

Invertebrate Fossil Identification

Taxonomy

Taxonomy is the science of naming of organisms. Humans and , for example, are classified as follows:

Kingdom – Animalia
Phylum – Chordata
Class – Mammalia
Order – Primates
Family – Hominidae
Genus – Homo
Species – *Homo sapiens*

In this handout, we'll only concentrate on the phyla and classes for a few important marine invertebrates (animals without backbones which lived in the oceans) commonly preserved as Paleozoic Era fossils in our local area. Classifying these organisms more exactly than this is usually too difficult and would be done in a course in paleontology – the study of ancient life.

Important Phyla and Classes of Fossils

Phylum Cnidaria, Class Anthozoa – These are the corals. Corals are organisms with radially-symmetric hollow bodies, tentacles around their mouths, and specialized stinging cells. The coral polyps build calcium carbonate structures and are important reef formers. Corals may be solitary organisms (the horn corals) or colonial (where many individuals live in a large reef structure).

Phylum Bryozoa – Bryozoa are tiny filter-feeding colonial organisms which build a calcium carbonate structure which have varied appearances (lacy fans, corkscrews, and twig-like shapes are common).

Phylum Brachiopoda – Brachiopods are shelled organisms which have a left-right symmetry across their valves (shells). They lived attached to the seafloor and were very abundant in the geologic past (Paleozoic Era) but are fairly rare today. They were filter feeders.

Phylum Mollusca, Class Bivalvia – Bivalves are common shelled organisms like clams, oysters, and mussels which are generally filter feeders and live in or on top of the seafloor sediments. These are extremely common marine invertebrates today but less common as fossils the further back in geologic time you go. They differ from brachiopods in having symmetry between the dorsal (top) and ventral (bottom) valves (shells).

Phylum Mollusca, Class Gastropoda – Gastropods are snails which may be either marine or terrestrial. They have a three-dimensional coiled shell and are herbivores and carnivores.

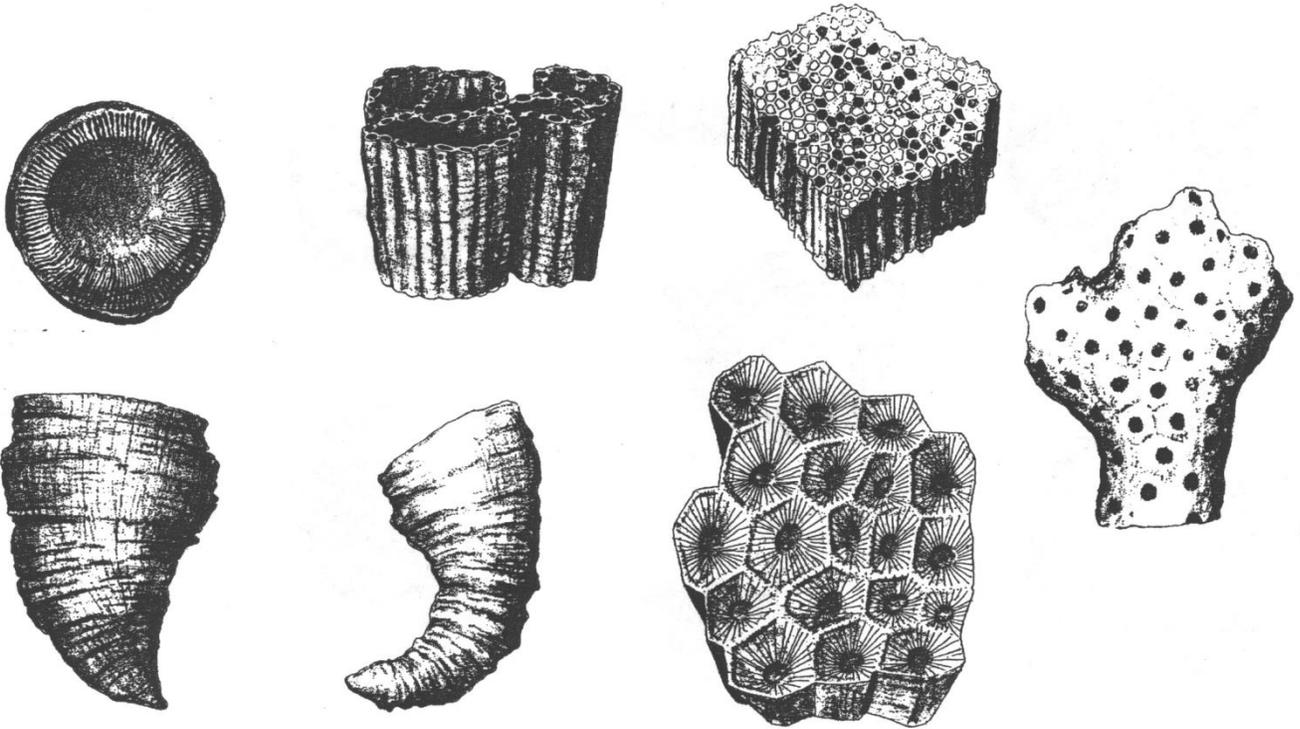
Phylum Mollusca, Class Cephalopoda – Cephalopods are animals like squids and the chambered nautilus. They typically have either a straight or a two-dimensional spiraled shell and are generally active carnivores.

