

THE FOSSIL FLORA OF NORTHERN ILLINOIS

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During Pennsylvanian times a large swamp stretched itself over most of Illinois, parts of Western Indiana, and Kentucky. An enormous accumulation of vegetable matter occurred there, developing in time an important coal field from which we now derive the benefit. The northern edge of this coal field runs a short distance north of the Illinois River, beginning in the east near the origin of that river where the Kankakee and Des Plaines rivers combine and running west in a straight line from the bend of the Illinois to the Mississippi. Near the northeast corner of the Illinois coal field lies a small mine near Braidwood from which large quantities of excellent plant impressions were collected out of the shales which overlie the coal. Another famous collecting place is the banks of the Mazon Creek near Morris, in Grundy County.

If we try to reconstruct a picture of the vegetation when the coal was laid down, our eyes see a tropical or sub-tropical swamp vegetation which contains gigantic club mosses and horse tails, big tree ferns, and climbing ferns, all small and large types of water plants, big gymnosperms, and, very likely, some angiosperms. In analyzing this picture we find something like two hundred or three hundred types of plants belonging to the great genera of *Lepidodendron*, *Sigillaria*, *Calamites*, *Cordaites*, *Sphenophyllum*, and a host of *Filicales* and *Cycadofidicales*. The *Lepidodendron* tree, the most stately representative of that flora, reached the height of one hundred feet and had a bark which was covered with rhomboid leaf cushions. Related to it was the *Sigillaria*, whose leaf cushions were circular or hexagonal instead of rhomboid. The roots of both big groups were long, stretched, snake-like organs creeping in the swamp. We even know the anatomy of these plants, because the coal balls which I discussed at a previous meeting¹ produce beautiful microscopic sections of the tissues and woods

¹ See A. C. Noe, Transactions Illinois State Academy of Science, Vol. 17 pp. 179, 180.

from fossil plants. The strange thing which we observe in looking at the wood of these trees is that they have no annual rings. Perhaps the climate of that time was even throughout the year with no seasonal differences. The reproduction of these plants occurs through spores which were produced in cones of the size of a pine cone.

The group of *Calamites* represents gigantic horse tails twenty to thirty feet high and from one to two feet in diameter, producing strong woody stems which bore peculiar longitudinal furrows on the outside. Here the reproduction took place by spore-bearing cones.

The fourth great tree group of that time was formed by the *Cordaite*s, which had slender stems as high as a hundred feet and bore tufts of long gigantic needle-like leaves. These gymnosperms were of an extinct type, but somewhat related to our conifers.

A little smaller than the previously mentioned group are the tree ferns, but here we run into a peculiar difficulty. Apparently there were true ferns and fern-like gymnosperms at that time. These plants bore leaves of ferns and seeds of gymnosperms. Judging from the thousands of impressions which paleobotanists have gathered of fossil ferns and fern-like plants, there must have been a great variety of them.

Finally, we may mention a small group of fern-like water plants—the *Sphenophyllales*. They had wedge-shaped leaves attached to floating stems whose ends bore cones filled with spores.

The flora which I have just sketched is taken from the roof of coal No. 2, but corresponds to a European flora, like the Stephanian of France or the Ottweiler series of the Saar Basin, which are much higher in geologic position. It seems to us as if the fossil plants of the so-called No. 2 coal would either force us to give another number to the coal or to disbelieve the generally accepted theory of a uniform flora in carboniferous times which extended all over the earth from the Arctic to the Antarctic and whose contemporary horizons must have shown almost identical composition.