CEPHALASPIDS FROM THE MIDDLE ORDOVICIAN PLATTEVILLE LIMESTONE

GEORGE H. FRAUNFELTER
Southern Illinois University, Carbondale

ABSTRACT. — The remains of exoskeleton parts of Ostracoderms, cephalaspids, were collected from the Platteville Limestone (Middle Ordovician-Black Riveran) in two quarries near Dixon, Lee County, Illinois. The two best specimens, which are figured and described, consist of one medium-sized individual with most of the head shield, a pectoral fin and part of the trunk preserved, and one large, disarticulated pectoral fin. The specimens appear to belong to species of the Order Osteostraci, Family Hemicyclaspididae (Ateleaspidae). The remains are dolomitized and, hence, do not retain the structures of bone as viewed in thin section.

To my knowledge no Ordovician fish remains have been reported from the Midwest. Denison (1967) reviewed old material and described and figured new material from the Middle Ordovician Harding Sandstone (Black Riveran) of the West. The material reported here was largely collected from a quarry southwest of Dixon (SE¼ NE¼ Sec. 12, T.21 N., R.8 E.), Lee County, Illinois. A few specimens were found as float in the Medusa Cement Company quarry just northeast of Dixon (Figure 1). All of the material is dolomitized.

The cephalaspid remains occur on erosional surfaces associated with argillaceous partings and along bedding planes in the yellowish-brown dolomite. Specimens also occur in the upper part of the underlying argillaceous blue limestones, again along erosional surfaces. The remains are fragmentary and/or crushed with some of the elongate parts, such as the pectoral fins,

FIGURE 1. North side of quarry southwest of Dixon. Arrows indicate beds containing cephalaspid remains.

showing alignment due to transport. Most of the remains, however, appear to be randomly distributed. Found associated with the cephalaspid remains are such marine invertebrates as brachiopods of the genus *Opikina*.

The first specimens were collected by John Washburn of the Illinois State Highway Department, Elgin. Additional material was collected by James C. Grenda, a graduate student in Geology at Southern Illinois University, Neil Healy of Sterling, Illinois and the author.

Our specimens were placed in the Order Osteostraci because of the closely-spaced eyes high on the head in the medium-sized specimen and in the Family Hemicyclaspididae because all of the pectoral fins preserved have thickened marginal rims. No cornua are developed.

The medium-sized individual (Figure 2) possesses a head shield which is wider than high, about 52 mm. X 33.5 mm. in maximum measurements. It has a raised, smooth, marginal rim anteriorly and laterally, about 2.5 mm. in width. The dorsal surface of the shield is finely tuberculate, but poor preservation does not allow recognition of any pattern, if one existed. The orbits are nearly round in outline, somewhat elongate, and about 3.5 mm. in diameter. The nasal fossa is also nearly round, but somewhat elongate, in outline, and is interrupted by a prominent medial ridge, anteriorly and posteriorly, which apparently bears the aperture, although the latter is not visible. The pineal plate is incompletely developed. The relatively large oval dorsal field is bounded laterally by two low ridges which join posteriorly with a low, dorsal crista. The latter continues posteriorly across the dorsal shield and on to the trunk. The lateral fields are large and roughly crescent-shaped. The posterior part of the dorsal shield is either segmented or bears several rows, two to three, of alligned plates. The trunk segments are wide and bear scattered, large tubercles on the surface. The portion of the trunk preserved is about 60 mm. long and relatively narrow. A large, about 16.5 mm. wide X 56 mm. long, pectoral fin is attached to the posterior side of the head shield. This pectoral fin is elongate, bent slightly trunkward and tapers posteriorly to a narrow, rounded end. The fin is ornamented with narrow, prominent, sinuous, radial ridges and coarse, marginal scales, which give the edges a knurled appearance. These sinuous ridges are also intermittently developed on the ventral fin surface. The upper fin surface is slightly convex upward. The posterior median margin of the head shield has a rounded, posteriorly-directed lobe. No evidence of the sensory canals is preserved.

The specimen described was apparently triangular in cross-section with an arched head shield.

