

PLANT SOCIOLOGY

# Sociology of American Plant Life Described

**S**OCIOLOGY of American plant life in prairies, forests and mountains, was described before an audience of European botanists by one of their American colleagues, Prof. H. S. Conard of Grinnell College, who spoke at the meeting of the Sixth International Botanical Congress at Amsterdam.

In America, as everywhere in the world, regional differences in climate, soil and other conditions find expression quite as much in plant communities as they do in the cities and states of human beings. Long grass is as natural to Iowa-Nebraska prairies as are farmers raising corn and hogs. Short grass belongs to Montana and Wyoming quite as inevitably as cattlemen. Beech-maple-hemlock forests are as true a sociological expression of Michigan and northern Ohio as are automobile and tire manufacturers.

But these plant societies are no more completely uniform than are human societies. There are plenty of local and even individual differences within the broad frame of a general regional type. Groves of bur oak are as truly a part of the prairies as are the wider stretches of long grass, and in the Eastern forests one will find plenty of places where the dominating trees give way to such things as white pines or tulip trees.

## Many Unaccountable Strangers

Moreover, there are plenty of "strangers" that get into seemingly unaccountable places. Thus, far up into the prairies you can find such trees as the Kentucky coffee tree, as obvious and outstanding a Southeasterner as a gentleman from the Kentucky hills would be in Cedar Rapids or Omaha. Or, on Hempstead Plain on Long Island, you will find wild grasses, legumes and other plants that are so atmospherically "Western" that you almost expect to see a man with leather chaps and a three-gallon Stetson standing among them.

Such seeming aliens can usually be accounted for if you look acutely enough for causes, Prof. Conard pointed out. The plants from the Southeast that have wandered far out into the prairies have followed the moist, rich, sheltered lands that line the stream courses. Such plants are fairly common in the eastern prairies of Illinois and eastern Iowa; in western Iowa and central Nebraska they become

rare. The "Westerns" that crop up in the East are usually found on extremely porous soil, which permits the heavier rains of the region to drain right through, producing a set of moisture conditions resembling those of the drier prairies or even the plains.

One should not speak of these local "foreign" plant societies as "detached fragments" of East or West, standing like islands in a strange country, Dr. Conard contended. They should be frankly recognized as outliers, as true foreigners, which have kept their own identity but which do not really color the communities into which they have for one reason or another found their way.

## Great Britain's Unique Vegetation

Great Britain presents a peculiar picture to the student of plant life: a relatively limited assortment of plant species, but a wide variety of climatic and soil conditions, Prof. A. S. Watt of Cambridge University explained to his fellow-students at the same session of the Congress.

These circumstances give rise to some rather unique situations, Prof. Watt pointed out. Since there are fewer plant species, there is a tendency for each one to spread out more. In other lands, especially in the botanically rich North American region, keen competition between species holds each one very close to the habitat it can occupy to the very best advantage. In Great Britain, on the contrary, each species tends to be limited only by climatic and soil conditions, rather than by the competition of its fellow-plants.

The great variety of British climate, in a comparatively small area, has brought into close contact species usually thought of as belonging to widely separated regions. In the British Isles plants of Mediterranean affinities rub elbows with almost-Arctic species, and plants that thrive best in damp island climates are found growing close to others that are more characteristic of drier inland countries. The sharp contrast between the soil types of western and eastern parts of the islands tends to accentuate the effects of the climate.

Prof. J. Braun-Blanquet of the University of Montpellier, France, compared the principal vegetational types of north-

western Europe with those of northeastern North America. He found striking resemblances between the two regions, both in the kinds of plants that inhabit them and in the soil types on which the vegetations grow.

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SOIL SCIENCE

## Humus Formation in Soil Influenced by Many Factors

**Y**OUNG plants, cut down and buried in the soil as fertilizer, decay much more quickly than older plants of the same kinds do. This was one of the points discussed in a paper presented before the meeting of the Sixth International Botanical Congress by Dr. Selman A. Waksman of the New Jersey Agricultural Experiment Station.

In the experiments described by Dr. Waksman, a number of plants were cut at different stages of growth and definite amounts allowed to undergo decomposition by microorganisms, under identical conditions. Of the young plants, 73 per cent. of their material was decomposed in 30 days, while it took twice as long as that to decompose only 42 per cent. of the material of older plants.

One of the reasons for the difference in decomposition rate, Dr. Waksman pointed out, is the marked difference in the chemical makeup of older and younger plants. The older plants contain higher proportions of more resistant materials, especially the celluloses and lignins. The latter substances, which are the basis of the "woodiness" of wood, are exceedingly difficult for bacteria, fungi and other microorganisms to digest. Moreover, there is a difference between the lignins of old and young plants; in the younger stages the lignins are chemically "tenderer" and easier to break down.

## Varied Organisms of Decay

Differences in humus formation in the soil are traceable not only to differences in the plant materials that are decomposed but also in the living agents of decay, the bacteria, molds, protozoa and other microscopic forms, as well as the insects, worms and other larger animals that feed on dead wood and leaves, chewing them into more manageable morsels for the smaller creatures.

The relative abundance of these is influenced partly by the nature of the dead plant materials themselves, for some of them like wood, others straw, still others dead leaves; and also by such factors as temperature, moisture, soil ventilation and soil acidity or alkalinity.

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