Review

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Source: *The Geographical Journal*, Vol. 37, No. 5 (May, 1911), pp. 557-558

Published by: geographicalj

Stable URL: <http://www.jstor.org/stable/1778286>

Accessed: 10-05-2016 18:33 UTC

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AMERICA.

THE PLANT LIFE OF MARYLAND.

'The Plant Life of Maryland.' By Forrest Shreve, M. A. Chrysler, Frederick H. Blodgett, and F. W. Besley. Illustrated by numerous photographs and maps. Pp. 533. Forming vol. 3 of the 'Maryland Weather Service.' Baltimore: Johns Hopkins Press. 1910.

The authors of the book under review aimed at presenting a picture of the vegetation of Maryland and its distribution. They also intended to discover relations between the natural vegetation and the crop possibilities of definite areas. The book begins with a very clear summary, from the two first volumes of the Weather Service, of the Climatology of the whole area, which is divided into five districts. These are the eastern and western districts of the coastal zone, the lower and upper districts of the midland zone and the mountain zone. If we contrast the conditions of the mountain zone at the Sunnyside station (2500 feet high) and those of the coastal zone, at the Pocomoke station (37 feet), we get the following figures. The mean annual temperature (for eleven years) at the former is 47.1° and at the latter 58° , a difference of 10.9° . The annual mean maximum is 58.6° and 67.2° respectively and the difference 8.6° . The mean annual minimum reads 35.6° and 48.7° , giving 13.1° as the difference. But these figures really only become important when we compare them with the length of the season of the various species, a subject which as Phenology has received but scant attention so far. Of greater importance is really the date of the commencement of spring, which is marked by the last day on which a minimum temperature of 32° is observed. The end of the season is marked by the first day on which this temperature is reached again. Thus at Sunnyside the season extends from May 16 to September 15, and at Pocomoke it extends from April 16 to November 7, 122 days in the one and 205 days in the other case. The temperature is thus seen to have a great influence, but this is not so in the same degree with the rainfall, as the latter is rather more uniformly good over the whole state. After a floristic enumeration of the species found in the various formations, the ecology of the latter is gone into in full detail. This part is perhaps just a little disappointing. The work has been done thoroughly during the short time which has been spent on the ecological survey, but we miss the detailed analysis of the vegetation. We would have liked to see drawings, however diagrammatic, of the way the plants grow together. Especially is this of interest and importance where neighbouring associations pass into one another. The general value of this book would thereby have been much increased. But still it represents a very valuable store of information which will serve as a good starting-point for future workers. We should like to call special attention to the very instructive and clear account of the upland forests of the western shore district of the coastal zone. The succession of the various forest associations has been well worked out. The pine association is the original association and this gradually, in its older age, gives way to one of pine-oak, to be followed only by oak-hickory and, ultimately, probably by maple-gum. The latter may arise directly from the pine association. In the lowlands, the succession is from pine through gum-pine to oak-gum. A useful word is introduced by the authors, namely "topland," which includes the upper level or more or less level part where, in any district, we get a matured type of vegetation, to which the vegetation of the slopes forms only the preliminary stages. Very little good seems to have accrued to the agriculturist from the purely ecological part of this report.

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The red spruce is supposed to be an indication that the soil is good for the growing of buckwheat, and the presence of the Loblolly pine means that cotton can be planted with success. But the authors conclude that very little insight can be gained into the agricultural value of any land by a study of its vegetation, except in a very general way. The more specific the nature of the investigations, the more likely is one to make an error when relying on a study of the vegetation for an indication as to the suitability of the soil for agricultural purposes. We can now obtain any required knowledge of the chemical and physical nature of the soil more directly than by a study of the plants which it supports. The agricultural features of Maryland are discussed, and also the forests and their products. In conclusion, upwards of one hundred pages are devoted to a list of the plants occurring in Maryland, arranged systematically. No detailed reference is made to the groups of the lower cryptogams, although these play such a very important part in the history of the development of every flora. The photographs are good in their way, but it is, we think, a mistake to replace drawings entirely by photographs.

O. V. D.

MATHEMATICAL AND PHYSICAL GEOGRAPHY.

THE GEOGRAPHICAL DISTRIBUTION OF FERNS.

'Die Geographie der Farne.' By H. Christ. Illustrated by numerous photographs and three maps. Pp. 358. Jena: Gustav Fischer. 1910. 12m.

To begin with, this work is divided into two parts. The first deals with the ecology of the ferns; the second gives a detailed account, based on extensive material, of their distribution over the surface of the Earth. Briefly, the ferns are mesothermic hygrophytes. In districts with a rainfall of under 60 centimetres, there is a poor fern flora. Their real development begins with an annual rainfall of 200 centimetres. They love the darkness of the forest, and treeless regions are therefore not extensively overgrown with ferns. Humus is another important edaphic condition which helps to explain their attachment to the forest. No plants reflect so certainly and directly the climatic conditions as the ferns. They are particular in the choice of the localities they inhabit to the smallest details, and this precludes their occurrence in pure formations over large areas. They attain their most luxuriant development in the tropical rain-forest as it is found on the hillsides. Here we get all stages, from the tall hygrophil tree-fern to the small filmy fern, and all the intermediate ferns of the undergrowth, to the climbing liana ferns and the large number of almost xerophil epiphytes. The latter show every adaption to their exposed position high on the tropical tree so as to secure every available trace of food material, at the same time protecting themselves against the force of the tropical rain. True xerophil ferns are found, too, which have left the forest and become exposed to the light, and these naturally become more independent of the rich soil which characterizes the localities of the forest. It is impossible to give here a detailed account of the floristic distribution of the ferns. This naturally follows very closely the prevailing climatic and physical conditions, and ferns differ, in this respect, very little from the Phanerogams. Their main area of development has always been the tropical forest. Hence, in the Tertiary period they went north with the Tertiary forest. With the destruction of the latter by ice they too were destroyed. The reappearance of a temperate northern forest has allowed a number of tropogenous fern genera to travel north. Very few of these ferns can be said to be relics from the Glacial period. The sub-Antarctic ferns, too, are derived from tropical forms. There are no real Antarctic ferns. The whole