more abundant remains, indeed, three complete *Odontocephalus* specimens (two flat, one enrolled) have been found at the Falls in the past 25 years. Small trilobites in the silicified layer of the *Brevispirifer gregarius* zone are found as white quartz fossils in orange chert.

The Sellersburg Limestone (Silver Creek Chert) is probably the richest Devonian source of trilobites in the area. *Eldredgeops* is found almost exclusively. Complete, enrolled specimens are not rare, but require luck to find. Flattened specimens are much rarer. Cephalons with well-preserved compound eyes are fairly common, as are pygidia and pygium-thorax combinations. Chert can be glassy, but is far more common as porous, impure material with poorly preserved specimens.

Figure 3: *Eldredgeops* is a common trilobite in the Devonian. It is most often found disarticulated or enrolled. It has large compound eyes.

Figure 4: Crassiproteus pygidium composed of quartz.

Trilobites from the Falls area

A diverse assemblage of trilobites is known from the Falls of the Ohio. This table lists species that occur in local Devonian rocks. It is likely that new species await discovery.

Jeffersonville Limestone

Arctinurus sp.
Anchiopsis anchiops (Green)?
Anchiopsis tuberculatus Stumm
"Calymene" platys (Green)
Coronura aspectans (Conrad)
Coronura myrmecophorus (Green)
Coronura helena (Hall)
Crassiproteus clareus (Hall)
Crassiproteus crassimarginatus (Hall)
Crassiproteus macrocephalus (Hall)
Greenops kindlei Ulrich & Delo?
Odontocephalus bifidus (Hall)
Odontocephalus magnus Stumm
Odontochile pleuroptyx (Green)
Eldridgeops nasutus Stumm
Eldridgeops pipa Hall & Clarke
Trypaulites calypso (Hall)

North Vernon Limestone

Comura sp.?
Crassiproteus crassimarginatus (Hall)
Greenops boothi variety calliteles (Green)?
Greenops pleione (Hall)
Phacops rana (Green)

**Specimens with "?" indicate questionable occurrence.*

References and suggested reading

Boardman, R.S., et al (Eds.), 1987. Fossil Invertebrates. Blackwell Scientific Publications, pp. 213 - 241. College level text book.

Delo, David M., 1940. Phacopid Trilobites of North America. Geological Society of America, Special Paper 29. Out of print. Good information and illustrations.

Stumm, E. C., 1954. Lower Middle Devonian Phacopid Trilobites from Michigan, Southwestern Ontario, and the Ohio Valley. Contributions from the Museum of Paleontology, Ann Arbor, MI. Vol. XI, pp. 201-221.

Trilobites

AT THE FALLS OF THE OHIO

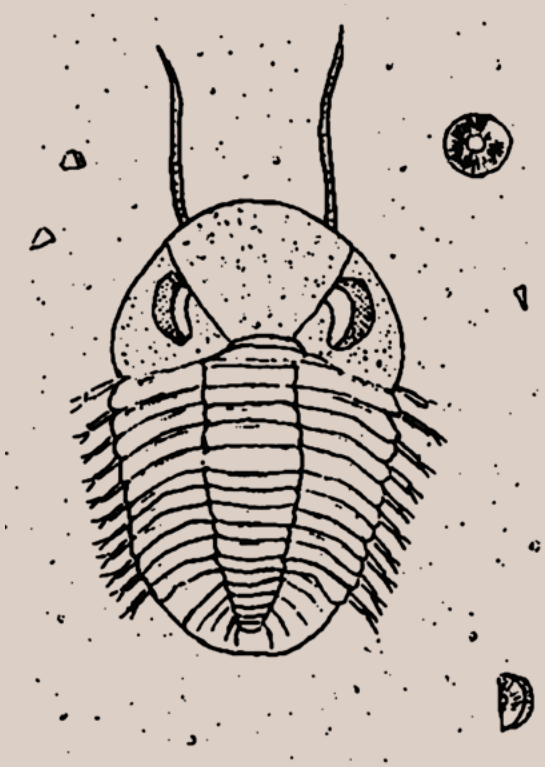

Figure 1: *Eldredgeops* trilobite reconstructed as living on the sea floor.

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Memories made naturally. INDIANA STATE PARKS

FALLS OF THE OHIO

Trilobites and dinosaurs are two of the most identifiable kinds of fossils. There are over 22,000 species of trilobites and 700 for dinosaurs. Although these animals did not exist at the same time (trilobites disappeared shortly before the first dinosaurs appear in the fossil record), they do share one thing in common: both are extinct. Trilobites became extinct about 250 million years ago, coinciding with the great Permian extinction – the largest extinction event in earth's history. They didn't die out suddenly. Their demise began with the rise of predators like cephalopods in the Ordovician Period.

What were trilobites?

Trilobites were marine arthropods -- invertebrates (without a back bone) related to insects and crustaceans. They thrived in an ocean environment that was similar to those where shrimp or lobster live today. Trilobites were among the first arthropods, appearing in the fossil record at the beginning of the Cambrian Period, around 600 million years ago. Highly mobile, these creatures were among the first to develop a hardened exoskeleton. It was calcite, more rigid than the shells of modern crustaceans. As a result, trilobites may be found beautifully preserved as fossils today.

