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The Plant-Geography of Germany

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THE PLANT-GEOGRAPHY OF GERMANY.

By Roscoe Pound.

In a recently published address Dr. Coulter speaks of a new movement in botany which is sending botanists "to the great laboratory of nature," and replacing collecting trips by biological surveys. "The old-fashioned collection of plants," he says, "will hold no more relation to the new field work than the old geology, with its scattered collection of fossils, holds to the topographic geology of to-day." Geographical botany as it is now understood is comparatively a recent development. Collectors and cataloguers for a long time have been gathering a portion of the bare facts upon which geographical botany must proceed, and the facts of plant-distribution have been more or less ascertained. But the systematic collating and grouping of these facts and the application of biological and physiological facts to them is a matter of the last few years and is still going on. At first localities were catalogued, and collectors were eager to add new and rare stations to those recorded for species; then came statistical comparison of families and genera, especially in relation to altitude and the media of plant-migration. The limits of distribution of species were ascertained, particularly of those which are characteristic and controlling in vegetation. Such work laid the foundations of geographical botany.

But the statistics as to the distribution of families, which have been worked out in one method and another, gave no promise of leading to important results. It was not until biological groups began to be made for the purpose of comparison, and statistics began to be applied to those groups, that such work acquired importance. It is apparent that a mere statement of the number of species of the various natural plant-groups occurring in a certain region tells us very little of the vegetation of that region except in the most general way. A group represented by comparatively few species may yet as far as the occupation of the soil is concerned be dominant and

controlling. To understand the vegetation of a region one must ascertain not only what are its physical, meteorological and geological features, but much more what sorts of plants control its water, meadow, plain, or forest vegetation. Directed towards the latter ends, statistics have a very different meaning. Such work is the aim of the new geographical botany. "When we hear of a district," say Schrœter and Stebler, "that it is covered with extended fields of turf-rush or of brome-grass, that tells us more of the nature of the region than long lists of meteorological data. It also tells us more than the mere occurrence of the species in question of itself"

A notable contribution to this department of the science is Dr. Drude's new work, "Deutschlands Pflanzengeographie," of which the first part appeared in January last. The sub title of the work gives a clue to its purpose. It is stated to be "ein geographisches Charakterbild der Flora von Deutschland." Much has been done in recent years towards such characterization of restricted districts, or for large areas as regards certain kinds of vegetation. But Dr. Drude in giving a complete picture of the vegetation of as large a country as Germany has, in one sense, made an epoch in geographical botany. Such a work demonstrates that the era of preparation is passed. A mere cursory examination of the work serves to convince the reader that the theory and system of plant-geography have been thoroughly worked out, and that henceforth workers will be busied chiefly with their application to other regions rather than with devising new methods.

As has been remarked, in order to be of value, statistics must be based not upon the systematic groups of plants but upon groups founded on biological considerations, so far as they indicate a positive role in the vegetation of the region in question. Such groups are called vegetation-groups. Dr. Drude points out also that the proportions of the number of representatives of the several orders, genera, or other systematic groups are not to be reckoned with the whole flora of a region as represented by a certain number of species, but with the biological plant-community of the region. Accordingly he constructs some thirty-five vegetation-groups for the flora of

Germany. The thoroughness of this may be judged from the fact that he begins with trees and ends with plankton-algæ.

Germany belongs to the Middle-European region which, bounded by the Pyrenees, the Alps, and the Balkan system, stretches along the northwest border of the Russian steppes to the arctic flora which extends over the north of Europe. The region includes also the wooded portions of the Scandinavian countries. Throughout this large region, as regards the distribution of families and genera, the same fundamental character prevails. Carrying the principles of division further, and observing on the one hand lesser influences of climate and physiognomy and on the other the division of the floral-elements into "Genossenschaften," subdivisions, or "Vegetationsregionen" are made. Germany and the neighboring regions of the Alps and Carpathians fall into five such divisions; the region of the north-Atlantic lowlands, the region of the south-Baltic lowlands and uplands, the region of the middle and south German highlands and lower mountain districts, the region of the higher mountain districts and subalpine formations, and the region of the higher mountain formations of the Alps and Carpathians. The region of central France and the west-Pontic region, to which belong the southwestern and southeastern neighbors of Germany respectively, include also isolated spots in Germany itself. Dr. Drude's maps show that the first two regions are continuous in extent. The first includes Holland and North Germany west of the Elbe and the western portion of the Danish peninsula, the second East-Prussia and Pomerania, being bounded roughly by the Oder on the west. Between the Elbe and the Oder is a neutral zone, transitional between the two regions. The whole of middle and south Germany to the Alps constitutes the third region. But along the northern borders of the Alps and here and there throughout south Germany, as for instance the Harz forest, the Thuringian forest, the Black forest, in isolated spots, we find the fourth region, the region of subalpine forests. Along the upper Rhine here and there are localities belonging to the region of central France, and in the southeastern portion are many localities belonging to the west-Pontic region.

But geographical botany today does not stop with the distribution of the wild flora. Cultivated plants, native useful plants, weeds, and the flora of waste places come in for their share of consideration and are treated in turn. The plants whose seeds are mixed with those of cultivated plants and are thus sowed and grown involuntarily are placed in the group of cultivated plants. But a more important group is formed by the species introduced and supported incidentally by the cultivation and occupation of the soil by man. A notable instance of this is a group of "saltpetre plants" due to the use of nitrate fertilizers.

It would become tedious to enumerate the many striking features of the work and the ideas which they suggest. The work is in some sort a summary of geographical botany as it now stands. So much material necessarily takes on a new aspect when brought together and digested, though we have been more or less acquainted with a large part of it in its scattered condition. As part of a whole, each fact seems something new. We may safely predict that a great impetus will be given to this kind of botanical work in regions remote from Germany by Dr. Drude's book, since it presents a practical outline which will not fail to be taken advantage of. Our own country furnishes many excellent opportunities which the various biological and botanical surveys now in progress are already beginning to seize. The example of such a geographico-botanical survey of a large country, on a large scale, will be a great inspiration.

Dr. Drude's book is most interesting reading, and as a compendium of the latest results in a growing and important department, as well as in its more immediate purpose, is of the highest value.