The formation is defined as "the climax community of a natural area in which the essential climatic relations are similar or identical." Thus CLEMENTS' formation, as here presented, departs materially from the concept of the Brussels Congress, but agrees essentially with the "climax formation" of the reviewer, and with the still earlier "climatic formation" of SCHIMPER. SCHIMPER, however, probably failed to recognize that his "climatic formation" was really the topmost member of a series of his "edaphic formations." A number of new terms of classical origin are introduced in this volume, as is the wont of the author. Perhaps the most important of these is "sere," a term used to include the entire successional series leading up to the climax. This term is used, rather than its essential equivalent "series," because of its adaptability in combination, as in xerosere (a xerarch series), etc. CLEMENTS' treatment of the term "climax" is in general harmony with the often expressed interpretation of the reviewer; "the climatic formation is the real climax of the successional

¹ CLEMENTS, F. E., *Plant succession; an analysis of the development of vegetation*. pp. xiii+512. *pls.* 436. *figs.* 51. Carnegie Institution. Washington. 1916.

development." An apparent climax, short of the true regional climax, is termed a subclimax.

The chapter in which the views of the author and the reviewer clash most sharply is the one on direction of development. CLEMENTS states positively that "succession is inherently and inevitably progressive." The reviewer is as positive in his opinion as ever that succession may be retrogressive as well as progressive, although of course progression is much more abundant and important. What the reviewer would term retrogression is for the most part by CLEMENTS termed denudation, preparatory to the initiation of another successional series. This might pass, if all such denudations or retrogressions were sudden, resulting at once in the development of a habitat initial to a progressive series. In an area that is gradually sinking, there may be a gradual retrogression from a climax mesophytic forest to a hydrophytic association, with no denudation of any sort whatever. In a review of CLEMENTS' work by TANSLEY,² it is shown that it would be very difficult to apply to England the idea that succession is always progressive.

Chapters follow on the classification of "seres," the climax formations of North America, past climates and climaxes, and past succession. The chapters on past climates and vegetation will be of great value, because they bring together compactly results from widely scattered sources. The theories and the applications of the author's views to the past seem very tenuous. It is difficult enough to apply ecological principles to the vegetation of the present, and it is very much too soon to work out the characteristics and successions of past floras in any but the most superficial manner.

The work is a notable one, and must be on the working table of every ecologist and plant geographer. It is unfortunate, however, that the author has allowed his splendid classical training and love for Greek and Latin to carry him so far afield. The tendency nowadays is toward increasing emphasis on the vernacular, and it is to be feared that many of the author's best thoughts and most inspiring ideas will remain hidden among words.—HENRY C. COWLES.

Botany of the living plant

BOWER³ has put into book form his course of lectures on elementary botany given at the University of Glasgow for more than 30 years. He gives a vivid picture of the plant as a living, growing, self-nourishing, self-adapting creature.

Of the 32 chapters, 18 are devoted exclusively to angiosperms, whose complete life activity is exhaustively treated from seed "germination" to seed dispersal. In the one chapter devoted to gymnosperms only the Scots pine is treated. This seems to the reviewer to be very inadequate treatment

² TANSLEY, A. G., The development of vegetation. *Jour. Ecol.* 4:198-204. 1916.

³ BOWER, F. O., *Botany of the living plant*. 8vo, pp. x+580. *figs.* 447. Macmillan Co. 1919.