

James R. Jennings: Fossil plants from the Upper Mississippian in the Illinois Basin, USA.

Paleobotanists are a rare breed even among the paleontologists. Hence, we were most fortunate to come across Dr. James Jennings while he was on a short teaching contract with a local college which prepares students for further studies at Southern Illinois University. Not only did he join the GSM as a member but he also agreed to give a talk on his paleobotanical research on the Chester Series of the Illinois Basin. About a dozen interested geologists attended his talk held at the Geology Lecture Hall of the University of Malaya on 18th March 1985. An extended abstract of his talk is given below but much more could have been gleaned if one had seen the excellent slides which he used to illustrate his talk. There was enthusiastic response from the floor during question time and some even remained behind for further discussions after the meeting.

Abstract

The Chester Series constitutes the upper part of the Mississippian System (Lower Carboniferous) in the Illinois Basin, its type area. It conformably overlies thick carbonates of the Meramecian, and is unconformably overlain by Lower Pennsylvanian clastic sediments. The magnitude of the unconformity decreases southward; and the Chester Series attains its maximum thickness of about 1,400 feet along the southern border of the Illinois Basin. It consists of about $\frac{1}{2}$ shale, $\frac{1}{4}$ limestone and $\frac{1}{4}$ sandstone, and is divided into individual formations which are composed alternately of limestone and shale or sandstone and shale. Fossil plants are associated with all of the major clastic-dominated units and are most commonly encountered near the top in geographic regions where the sandstone is thickest. Commonly, thin coals are also present in conjunction. The fossil plants are preserved as impressions, compressions and petrifications. The petrifications are mostly preserved in pyrite or marcasite but calcareous petrifications also occur. The fossil plants include lycopods, arthropytes, ferns, and seed ferns. The lycopods are the most abundant plant group numerically, and *Lepidodendron volkmarnianum* and *L. veltheimii* are common along with *Stigmaria stellata*, *S. ficoides*, and various leaves and cones. The arthropytes are almost entirely referable to *Archaeocalamites*, although a few specimens of *Sphenophyllum tenerrimum* and *Calamites* are also present. The most common of the ferns is *Senftenbergia* which is a frond that was produced by some ankyropterids. The seed ferns are the most diversified group and includes both highly dissected, 'Rhodea'-type forms and various forms with laminated pinnales. Pollen organs (e.g. *Telangium* and *Potoneia*) and seeds (e.g. *Rhyhchogonium*, *Trigonocarpus*, and *Gnetopsis*) are present with the fronds. Detailed biostratigraphy is now possible utilizing the fossil plants. Floristic change is gradual throughout the Chester Series, but there is an abrupt change at the top of the Chester Series which is the Mississippian/Pennsylvanian boundary.

Footnote: Dr. Jennings has made several trips to the East Coast (alone and also with C.P. Lee of UM) to collect and study the plant fossils, especially those of Carboniferous age, while he was here.