Phylum Arthropoda, Class Trilobita – The trilobites are three-lobed (axial and two pleural lobes) scavengers and are all extinct but they were extremely common in the geologic past (Paleozoic Era). They're related to modern lobsters, shrimp, and insects (these are all arthropods – animals with jointed legs and exoskeletons).

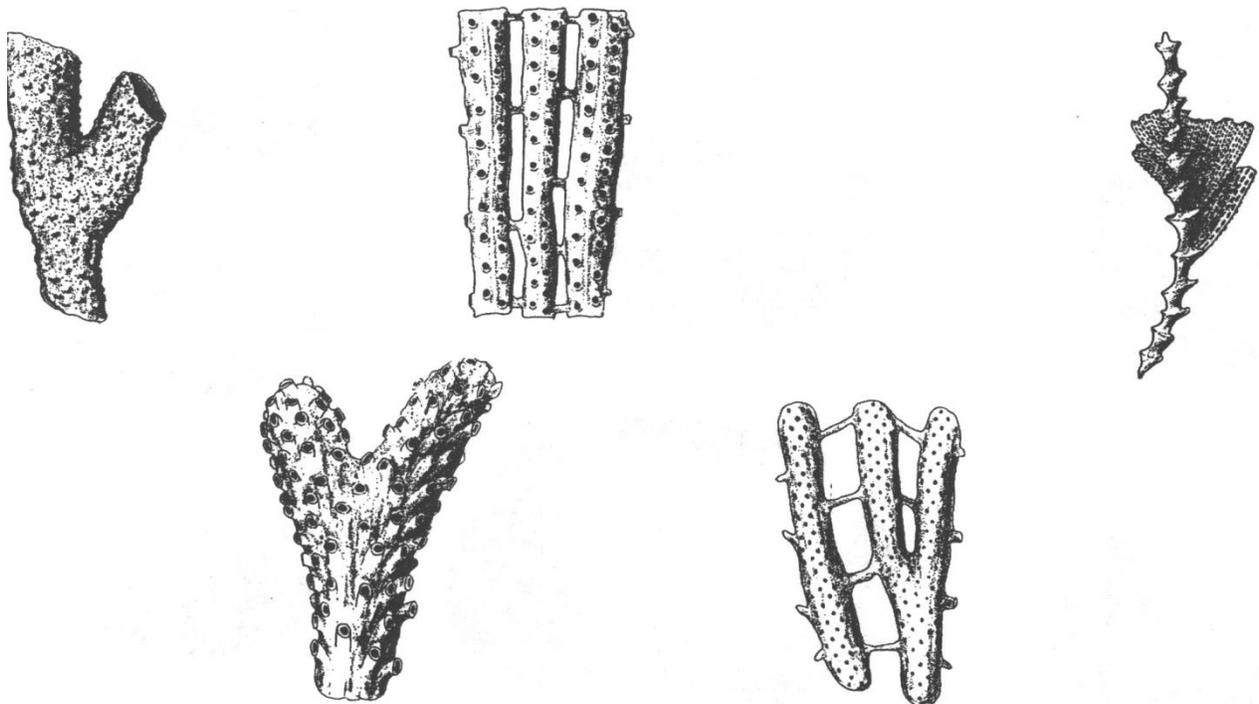
Phylum Echinodermata, Class Crinoidea – Crinoids or sea lilies are animals (even though they resemble plants) which are filter feeders and lived attached to the seafloor. Fragments of their stems (called columnals) are commonly preserved as fossils.

Phylum Echinodermata, Class Echinoidea – The echinoids are sea urchins and sand dollars. They wander around the seafloor, most-commonly eating sediment or plant material. They are characterized by having a five-fold (pentameral) symmetry.

