

Platyceras symmetricum Hall
Platyceras thetis Hall
Platyceras ventricostum Conrad
Pleuronotus decewi (Bilings) **figure 3**
Polyphemopsis louisvillae Hall & Whitfield =
Holopea?

Soleniscus carinatus (Nettelroth)
 **Soleniscus hebe* (Hall)
 **Straparollus exiguus* Kindle
 **Straparollus planodiscus* Hall
Straparollus sampsoni (Nettelroth)
Trochonema emacerata Hall & Whitfield
 **Trochonema meekanum* (Meek)
Trochonema rectilatera Hall & Whitfield
Trochonema yandellana Hall & Whitfield
Turbinopsis shumardi (DeVerneuil) **figure 1**

Clams

Actinodesma erectum (Hall)
Actinodesma occidentale (Hall)
Actinopteria boydi Conrad
 -*Cardiopsis crassicosata* Hall & Whitfield
Clinopistha antiqua Meek
Clinopistha striata Nettelroth
Clinopistha subnasuta Hall & Whitfield
Cornellites fasculata (Goldfuss) =
Cornellites flabella Meek
Cornellites grandis (Hall)
Cypricardinea cataracta Conrad
 -*Cypricardinea cylindrica* Hall
Cypricardinea indenta Conrad
Eoschizodus contractus (Hall)
Glyptodesma cancellata Nettelroth = *Limoptera?*
Goniophoria hamiltonensis Hall
Goniophoria truncata Hall
 -*Grammysoidea arcutata* (Hall)
Grammysoidea secunda var. *gibbosa* (Hall)
Grammysoidea subarcutata (Hall)
Leptodesma spinigerus Conrad =
Leptodesma rogersi Hall **figure 7**
Limoptera cancellata Hall
Modiomorpha concentrica Conrad =
M. charlestownensis Nettelroth?

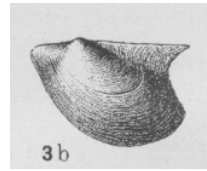


Figure 7
Modiomorpha myteloides Conrad =
M. affinis Hall and *M. alta* Conrad
 -*Modiomorpha recta* Hall
Nuculoidea hanoverensis (Kindle)
Nuculoidea corbuliformis (Hall)
Nuculoidea herzeri (Nettelroth)
 **Nuculoidea lirata* (Conrad) =
N. lamellata (Hall)
Nuculoidea neda (Hall & Whitfield)
Nuculoidea notica (Hall & Whitfield)
Paracyclas ohioense Meek =
P. elliptica Hall and *P. elongata* Nettelroth
Paracyclas rugosa Conrad =
P. liriata Conrad **figure 8**
Pseudaviculopecten crassicosata (Hall & Whitfield)
Pseudaviculopecten exactus (Hall)
Pseudaviculopecten fasciculatus (Hall)
Pseudaviculopecten princeps (Conrad)
Pseudaviculopecten terminalis (Hall)
Pterinopecten nodosus Hall
Pterinopecten reflexus Hall
 **Pterinopecten undosus* Hall
Ptychodesma knappianum Hall
 **Sanguinolites? sanduskiensis* Meek
Solemya vetusta Hall
Yoldia? valvulus Hall & Whitfield

Rostroconchs

Bigalea sp.
Hippocardium cuneus (Hall) **figure 9, 9a**

* Reported from the Jeffersonville Limestone in central Indiana, but *might* occur in Falls area.
 - Inadequately described from the Falls area.

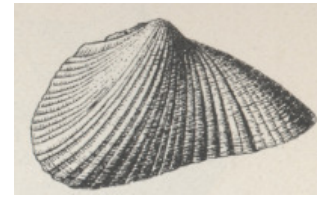
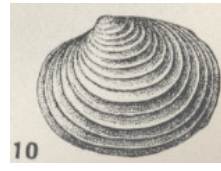


Figure 9: Side view



Figure 9a: End view

Suggested Reading

The Audubon Society Field Guide to North American Fossils, I. Thompson. Published by Alfred A. Knopf, 1982. Good general fossil book.

