

COAL BALLS HERE AND ABROAD

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A coal ball is a calcareous or siliceous coal seam concretion which frequently contains recognizable plant fragments.* These plant fragments have furnished our entire knowledge of the inner structure of paleozoic plants. They have been observed since 1835 in England where Williamson used them in his monumental studies of fossil plants since 1875, a work which was continued by D. H. Scott in England, C. D. Bertrand in France, and many others.

The existence in America of coal balls was suspected by the author who succeeded in obtaining in 1922 the first specimens of genuine American coal balls. These came from Harrisburg, Illinois; later good specimens were found in Danville, Illinois, in Calhoun (Richland County), Illinois, and in Streator, Illinois. Other American deposits are in Iowa where coal balls showed up at Des Moines, Indianola, and Chariton. Good specimens were also collected by the author near Sturgis, Kentucky, and at Cayuga, Indiana. They were found outside of England, France, and America in Austria, Germany, Russia, Czecho-Slovakia, Poland, and Australia.

Of the American coal ball specimens from Harrisburg, Danville and Calhoun thin sections have been made in the botanical laboratory of the University of Chicago. The following genera of fossil plants were observed and their structure carefully examined:

Harrisburg—

Sphenophyllum stem
Lepidodendron stem
Lepidodendron sporangium
Stigmara and rootlets
Anachropteris
Angiospermophyton
Root with spongy tissue
Fern sporangia and spores
Calamites leaf, probably in all three places.

Danville—

Lepidodendron stem
Lepidodendron sporangia
Stigmara and rootlets (few)
Sturiella minor

Fern sporangia
Root with spongy cortex
Peculiar leaf
Calamites leaf

Calhoun—

Sphenophyllum stem
Calamites stem
Bothrodendron stem
Microsporophyll and sporangium
Megosporophyll and sporangium
Stigmara rootlets
Numerous multiseriate fern, sporangia with spores
Lyginodendron stem

* Jose Maria Feliciano, *The Relation of Concretion to Coal Seams* (Journal of Geology, Vol. 32, pp. 230-239, 1924).

The results of these investigations are being published by Dr. G. H. Hoskins and Miss Fredda Reed in the *Botanical Gazette*. The most important of these discoveries was the appearance of a paleozoic angiosperm in one of the Harrisburg Coal Balls.* Among the unpublished material are several other angiosperm specimens which make the existence of angiosperms in the paleozoic beyond question.

Our entire knowledge of the inner structure of paleozoic plants has been based upon English and French coal balls. It is to be hoped that the American coal balls which have come under observation will contribute in the near future as rich material as was obtained formerly from England and France, and that our knowledge of plant structure will in this way be greatly enriched from American sources.

* J. Hobart Hoskins: *A Paleozoic Angiosperm from an American Coal Ball*, *The Botanical Gazette*, Vol. 75, pp. 390-399.