

## FOSSILIFEROUS ZONES OF THE UPPER PENNSYLVANIAN OF VERMILION AND EDGAR COUNTIES, ILLINOIS

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The McLeansboro (Upper Pennsylvanian) in Vermilion and Edgar counties in eastern Illinois is exposed along Vermilion River and Brouillet Creek and their tributaries. The McLeansboro has been sub-divided into the following cyclothems (ascending order): Sparland, Gimlet, Trivoli, Shoal Creek, Flannigan, Macoupin, and Livingston. The composite section in Vermilion County includes about 300 feet of strata and in Edgar County nearly 400 feet. The regional dip of the strata is to the southwest. The names of the various cyclothems have been previously assigned by other workers. Further detailed study of the fauna of these cyclothems may prove or disprove their correlation with their type sections in other parts of the state.

In general the strata consists of shale, sandstone, limestone, underclay, coal, and conglomerate in about that order of abundance. Marine invertebrate fossils occur in strata above the coal zones of each cyclothem, and in calcareous sandstones below the coal in a few instances. Plant remains have been found in a few places in shale, sandstone, and limestone.

Land vertebrate fossils were collected many years ago from reddish shales in the lower part of the Shoal Creek cyclothem in Vermilion County, and erroneously referred to the Permian. Marine fossils occur in greatest abundance in the limestones, and in decreasing abundance in the calcareous shales, black fissile shales, limestone conglomerates, and sandstones.

The megascopic fossils indicate a wide range of ecological conditions. They are very abundant in most of the marine members of the cyclothems. The most common genera are: *Dictyoclostus*, *Neospirifer*, *Composita*, *Juresania*, *Lino-productus*, *Lophophyllum*, *Sphaerodoma*, *Meekospira*, *Naticopsis*, *Bellerophon*, *Pharodonotus*, *Euphemites*, *Myalina*, *Allorisma*, *Schizodus*, *Astartella*, *Pinna*, and many others. Several trilobites have been found in the Macoupin.

The ostracods are the most common of the micro-fossils and will, when further study is made, be of considerable value in correlation of the Pennsylvanian in Illinois. For example, *Geisina gregaria* has been found only in the Trivoli in Vermilion County. It is known to occur at

the same stratigraphic position in Peoria County. This form was originally described in 1906 from the Kansas City group of Kansas and called *Beyrichiella gregaria*. It is probable that other forms will be of equal value when their stratigraphic ranges have been determined. The dominant ostracod genera vary between cyclothems. The most common genera listed in the order of abundance are: *Bairdia*, *Cavellina*, *Hollinella*, *Amphissites*, *Kirkbya*, *Bythocypris*, *Geisina*, *Jonesina*, and *Kelletina*.

Foraminifera occur throughout the McLeansboro section. One of the important forms is *Triticites irregularis*, which has been found also in the Winterset beds of Iowa. This form occurs in a shale parting in the Livingston limestone. Other common foraminifera are: *Ammodiscus*, *Tetrataxis*, *Ammovertella*, *Polytaxis*, and *Glyphostomella*. *Glyphostomella triloculina* thus far has been obtained from only the Macoupin.

Conodonts have been found in several zones, even from the uppermost sandstone in the Vermilion section.

In the Sparland, at the base of the thick marine shale, may be found an irregular black fissile shale that bears a pyritized, dwarfed fauna. Gastropods abound, with lesser numbers of brachiopods, pelecypods, some cephalopods, and ostracods. The overlying shale contains varying amounts of megascopic fossils, especially pelecypods.

The Gimlet in Vermilion County is represented by a thin basal sandstone and a limestone conglomerate, while in Edgar County there has been an addition of several members to the cycle and a thickening of the strata to nearly 90 feet. The limestone conglomerate is found in Edgar County also. It is of marine origin apparently, for in it there are crinoid stems, shark teeth, brachiopods, and bryozoa. In some areas it contains microfossils in the shales.

The Trivoli in Vermilion County yields largely micro-fossils, while in Edgar

County it contains large numbers of megascopic, as well as microscopic fossils. The marine shale immediately overlying the coal zone in Vermilion County may be divided into two distinct zones on the basis of the micro-fauna.

The Shoal Creek in Vermilion County contains fossils in the nodular lime. In Edgar County there is an expansion of this cycle and a corresponding increase in the number of forms.

The Flannigan yields large numbers of microscopic as well as a large megascopic fauna. The members of the cyclothem are more completely developed in Edgar County.

The Macoupin is ideally exposed along Salt Fork of Vermilion River in Vermilion County. At the base there is a sandstone which grades upward into a siltstone. This is succeeded by a fresh water limestone at the base of the underclay immediately below a coal. The coal is immediately overlain by a black fissile shale. The black fissile shale grades upward into a dark carbonaceous, fossiliferous shale. The limestone varies from pure crystalline to argillaceous, and is very fossiliferous, containing large numbers of both megascopic and microscopic fossils. The overlying shale contains fossils also.

The basal sandstone of the Livingston cyclothem in Vermilion County is exposed along the Salt Fork. The black shale, an overlying blue shale, and limestone have been exposed in the Fairmount quarry. In Edgar County there is a continuous section along Brouillet Creek. The basal sandstone contains *Lingula* and *Aviculopecten*. The black shale overlying the coal and the green shale at the base of the limestone bear conodonts. The limestone here is tentatively correlated with the one in Vermilion County. It is from the shale partings in this limestone that *Triticites irregularis*, has been collected.

Although the general stratigraphic succession has been studied, this is the first detailed study of the fauna that has been undertaken.