

The Nauplius, or larval form, of a Crustacean shows, by its having but three pairs of limbs (two besides an antennary pair), that the type is not successional to a many-jointed Annelid, but rather to some type of Rotifer.

The Eurypterids, the early form of the Limuloids, are related to Crustaceans in the number of body segments, it being 19, as in the Tetracapods; and in the fact that 13 of these 19 segments pertain to the thorax and abdomen. But the wide distinction exists that the Eurypterids have no thoracic or abdominal limbs, and the only true feet which they have are also at base mouth organs; that is, organs that pertain to the head. Moreover, as has been shown to be true in *Limulus* by Packard and others, they do not pass through the Nauplius stage in their development. These diversities and agreements appear to indicate a derivation for the Limuloids nearly like that of the Crustacean type, but probably not from Crustaceans. But since Limuloids cannot yet be proved to have existed before the Trenton period in the Lower Silurian, a derivation from some species related to the Ceratocarids is possible.

Since many of the Eurypterids were fresh-water or brackish-water species, the transfer to fresh water may have been an incident attending the divergence; and also an explanation of their attaining so great dimensions, fresh waters having been their protection. The large Eurypterids, several feet in length, would have been helpless among Sharks and Ganoids.

**8. Myriapods, Arachnids, Insects.** — Arachnids and Insects have their Upper Silurian species, but the first of Myriapods yet found are from the Lower Devonian.

The remains of Insects in the Lower and Upper Silurian, together with those of the Devonian and Carboniferous, indicate, according to Scudder and Brongniart, that Hemipteroid, Neuropteroid, and Orthopteroid species, and more or less intermediate forms, were then the common kinds. Nothing about the earlier forms of Insects is known. The existence of six pairs of wings instead of four, that is, one for each segment of the thorax, may have been a primitive feature; but this is not considered probable. The great size of some of the Devonian and Carboniferous species is a remarkable feature of the age. A spread of wing exceeding two feet is a size now existing only in large Bats and Birds.

The Neuropteroids and Orthopteroids were the predominant types; and among them were intermediate species, as has been already illustrated. The latter type as regards the family of Cockroaches, as explained by Scudder, culminated before the close of the Paleozoic. Previous to its close, the wings of the two pairs in these species were alike in diaphaneity, very nearly alike in size, and hence equally efficient as flying organs. But in the following period (as illustrated by specimens from Colorado), the anterior pair begin to show some thickening and obscuration; and in the present era nearly all the species have the anterior wings coriaceous, and fitted to serve, as in Beetles, almost solely or solely as wing covers. The posterior wings, on