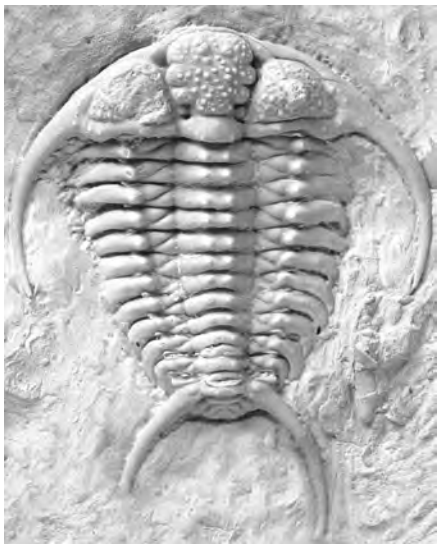
Illinois State Geological Survey

Geobit 6

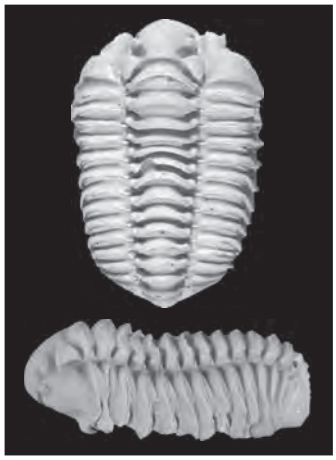
The Trilobite—An Early Inhabitant of Illinois



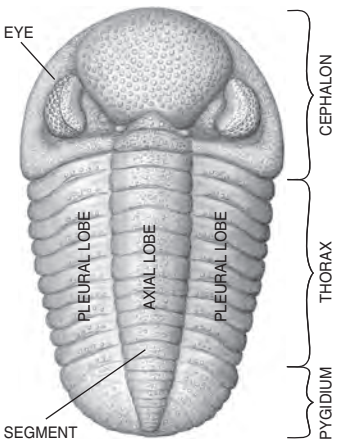
Ceraurus cf. *pleurexanthemus* Green. Found in Ordovician age rocks of the Grand Detour Formation, Platteville Group, near Rockford, Illinois (shown lifesize).

Many strange creatures have inhabited Illinois in the past and have left their fossil remains entombed in the rocks that underlie our prairie lands. One such animal is the trilobite, an extinct marine arthropod that is distantly related to the living crabs, lobsters, and crayfish.

Trilobites were among the earliest inhabitants of Illinois. The oldest specimens have been found in Cambrian age rocks formed approximately 500 million years ago (see chart). After the Ordovician Period the trilobites slowly declined in abundance and diversity, finally becoming extinct at the close of the Permian Period, about 200 million years ago. They swam in the warm, shallow seas that covered all of Illinois and most of North America and crawled on and burrowed in the muddy sea bottoms. As the seas advanced and retreated over a span of about 350 million years (Paleozoic Era), the trilobites slowly evolved —that is, changed structurally and functionally through time—into a great variety of forms. They were variously adapted as scavengers, predators, and filter feeders that occupied niches in the level sea bottoms and in reef communities. Trilobites lived with sponges, corals, clams, snails, brachiopods, crinoids, and other marine animals.