The Devonian Fossils and Stratigraphy of Indiana, E. M. Kindle, Indiana Dept. of Natural Resources, 1901. Out of print. Identifies most Devonian brachiopods found in Indiana. May be found in college, university and large public libraries.

Fossil Invertebrates, edited by R.S. Boardman, A.H. Cheetham, and A.J. Rowell. Published by Blackwell Scientific Publications, 1987. Chapter 16. College level text.

Kentucky Fossil Shells, Henry Nettelroth. Kentucky Geological Survey, 1889. Out of print. The first comprehensive, well illustrated book of fossil brachiopods and mollusks from Kentucky. This is a rare book, but may be found in large public or university libraries in the region. It is on-line at the Kentucky Geological survey web site: <http://www.uky.edu/KGS/coal/webfossil/pages/nettelroth.html>

Illustrations (except figure 1) in this brochure are from Kindle and Nettelroth's publications cited above.

Ancient Shells at the Falls of the Ohio Part II: Mollusks

by Alan Goldstein



External Cast (model) Internal Cast (fossil)

Figure 1: Preservation of the Devonian gastropod *Turbinopsis shumardii* (DeVerneuil)

What would it have been like to be a shell collector during the Devonian period, between 408 and 360 million years ago? Today collectors find shells in a variety of shapes, sizes and colors washed up on a beach. Those are shells of mollusks, usually gastropods (snails) and bivalves (clams).

The fossil-bearing rocks at the Falls of the Ohio indicate that a Devonian beachcomber would have found mollusks and other types of shells washed up. The most common shell-bearing creature in the Devonian at the Falls is almost never found washed up on a beach today - that is the brachiopod (pronounced brak - e - o - pod). Snails, clams and the occasional cephalopod would have been found, too. However, their shells were usually composed of the calcium carbonate mineral known as aragonite. Sometime after burial, unstable aragonite would dissolve away by moving ground water. Brachiopod shells were composed of calcite (a stable form of calcium carbonate),

which were more often preserved intact. As a result, many fossil mollusks are not found as clearly preserved shells. Internal casts show the shape of the interior, formed when the empty shell is filled with sediment. Casts showing the exterior of the shell are much less common at the Falls of the Ohio (figure 1). Molds -- the opposite of a cast -- are formed when a fossil has been removed leaving a fossil-shaped impression in the rock.

What are mollusks?

There is no character common to all mollusks. Snails and clams are the best-known examples of this phylum. They can be found in the Ohio River today just as their distant ancestors inhabited the shallow sea floor preserved at the Falls from about 387 million years ago. No doubt mollusks without shells, like the sea slug, existed in the ocean so long ago. Creatures without shells were (and are) unlikely to become fossils.

Snails (Class Gastropoda) have the body contained in an asymmetric coiled shell. The tip of the shell is usually pointed away from the head. Sole-like foot is used for creeping. The head is distinct and can move independently from the body.

One snail that deserves a closer look is *Platyceras* (figure 2). Eighteen species may be attributed to the genus

Platyceras and *Orthonychia* (a similar snail). It may be split into more species than might have actually existed. Platycerid snails were commonly coprophagous, living off the waste products



Figure 2

of other organisms, particularly crinoids. Their shape may be influenced by the shape of their host organism. A few varieties may exceed four-inches (10 cm) in length, too large to feed on

crinoid waste. These may have fed on algae or organic debris in the sediment.

Turbinopsis (figure 1) is the largest fossil snail at the Falls. It probably fed on abundant algae in the shallow Devonian sea.

Snail shells come in a variety of shapes.

Turbinate: *Turbinopsis shumardi* (DeVerneuil), see figure 1, front of this brochure.

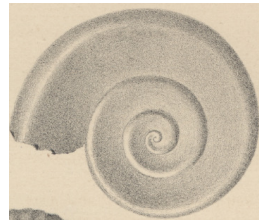


Figure 3

Planispiral:
Pleuronotus decewi
(Billings) figure 3, left.



