A Ten-year-old Forest in Lye Creek Prairie, Montgomery County

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In April 1936, on a farm, about ten miles northeast of Crawfordsville, Montgomery County, Indiana, a novel thing happened; the soil on a 60-acre tract of land caught fire. A farmer raked the cornstalks on the field into windrows and then set fire to them. The muck soil caught fire and burned for several weeks at the rate that a cigar burns. Before a

Fig. 1. The 60 acres of burned muck soil. Spring 1936. Photograph by Hirshburg.

rain came the fire had consumed the soil on half of the 60 acres to the depth of three feet which reached the blue shale which underlies this region. (Fig. 1) In some spots the soil was destroyed just a few inches. Neighboring farm land was saved by digging a trench three feet deep around the burning land.

To-day, ten years later, many of these acres are covered with exactly what the word jungle suggests to most people. Where the soil

burned down to the shale we find to-day a flora making a tangled mass of shrubs and trees ranging from five feet to twenty feet tall. Where the burning was to lesser depths a rank herbaceous growth holds its own. The latter plant growth came from seeds that lay in the soil below the level reached by the combustion and from seeds carried in by the wind. This vegetation is composed of grasses, sedges, smartweeds, swamp milkweed, goldenrods, asters, bugleweeds, cattails, etc. Trees had no chance to grow on the parts where seeds of these herbs were already present. For three years following the fire, liverworts and mosses grew on the areas where a shallow surface soil layer had burned. *Marchantia polymorpha* covered many continuous square yards and many acres in all.

Where the soil burned to the shale, living seeds and propagative stems from plants which had grown on the farm land as weeds thru

Fig. 2. A fallen 10-year-old Cottonwood in the Willow-Poplar jungle. Photograph by John I. Bechtel.

the years previous to the fire were, to a great extent, destroyed in the burning. On this severely burned area, during the past ten years a young forest has grown. The species forming the young forest community at this date are the following: *Salix interior, Salix cordata, Salix sericea, Salix petiolaris, Salix nigra, Salix amygdaloides, Populus deltoides, Populus tremuloides, Platanus occidentalis, Ulmus americana* (one individual), *Rhus toxicodendron, Cornus stolonifera, Cornus asperifolia,* and *Vitis vulpina.* We will note that the seeds of these plants were carried in by the wind or dropped by the birds.

The growth of the shrubby willows makes almost an impenetrable thicket over much of the wooded area. Here is the first known station for *Salix amygdaloides,* the Peach-leaved willow, in Montgomery County. Deam in his Flora of Indiana indicates that the nearest station

for this willow is about 50 miles distant. However there must be stations nearer than 50 miles yet to be listed. This species is abundant in this forest. Also there is in this young forest a herbaceous floor cover coming in at this date, species of which represent thirty different genera.

On tramping through this forest to-day one meets fallen willows and fallen poplars in all stages of decay. (Fig. 2.) Many of these fallen trees have trunks twelve inches in diameter. I have three reasons to offer for the short lives of these woody plants. First, the soil is very shallow and is composed mainly of coarse organic matter lying on a bed of shale. In this substratum the tree roots have little opportunity to find sufficient anchorage. Secondly, there is always subterranean water standing on the shale. This is easily observed in muskrat holes and where man tramps through the thin soil layer. Thirdly, whenever good rains come this area becomes flooded and water stands a few inches to two feet in depth for three to four weeks. It gradually drains off through vegetation choked drainage ditches. This standing water must become very short in a supply of oxygen. Because of these three reasons I believe that this Willow-Poplar forest will be short lived. I will venture a prophecy here, namely, that in not very many decades this forest will be succeeded by a grassy prairie like unto what it was before the land was broken for cultivation.

So far I have been talking about a tract of land which lies in the midst of what folks during the past century called the Lye Creek Prairie. In the fall of 1920 a native of Crawfordsville took me to see what he called a "real Montgomery County Prairie". He took me to a twenty-five acre tract of land which was just across the roadway northward from where the young forest described is now growing. The prairie visited then had been pastured but had never been touched by farm machinery. The grass was very thick on the ground. As we walked over it we frequently came to grassy ponds of water which were over shoe top and sometimes knee deep on us. Several flocks of wild ducks flew up ahead of us. I have heard sportsmen relate about the great hauls of wild ducks which were made decades ago from the Lye Creek and Potato Creek Prairies in the northeast part of Montgomery County.

Frequently from 1921 to 1928 I took my special students to this spot to show them a bit of open grassy prairie. On our visit in late May of 1928 we did not see a prairie but a stretch of black earth with corn seedlings peeping through its surface. A native son told us "The drainage ditch was deepened and a tractor did the rest". However, the cultivation of much of this prairie has not proved profitable. Heavy rains always turn it into lakes of water.

We have been told that prairies were treeless because there was not enough water to support tree growth, and, that the Indians set fire to them in order to destroy the tree growth. But in the case of this Lye Creek Prairie the tree growth is lacking because the amount of water present is excessive. Level of the water table is too high in this area for tree growth. In the ten-year-old Willow-Poplar forest which is now attempting a tree stand we find the water table to be just a few inches below the surface of the newly forming soil.

We have mentioned above that the willow shrubs, the willow trees, and the poplar trees are dying and toppling over. (Fig. 2) They took hold here following the fire because they had no competition. They have made a good start and are propagating themselves to some degree but the development of the herbaceous ground cover has begun to interfere. The older shrubs and trees are dying, although still in their youth. They are dying because of one operative factor in their habitat, namely, poorly aerated standing excess water. I believe that in the not distant future this willow-poplar forest and the land bordering upon it that has been intermittently farmed will return to its former state, namely, an open grassy prairie. Man would show wisdom by helping it to do so.