PENNSYLVANIAN OF TEXAS

Paleontological Society of Austin

It seems odd to talk about the 'Pennsylvanian of Texas'. The Pennsylvanian is a geologic time period named for the state of Pennsylvania where it is particularly well expose. In North America, the Mississippian and Pennsylvanian periods are used instead of the Carboniferous Period, which covers that same time frame in other parts of the world.



During this time adaptations occurred in animals and plants that allowed for reproduction on dry land. In the case of plants, the adaptation was the further evolution of the seed, which first appeared in the Devonian Period. In the case of animals, it was the amniotic egg a key feature in the origin of reptiles. In both cases, these adaptations severed the ties to water, allowing for life-long terrestrial habitation.

The vast amount of plant material provided by extensive forests led to huge coal deposits in Pennsylvania and the Appalachians. Also characteristic of this period was the diversification of amphibians and insects. Some of these insects grew to very large sizes – e.g. dragonflies with wingspans of 2.5 feet and cockroaches that were a foot long. Millipedes, scorpions, and spiders also became significant inhabitants of the lush forests.



N. America in the mid Pennsylvanian¹

NORTH CENTRAL TEXAS UNDER THE SEA

However, in Texas the bulk of exposed Pennsylvanian formations are marine, as can be seen by the fossils below.



Lophophyllidium proliferum. (coral) Brown Co. ²



Neospirifer cameratus (Brachiopod) Brown Co. ²



In much of the US, the rocks of the Pennsylvanian subperiod can be distinguished from those of the older Mississippian by their terrestrial nature. But in Texas the bulk of exposed Pennsylvanian formations are marine. See the red ellipse in the image above.



Pecopteris fronds Montague Co.³

Lepidodenron reconstruction ⁵

PLANTS

No discussion of the Carboniferous would be complete without talking about the distinctive plants of that time. The map above shows that in addition to the shallow seas in Texas there were swamps as well. So it is not surprising that one can find tree-like Lepidodendron as well as ferns and Calamites. The Annularia slab shows the leaves of *Calamites*, which are related to modern horsetails and could grow to 30 feet in height. Species of Lepidodendron grew as large tree-like plants in wetland environments. They sometimes reached heights of 160 feet with a trunk over 3 feet in diameter. They are often known as "scale trees", due to their distinctive bark covered in diamond shaped leaf-bases.



Modern Horsetail⁴



Annularia stellata ³





Archaeocidaris brownwoodensis. Brown Co.²



Crinoid cup and columnals Brown Co.²



Paleozoic Mesozoic Carboniferous Pennsylvanian MIssissippian Silurian Cenozoic Cambrian Ordovician Devonian Permian Triassic Jurassic Cretaceous 485 MYA 419 MYA 252 MYA 65 MYA 541 MYA 359 MYA 298 MYA 201 MYA 145 MYA Now

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