PHYLUM CNIDARIA, CLASS ANTHOZOA

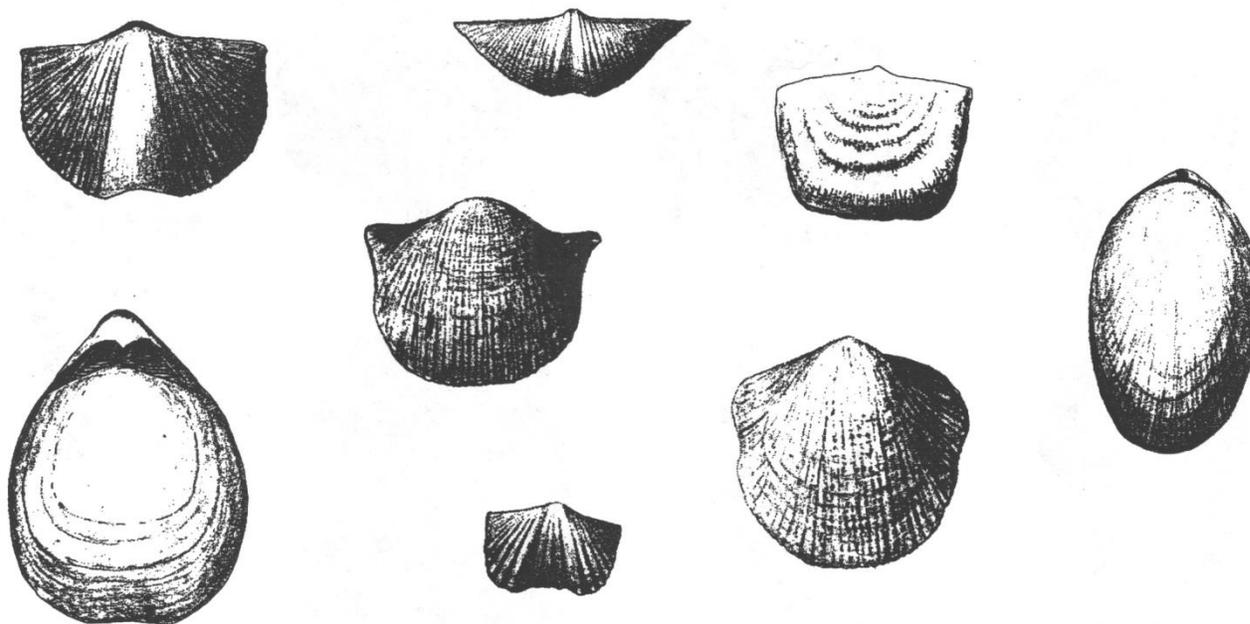


PHYLUM BRYOZOA

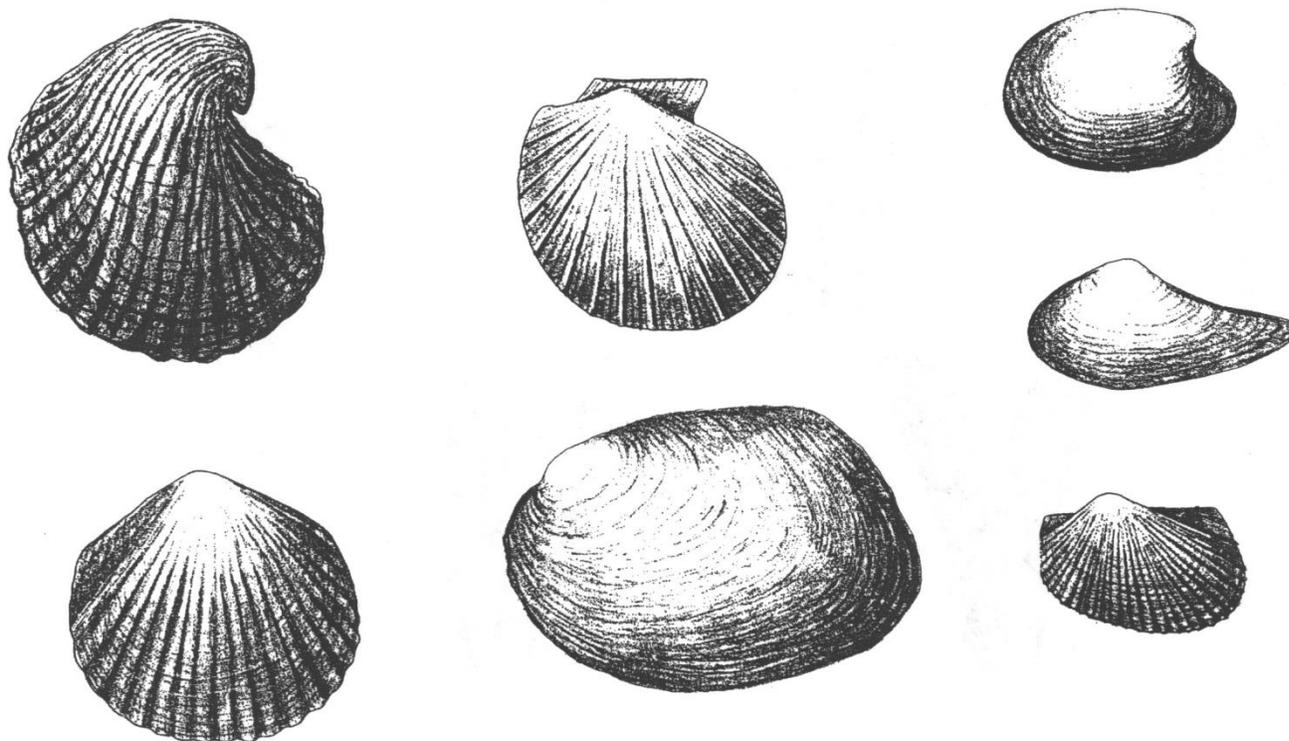


Bryozoa and anthozoans (corals) can look similar. Corals generally have bigger holes while the holes in the bryozoa are typically pinhole-sized

PHYLUM BRACHIOPODA

