A lack of backbone.

Imagine it, a world without vertebrates, where invertebrate phyla compete with each other without the interference of those nasty backboned creatures.

I was lucky enough to visit that world briefly in July 1999. With fellow S.H.W.I. traveller Doug Muir. Below is an account of some of the creatures we encountered. I have illustrated the text where possible from the drawings I made in my sketchbook during the visit.

Without competion from vertebrates a much more varied fauna was observed. Of course invertebrate faunas surround us in this world, but because of their small size and vulnerability to the more conspicuous vertebrates their presence isn't nearly as obvious as it was in this alternative timeline.

Several faunas dominate the land, forming the majority of the animals encountered. They are the arthropods, the insects, crustacea, spiders and centipedes. The molluscs with snails and some cephalopods present. The echinoderms mainly the starfish and brittlestars have colonised the land. A few other phyla represented by one or two members are also present without the pressure of competition from the vertebrates.

These pages began life as a usenet discussion on Social History What If. Mainly between Douglas Muir and myself. A mention must also go to Stan Engle who posted the original thread which sparked it all.

This page was last modified by Lewis Hutton.

Arthropods

Arthropods were everywhere, as they are in our own world. However it was not the horror world of the B movie. While many were larger than their counterparts in our own world they were not significantly so. Arthropod physiology and their reliance on spiricles and booklungs for breathing has thankfully restricted the maximum size they can achieve. As has their reliance on a chitinous exoskeleton which cannot support the weight of an animal beyond a fairly small size. Although some arthropods were unpleasantly large.

Insects were very visible, particularly because they had near dominance of the air. Some of the dragonflies achieveing huge size the largest seen had a wingspan of almost 50cm. It was almost matched by a species of moth that was quite hummingbird like in its control as it hovered sipping nectar from flowers. Beatles patroled the ground, filling the detritovore niche. The old enemy of the insects was common too, everywhere the large webs of spiders were stretched between the vegetation.

A giant centipede, this specimen was only 1 metre long. Interestingly the front four limbs of this species have become clawed. An adaptation that it found particuarly useful when feeding allowing it to be more alert than its cousins.

Centipedes were one of the least pleasant creatures that we encountered. Some of them reached 2.5 metres in length, and could be 20 centimetres wide. Unlike the insects or arachnids which only have two or three segments the large number of segmented body parts a myriapod can have means that they can be very long. They can't be very thick otherwise they suffer the same problems as those other arthropods. however they were too large for my rather squeamish tastes.

Crustaceans were the most interesting of all the arthropods we observed. The habit of crustaceans of including some calcareous structures in their exoskeletons has allowed them on average to be larger than the insects. They also have by far the most advanced respitory system of any of the arthropods, which solves several of the problems restricting the size of these creatures. Most surprising was the adaptation seen in a couple of land crab species. The exoskeleton of the limbs of those crabs had gaps allowing more efficient muscle attachment. This may be the first step in the evolution of an endoskeleton by these creatures.

Molluscs.

Despite the vast numbers of arthropods that were seen, the phyla that made the greatest impression were the molluscs. They were simply the most striking of any of the animals we saw.

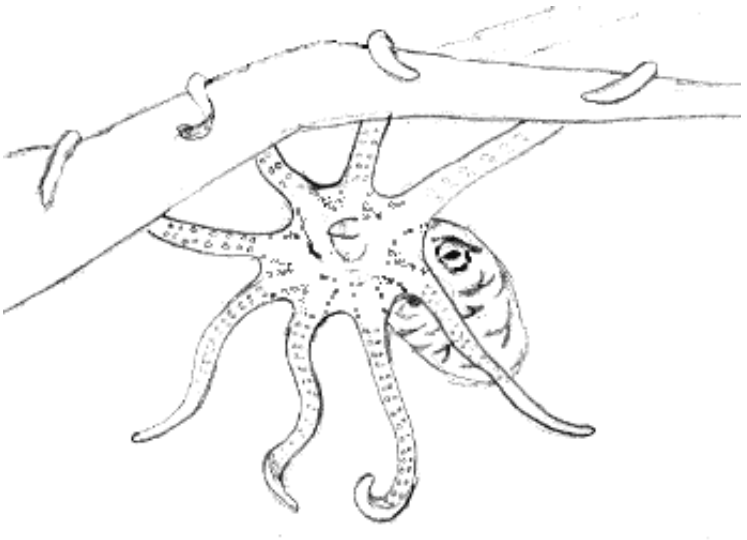
It was slugs, herds of them moving over the grasslands that I shall remember most vividly about this world. The largest ones reaching a couple of metres in length and weighing over 100 kilos. Slugs were everywhere, in the trees, on the ground, tunneling through it. There were gliding slugs that could flatten their bodies and glide between the trees. Perhaps the most interesting species was the sprinting slug. These were capable of considerable turn of speed, they would form a number of pseudopoda along the base of ther foot and would simply ripple them along their length. They could only achieve this feat over a short distance but that was all they needed because few predators could match it.

