

THE PHYSIOGRAPHIC AND HORTICULTURAL ECOLOGY OF THE BEVERLY (BLUE ISLAND) RIDGE

BY

ELDRED E. GREEN

Chicago, Illinois

One of the prominent features of the Chicago lake plain is the moraine situated about thirteen miles south-southwest of the mouth of the Chicago River. During the last glacial period this moraine was an island in Lake Chicago. The name Blue Island, which was applied to it by early settlers, was doubtless due to its island-like appearance and not to its geological history.

When a settlement grew up on the moraine the name of the region was applied to it as a matter of course. Later, political subdivisions occurred and the moraine came to contain the towns of Blue Island, Morgan Park, and Beverly Hills. The latter two are now included in the corporate limits of Chicago and are known collectively as the Ridge, Beverly Ridge, or Beverly Hills district. Inasmuch as the Beverly Ridge district is closely confined to the actual moraine, and as it includes over two-thirds of the total length of the hill development, it seems better to substitute the term Beverly Ridge at the present time for that of the now less descriptive one of Blue Island.

The Beverly Ridge includes the actual moraine, the sand dunes partially covering it on the western slope, and the immediately adjacent lake plain on the east. These three physiographic features give three different soils within a short distance and so should show the effect of the soil upon the vegetation.

The Beverly Ridge was a forested area at the time of the settlement of Illinois. The forest extended over all of the soil types with no differences. It is a typical oak-hickory mesophytic forest as described for this region by Dr. Cowles¹, Miss Schmoll², Mr. DeForest³, and others. This forest association is either a pre-climax or climax stage. The trees do not give any clue to a succeeding association but the undergrowth contains some species that occur in the beech-maple climax forest. Otherwise the forest contains those species usually found in the oak-hickory association. The presence of these smaller species usually found in mesophytic forests means that the oak forest was quite mesophytic and one type of climax, or that these species were forerunners of another association.

It is difficult to believe that the undergrowth would appear in advance of the trees with which they are usually associated. Such plants generally follow the trees because of the greater degree of mesophytism made possible by the growth of the trees. Therefore the only possible conclusion is that the forest at this time is mesophytic enough to support plants of the climax association. No native trees of the beech-maple forest are found here in any stages.

The origin of the forest on the lake plain is summed up in the following quotation⁴. "There is evidence that the lake plain at the 87th street forest preserve underwent a hydrarch succession. The vegetation that supports this view consists of an extensive stand of *Quercus bicolor*, *Viburnum lentago*, *Sambucus canadense*, *Crataegus mollis*, *Crataegus punctata*, *Tilia americana*, and relicts of *Onoclea sensibilis*. Many of these species

may be found in mesophytic forests but the quantity and denseness of the stand gives the appearance of a mature fen or flood-plain forest rather than a mature xerarch one. The presence of *Quercus velutina*, *Quercus macrocarpa*, and *Cornus racemosa* indicate that the forest is not now swampy."

As a corollary and supplement to the physiographic studies of the Beverly Ridge a similar study of the horticultural plants was undertaken. In order to reduce variable factors only woody plants growing in the native soils were used. The final list contained one hundred and twenty species classified by soils. This study, using several times as many species as the physiographic one on native plants, confirmed the previous findings. In addition to the confirmation of the general physiographic ecology, the horticultural study produced some other information of ecological importance.

The following excerpt points out some of this interesting ecological material. "Ecologists have admitted for a long time that different soils may eventually support the same plant association. Soil differences, however, have been called upon to explain the different associations in a succession on the same soil . . . Plants from different associations are found growing from comparative infancy to maturity in the same soil and under the same edaphic conditions. If differences in humus content, soil moisture, aeration, minerals, and acidity were significant in causing succession, then the mixing and blending of plant materials from different associations in artificial plantings would be impossible. The presence of thriving specimens of oaks, elms, maples, pines, and poplars in the same planting shows that soil differences are not significant in plant growth."

While the above extract only points out the more obvious examples of associational blending, such examples can be multiplied almost indefinitely. They include examples of widely distributed plants and narrowly distributed ones, some plants beyond their normal geographic ranges and others well within them.

The blending of hydrarch and xerarch associations occurs as well as blending of the associations in the successions. The most conspicuous case of this kind is in one planting where *Cephalanthus occidentalis* and *Hamamelis virginiana* occur side by side in full exposure.

From such horticultural evidences and from the physiographic ones, it is apparent that the three soils of the Beverly Ridge do not influence the distribution and growth of the native and introduced plants. Limiting factors, therefore, must occur in the seedling stage as they are ineffective on the transplanted plants. It is obvious also that the horticulture of a region can be used to test ecological theories as gardeners and landscapers do not usually work according to botanical laws or theories. A more extensive and intensive development of this field should prove fruitful to botanists and horticulturists alike.

1. COWLES, H. C., The Physiographic Ecology of Chicago and Vicinity, Bot. Gaz., Vol. 31, Nos. 2-3.
2. SCHMOLL, HAZEL, An Ecological Survey of Forests in the Vicinity of Glencoe, Ill., Trans. Ill. State Acad. Sci., Vol. 12, 1919.
3. DEFOREST, HOWARD, Plant Ecology of Rock River Woodlands of Ogle County, Ill., Trans. Ill. State Acad. Sci., Vol. 14, 1922.
4. GREEN, ELDRED, The Physiographic and Horticultural Ecology of the Beverly Ridge, Illinois, Thesis, University of Chicago, 1932.