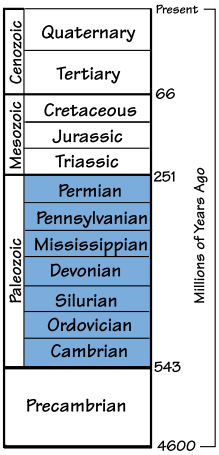
Fossils of the Exotic Terrane
Region 4

Rocks of the Exotic Terrane region in general do not have preserved fossil communities because either they are metamorphosed sedimentary rocks or they are igneous rocks without fossil communities. Interesting exceptions occur in Paleozoic rocks, which include both fossils from the Ordovician onward, fossils from the accreted terranes, and fossils of organisms that lived in the Iapetus Ocean. Fossils after accretion of the terranes to the Northeast contain organisms that actually lived in the region and were not transported on the terrane.

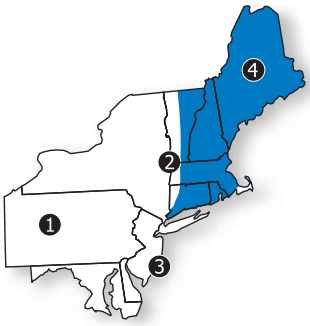


see Geologic History, p.12, for more on the New England basins.

see Rocks, p.49 for more on the Boston Basin

Some species of trilobites (Paradoxides) *found in the Boston Basin rocks of Braintree, Massachusetts are significantly larger than Inland Basin trilobites of the same age, averaging 30 cm long.*

see Fossils, p.5, for more on **these organisms;** *for* Bivalves, *see p.96.*



Paleozoic

Fossils as old as the Cambrian are known from the eastern Massachusetts ***Boston Basin*** and are preserved in rocks of the exotic terrane Avalonia. These rocks are believed to have originally been part of northern Africa, sutured to the side of North America during the Acadian mountain-building event. The fossil assemblages are like those in northern Africa but different from equivalent-aged fossils in North America. These fossil assemblages were among the earliest evidence for continental plate movement and exotic terranes.

Graptolites have been found in Ordovician rocks in Maine, possibly existing within the Iapetus Ocean. Silurian and Devonian fossils (which also existed in the Paleozoic inland ocean) are found in limestones from Maine and New Hampshire, including ***corals, crinoids, brachiopods, trilobites, bryozoans, bivalves,*** and ***tentaculids***. Devonian fossils in New Hampshire, though badly preserved in schist, include brachiopods. The Devonian plant fossil, *Pertica quadrifaria*, *(Figure: 4.28)* is preserved in parts of northern Maine, an area of the Exotic Terrane that experienced only weak metamorphism.

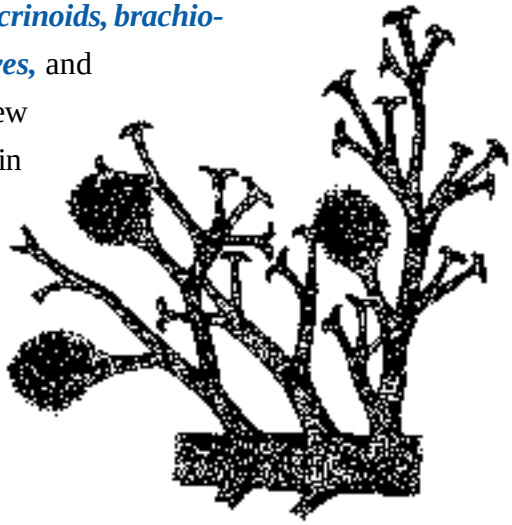


Figure 4.28: Maine state fossil: Pertica quadrifaria, *Devonian.*

Pennsylvanian basins found in

Rhode Island and Massachusetts contain a rich record of plant fossils, and rarer amphibian tracks, insects, and arachnids. These fossils are similar to those preserved in ***Pennsylvanian-age rocks*** in the Inland Basin, though in less extensive deposits.

