PRAIRIES AND FORESTS OF McLEAN COUNTY, ILLINOIS

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Lucy Braun says that the prairies of Adams County, Ohio, owe their entrance and establishment to past conditions, that they are relic colonies, and that they entered the region at a time unlike the present. She goes on to say that certain vegetational remnants found at Mineral Springs are the result of a warm dry climate leading to the establishment of a prairie climax.

Homer C. Sampson in 1921 says in regard to the Prairies of Illinois, "The depressions, resulting from the formation of moraines across preglacial valleys became postglacial lakes and sloughs which were slowly drained. In general the moraines became forested, but many of the lakes and sloughs through gradual filling and draining became prairies." However, he makes no explanation of the origin of this phenomenon.

George H. Lane, writing of his pollen studies in north central Iowa in 1931 says, "Climatic changes inferred from changes in the vegetation as determined from pollen analysis are, (a) *warming* from 15 ft. to 10 ft., (b) *gradual drying* from 15 ft. to 8 ft. and (c) *grassland* climate above 8 ft.—of distinctly arid type at 8 ft. and at the 5, 4, and the 3 foot levels. No indication was found of recent increase of forests although recent conditions appear to be more humid than those at the 3 ft. level."

"There is no indication from this study that the forest is replacing grassland in Central Iowa."

Weaver says that "the prairie that lies within the climate of the deciduous forest is the sub-climax prairie, which in general represents an eastward movement of the climax prairie into the region of deciduous forest because of reduced rainfall."

Voss has shown by pollen analysis studies that spruce, pine, and fir were the common species in northern Illinois shortly after the retreat of the ice and that these species were followed by oaks and hickories.

When the early pioneers came to McLean County, they found that the oaks and hickories had been largely replaced by sugar maples and that the wet parts of the country were covered with tall grass prairies.

If we assume that the changes in the postglacial climate were from cool and moist to a warmer and then to a very dry climate followed by recent increases in humidity, then the presence of a maple forest on the moraines and of wet tall grass prairies on the lower areas can easily be interpreted.

In the shallow ponds and lakes that were left after the melting of the glacial ice, the submerged, the floating, the reed swamp and the sedge meadow stages of vegetation would follow in succession in spite of the gradual increase of warmth and atmospheric dryness. When the sedge meadow stage was ready to give way to the next stage in vegetational development, forest trees would have invaded if the climate had not become too xerophytic for the growth of pioneer tree species. Since the climate had become so continental, it was only natural for the tall slough grass and other wet prairie plants to possess the newly made water soaked humus.

When once slough grass became well established, it raised the level of the ground and made a place for the climax *Andropogons* and other typical prairie plants. It was climax for the xerophytic phase of the postglacial climate.

Later as the climate became favorable for forest trees to develop, trees were free to invade the prairie where ever they could get in.

D. P. White in 1941 says that black prairie soil full of humus developed under grasses is short in phosphorus and potassium and probably lacks the needed microrhiza that may aid in the establishment of trees.

At the time the wet prairies were developing under the influence of a xerophytic climate the forests on the moraines

were dominated by oaks and hickories. Because they were well established and because the water-table was high, there was a sufficiently favorable microclimate under the trees to allow the oaks and hickories to replace themselves under their own shade.

When the climate became more humid and less xerophytic, sugar maples replaced the oaks and hickories. This is as we have it now in such places as Funk's Grove. Under this less xerophytic and more humid climate the prairie grasses were able to hold their own against the invasion of trees.

The xerophytic climate was not rigorous enough, nor did it last long enough time to do away with the deciduous forest but on the other hand it came at a time that was critical in the development of the vegetation of low wet areas and it lasted long enough to allow the tall grass prairies to become so well established that in spite of the fact that when the climate became less continental so as to allow trees to invade the prairies, only man has been able to destroy them.