Figure 4

Turretiform:
Palaeozygopleura hamiltonia
(Hall) figure 4, right.

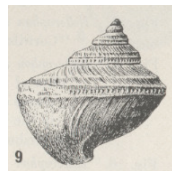


Figure 5

Trochiform:
Bembexia sulcomarginata
(Hall) figure 5, left.

Bellerophonts require are noteworthy because there is discussion whether or not they are gastropods, monoplacophorans (tergomyans) or something else. They are spiraled in a flat plane and unlike most snails, exhibit bilateral symmetry, figure 6, right.

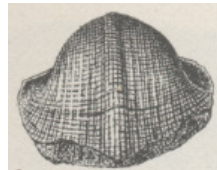


Figure 6

Clams (Class Bivalva) have the body contained between two symmetrical shells. The shell is hinged with "teeth" and "sockets" and is opened or closed with special muscles and ligaments. Clams do not have a head. They feed, respire and reproduce through two siphons. One draws in and the other exhales water. Although clams like scallops live on the surface and can move by ejecting water from the siphon (figure 7), most live buried in sediment (figure 8). Some mussels attach themselves to rocks and other hard surfaces by tough fibers called byssal threads, becoming completely immobile. The modern invasive Zebra Mussel is an example.

Rostroconchs (Class Rostroconchia) are bivalve shells that were confused for years as belonging to arthropods like trilobites (figure 9). This class of mollusks has been extinct since the end of the Permian. There are no modern descendants. They lived buried in sediment, similar to the life style of many clams.

Cephalopods (Class Cephalopoda) are univalve shell mollusks related to the octopus. Locally, these carnivores are extremely rare Devonian fossils. They occur as straight cones, semi-coiled, fully-coiled or egg-shaped shells. The chambers inside the shell allowed the animal to become more or less buoyant depending on the amount of water or gas in the chambers.

List of Mollusks in the Falls Area¹

Bellerophonts

Bellerophon pelops (Hall) = *Acanthonema*?
Ptomalis patulus (Hall)
Retispira leda (Hall) **figure 6**
Tropidodiscus curvilineatus (Conrad)

¹Cephalopods are omitted from this list.

Gastropods

**Aclinsia barnetti* Kindle
**Aclinsia barnetti* var. *elongata* Kindle
Bembexia arbella (Nettelroth)
Bembexia procteri (Nettelroth)
Bembexia sulcomarginata (Conrad) **figure 5**
Bucania devonica Hall & Whitfield
**Capulus cassiensis* Kindle
*"*Cyclonema*" *crenulata* Meek
-"*Cyclonema*" *multilira* Hall
Elasmonema bellatula (Hall)
Elasmonema clarki (Nettelroth)
Elasmonema imatator (Hall & Whitfield)
-*Isonema humulis* (Meek)
Mourlonia lucina (Hall)
Mourlonia lucina var. *perfasciata* (Hall)
Murchisonia desiderata Hall
Naticonema lineata (Conrad)
Naticonema turbinata (Hall)
Naticopsis levis Meek
Orthonychia conicum (Hall)
Orthonychia fluctuosum (Ulrich)
Palaeozygopleura hamiltonia (Hall) **figure 4**
Palaeozygopleura laeviusculum (Hall)
Palaeozygopleura rectistriatum (Hall)
**Palaeozygopleura?* *teres* (Hall)
Platyceras? *arctiostoma* Ulrich
**Platyceras blatchleyi* Kindle = *P. dumosum?*
Platyceras bucculentum Hall **figure 2**
Platyceras carinatum Hall
Platyceras compressum Nettelroth
Platyceras dumosum Conrad and varieties
Platyceras echinatum Hall = *P. dumosum?*
Platyceras erectum Hall
Platyceras fornicatum Hall
Platyceras indianensis Miller & Gurley
Platyceras lineare Kindle
Platyceras milleri Nettelroth
Platyceras multispinosum Meek
Platyceras rictum Hall
Platyceras subcirculare Kindle