see Fossils, p.92 for more on fossils found in **Pennsylvanian-age rocks.**

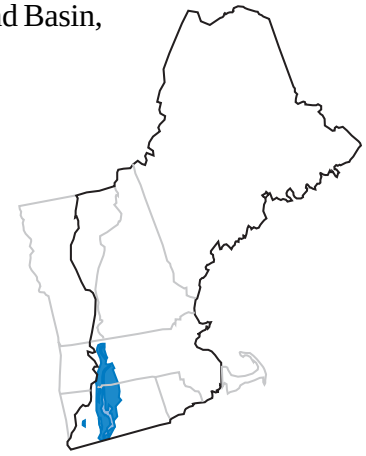


Figure 4.29: Triassic-Jurassic rift basin in the Exotic Terrane.

Triassic to Jurassic

The western Massachusetts Connecticut River Valley, part of a Triassic rift basin *(Figure 4.29)*, is the site of Pliny Moody's 1800 description of *three-toed* dinosaur footprints, which he thought were made by a raven from Noah's Ark *(Figure 4.30)*. This was also the area of Edward Hitchcock's early to mid-1800's interpretation of hundreds of dinosaur tracks as bird footprints. At one locality in ***Connecticut***, the footprints are so numerous that a museum has been built over them. In some localities there have also been discoveries of dinosaur bones, fish *(Figure 4.31)* , crocodiles, and other vertebrates. One well-known discovery by a teenage fossil collector was of an unusual gliding reptile. However, as in the Newark and Gettysburg rift basins in the Appalachian/Piedmont, vertebrate bone fossils are rare compared to the numerous footprints.

see Fossils, p.92, for more on **rift basin fossils.**

Many three-toed *footprints named* Grallator *are thought to have been made by the dinosaur* Coelophysis.

Dinosaur State Park in Rocky Hill, **Connecticut** *was established where the rift basin dinosaur trackways are particularly numerous.*

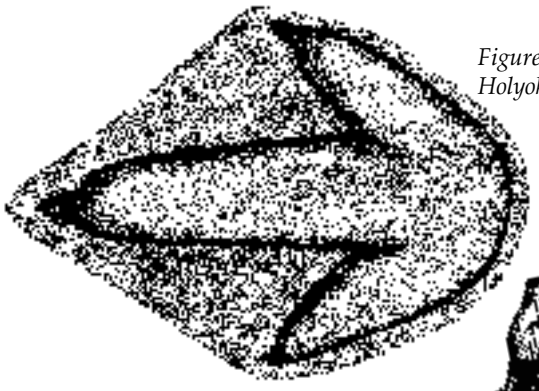


Figure 4.30: Three-toed dinosaur track from Holyoke, Massachusetts (13 cm long).

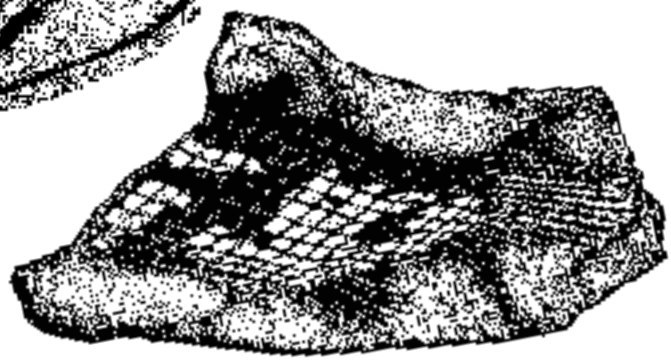


Figure 4.31: Fish, Semionotus, *Early Jurassic, Massachusetts (5.5 cm long).*

Where did the dinosaurs go?

Based on considerable geochemical and mineralogical evidence, many scientists have concluded that the Cretaceous-Tertiary boundary extinction was caused by a meteorite impact leading to the demise of the dinosaurs. In this scenario, a worldwide layer of dust was created by the impact, blocking out sunlight long enough to destroy the food chain and causing other ecological problems. The large reptiles disappeared, as well as significant numbers of ma-