They were the first animals believed to develop good visual acuity (though some species were blind). Some paleontologists believe trilobites were the first animals with color vision. The position of their compound eyes allowed them to see their environment. They were always alert to the creatures that preyed on them. This is the same reason why it is hard to kill a housefly.

The body of a trilobite is divided into three main parts—the cephalon or head, the segmented thorax, and the pygidium or tail. The cephalon contains the many internal organs. The thorax contains the intestines and gill structures. The pygidium contains the anus. The name trilobite means "three lobed" in Greek. It refers to the axis that runs from the head to the tail. There is a central axis and a pleural lobe on either side (see figure 1).

The mouth of the trilobite, called a hypostome, was located beneath the cephalon. It was a scoop-like apparatus. Most trilobites were detritus feeders, pulling nutrients from the sediment on the sea floor. Some of the larger varieties may have been predatory, going after worms or other soft organisms.

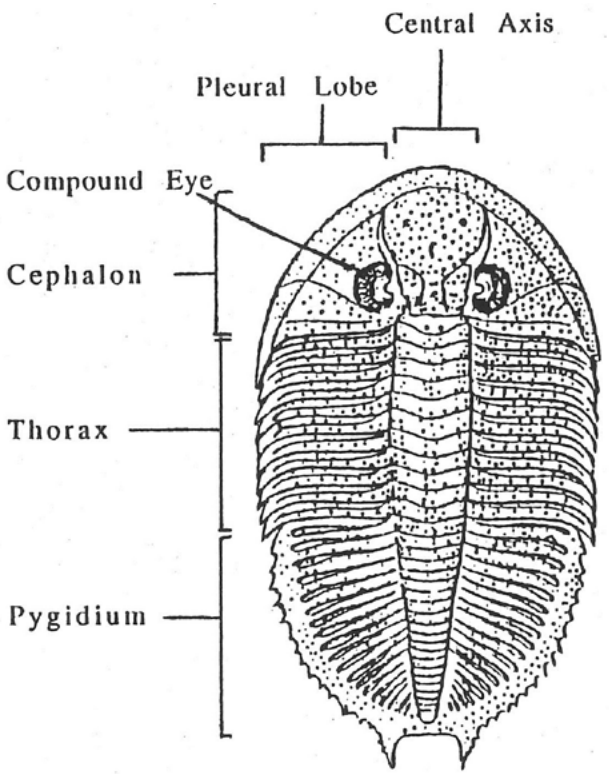

Figure 2: Parts of a trilobite

The thorax consists of varying numbers of interlocking segments. Adults of a particular trilobite species had a specific number of thoracic segments. These segments enabled trilobites to bend or enroll for protection like a modern pill bug (roly-poly). The tracks of trilobites have been found preserved in ancient muddy sea floor deposits.

Some trilobites developed extensive spines to ward off predators or to allow them to swim. Most were simple spines occurring as modifications of the head or tail regions. Some developed spines on the back of, or lateral projections from, the thoracic segments. Some Devonian species have spines projecting from the back of their compound eye!

The chief method of dodging predators was to burrow into the sediment and hide. Trilobite resting places have been found preserved in rock layers. Rarely they are found with the fossilized creature preserved in its burrow!

Some trilobites have been found that preserve fossilized soft tissue. Detailed anatomical studies unparalleled among extinct creatures have been done. Jointed appendages that provide locomotion and gill-like structures have been observed. Preservation of the ends of the legs matched the track prints that were thought to belong to these invertebrates. The digestive and muscle systems of trilobites have also been studied. Sensory antennae have been attached on the underside of the head of the trilobite. In 1994 the first fossilized microscopic trilobite embryos were reported.

Like most arthropods, trilobites molted or shed their exoskeleton as they grew. The rocks at the Falls of the Ohio contain common molted fragments that range in size from 1/4-inch (6 mm) to more than 3 inches (8 cm) across. Complete trilobites are known but are very rare. One of the largest Devonian trilobite species was found in New York rock layers equivalent to the coral beds at the Falls of the Ohio. This spiny trilobite called *Terataspis grandis* (Hall) was about 18 inches (46 cm) long! Only one has ever been found. *Coronura myrmecophorus* (Green) may be the biggest trilobite to have resided at the Falls 390 million years ago. The largest reported specimen was 16 inches (40 cm) long based on the size of the pygidium. Although giant trilobites have not been documented, they probably do occur in the rock layers in the Louisville metropolitan area. The Middle Devonian environment was a shallow, wave swept sea floor, which teemed with life. The remains of large trilobites would have to be buried quickly, or they would have been destroyed by scavengers and ocean currents.

Finding Trilobites

Trilobites are common in the Middle Devonian rocks in and around the Falls area, but they are hard to find without a close examination of the rock surface. Casual walks on the fossil beds will not be as productive as hands-and-knees scrutiny. Most specimens tend to be molt fragments under two inches (5 cm) in diameter. Pygidia are more common than cephalons or thoracic sections because they are more robust and were easier to preserve. Small phacopid, proteid, and larger dalmanitid-types are dominant in the Jeffersonville Limestone.

The coral zone of the Jeffersonville Limestone has larger trilobite remains, though they are rarer than upper layers. The bryozoans-brachiopod zone has