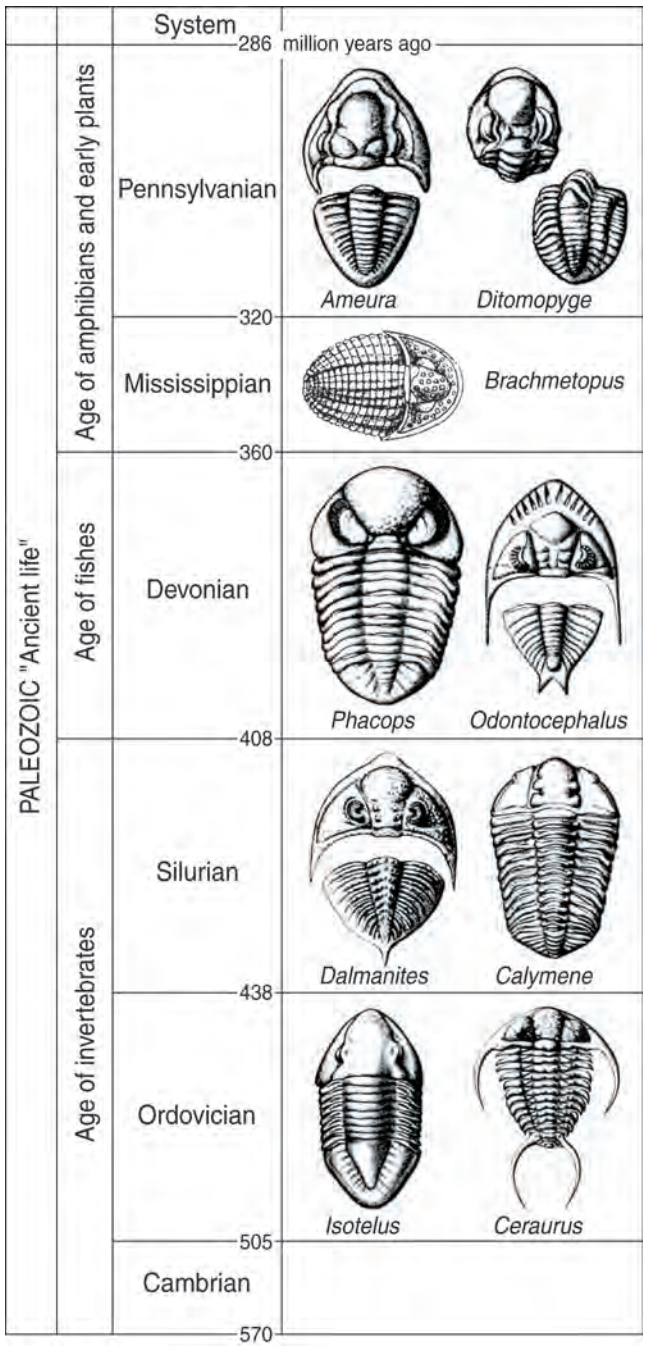
Calymene celebra Raymond. Dorsal (top) and side views of a specimen found in the Silurian age Racine Formation near Grafton, Illinois (shown lifesize).



Dorsal view of *Phacops*, a common Devonian trilobite, showing various structures (shown lifesize).

Trilobite structure

Trilobites are so named because the segments on their upper (dorsal) surface usually possess longitudinal furrows that form a three (tri-) lobed division of the body. The central lobe is called the axial lobe, and the two lateral counterparts are called pleural lobes. The dorsal surface consisted of a hard, mineralized protective shield called a carapace; it is this part of the shell, or exoskeleton, that is most commonly preserved in the fossil record. The lower (ventral) surface bore a pair of antennae and numerous pairs of jointed appendages that served as walking, swimming, feeding, and respiratory organs. The ventral surface, however, consisted of relatively soft tissue and rarely is preserved. A typical trilobite is about 2 inches long, but some are less than half an inch in length and giants of the group measure fully 2 feet.



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Like the living crustaceans (crabs, lobsters, crayfish, etc.), trilobites shed their shells periodically in order to grow. In some species a single trilobite produced 27 shells or more. In fact, it is very likely that most trilobite fossils are the discarded shells. Although trilobite fragments are rather abundant in some rocks, complete specimens are rare. It was only under the most exceptional conditions, such as burial by sediment before or immediately after death, that complete trilobites were preserved relatively unchanged.

The popular fossil

Because of their unusual and interesting appearance, trilobites are among the fossils most sought after for collection and study. Avid collectors continually comb the countryside searching for new trilobite localities. The best collecting is at outcrops of shale, limestone, and dolomite in quarries, roadcuts, and natural exposures. The Paleozoic rocks of Illinois have long been known for their abundant and well-preserved trilobite fossils. Cambrian age trilobites have been found in a few small outcrops in north-central Illinois and in several cores drilled from deeply buried rocks at various localities throughout the state. Some of the better trilobite collections have been made from the more accessible Ordovician and Silurian rocks that are exposed in the northern and southwestern parts of the state. Trilobites have been found in some post-Silurian Paleozoic rocks in Illinois, but they are much less abundant and diverse than those in the older rocks.

Trilobite dating

The study of trilobites is not just an academic exercise. Trilobites are useful in determining the relative age of some sedimentary rocks. Knowing the relative age is important for economic reasons, particularly where it is necessary to locate and identify strata containing oil, natural gas, coal, and ore deposits. The study of such index fossils and their relationship to the strata in which they are found is call biostratigraphy.

Contributed by Dennis R. Kolata