The well-preserved, disarticulated pectoral fin (Figure 3) is tongue-shaped and measures about 152 mm. long X 40 mm. wide, medially. Prominent side scales give the fin edges a knurled appearance; while prominent, sinuous, narrow ridges ornament the dorsal and ventral fin surfaces, the latter of which is nearly flat and the former slightly convex upward. Median areas of the

FIGURE 2. Photograph of the described medium-sized specimen collected from yellowish-brown dolomite. Southern Illinois University Museum No. V-5.

dorsal fin surface bear prominent, narrow longitudinal ridges which cross the prominent, narrow, sinuous radial ridges, giving the surface a reticulate appearance. This pectoral fin is about 3 mm. thick, medi-

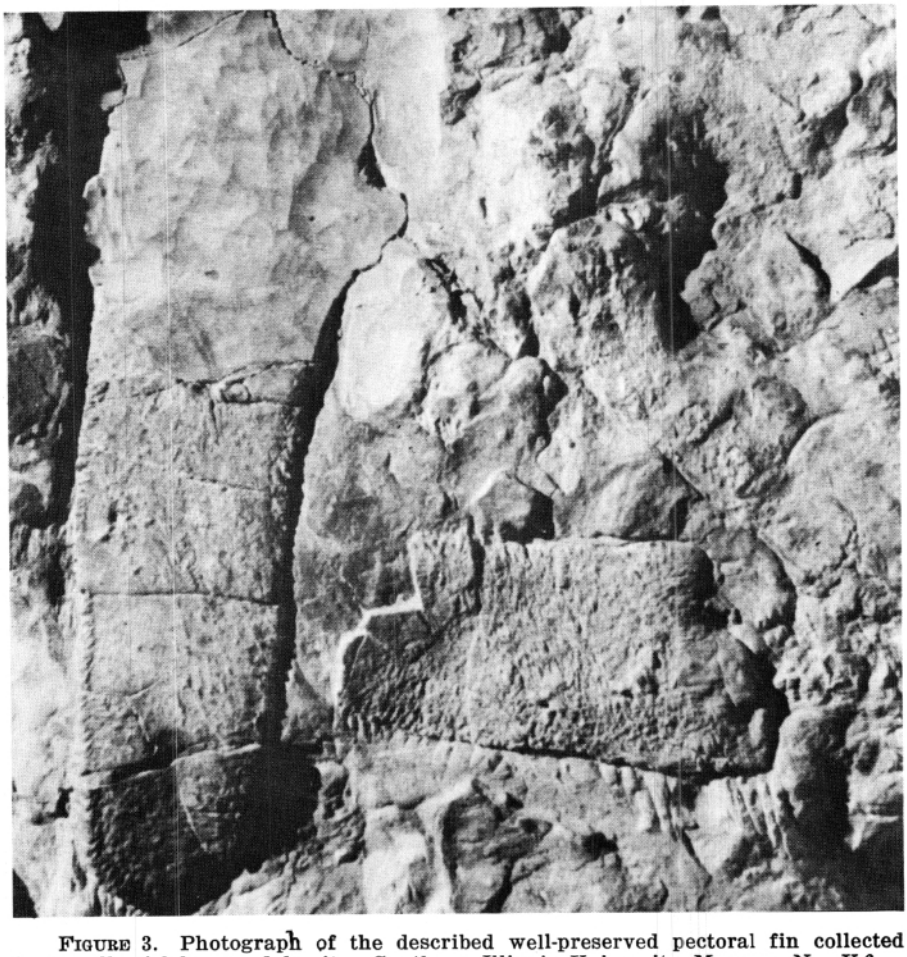

FIGURE 3. Photograph of the described well-preserved pectoral fin collected from yellowish-brown dolomite. Southern Illinois University Museum No. V-6.

ally. Wide segmentation is visible on the ventral side.

CONCLUSIONS

The range of the Osteostraci, cephalaspids, is extended back to Middle Ordovician, Black Riveran, times.

The Heterostraci were not necessarily older than the Osteostraci.

The older Silurian genera of Ostracoderms which lacked pectoral fins and possessed a head shield which covered a large portion of the trunk were not necessarily primitive forms.

REFERENCE CITED

DENISON, R. H., 1967, Fieldiana-Geology, Chicago Field Museum of Natural History, vol. 16, pp. 131-192.

Manuscript received Sept. 15, 1969.