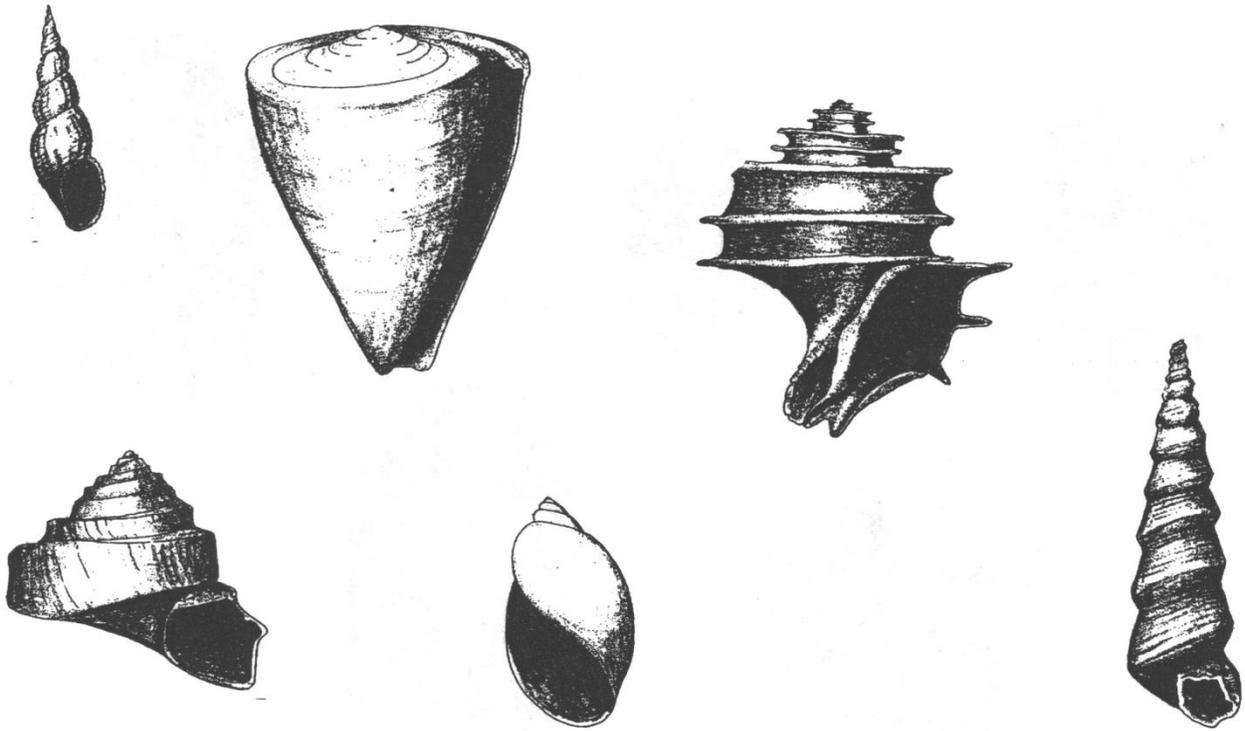


PHYLUM MOLLUSCA, CLASS BIVALVIA



Brachiopods and bivalves can look similar. The top and bottom of brachiopod shells are different but they have a left-right symmetry. The top and bottom of bivalve shells are similar and they don't have a left-right symmetry

PHYLUM MOLLUSCA, CLASS GASTROPODA

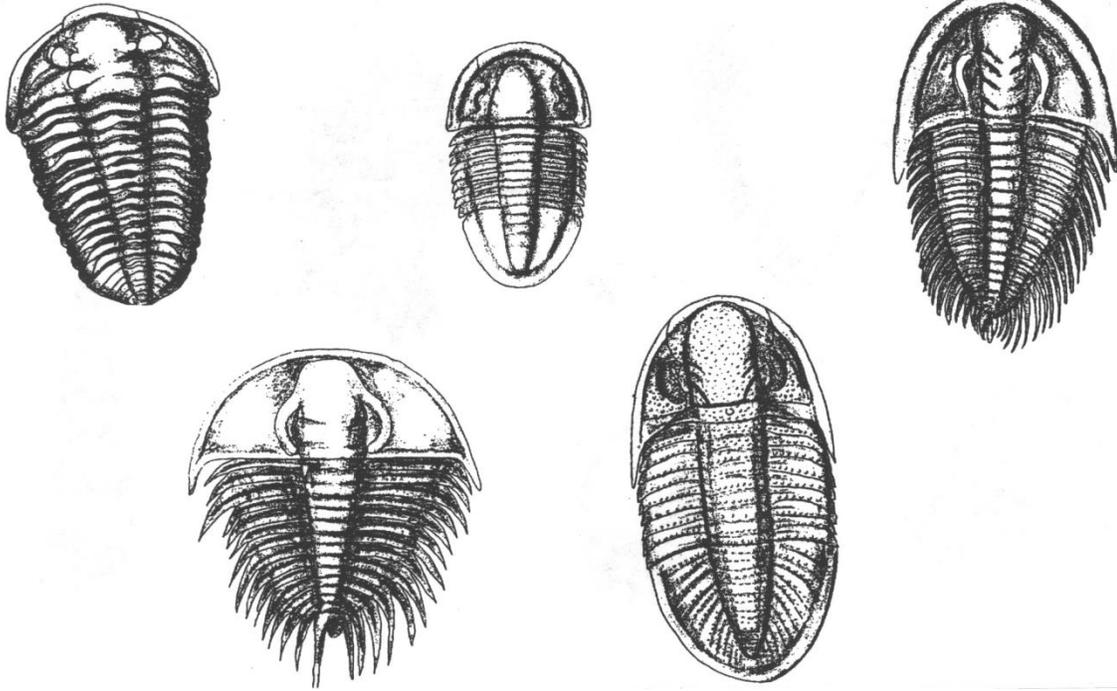


PHYLUM MOLLUSCA, CLASS CEPHALOPODA

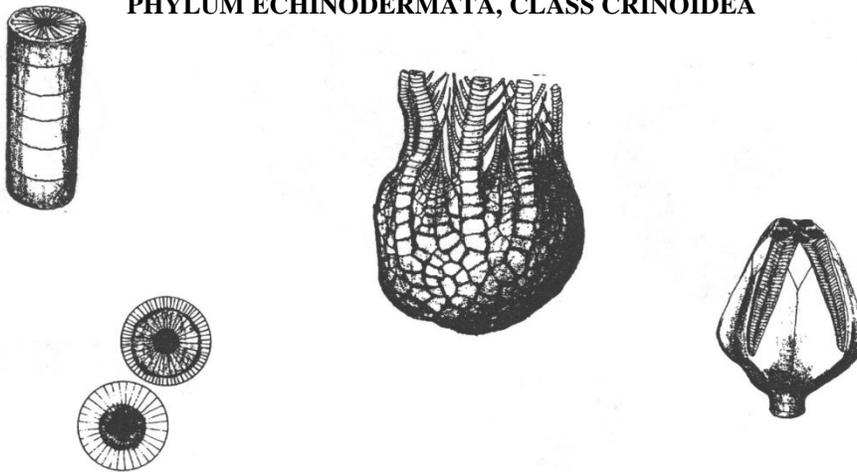


Gastropods and cephalopods can look similar. Cephalopods are typically spiraled in two-dimensions (flat) which gastropods are typically coiled in three-dimensions

PHYLUM ARTHROPODA, CLASS TRILOBITA



PHYLUM ECHINODERMATA, CLASS CRINOIDEA



PHYLUM ECHINODERMATA, CLASS ECHINOIDEA