A pair of giant slugs graze peacefully near a stand of redwoods.

The gastropods are also represented by the snails, these were all much smaller than the slugs. The necessity of carrying a shell restricting their size.

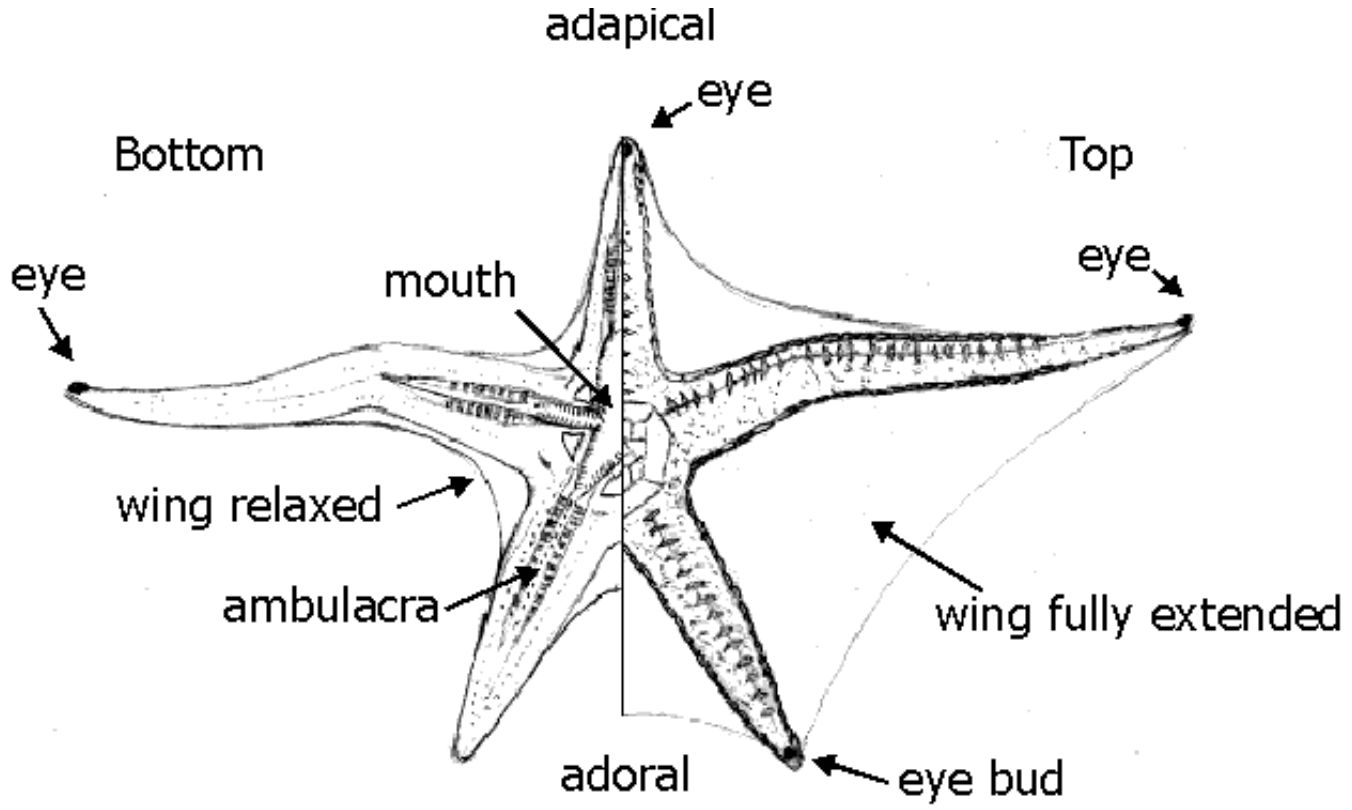
Cephalopods were also present, in the trees. Where several species of octopus were found. There they hunt slugs, insects and echinoderms

among the branches. In the sketch I made is one of the first arboreal octopi encountered. Which regarded us quizzically, a possible sign of the intelligence of these creatures.



Echinoderms

Echinoderms were an unexpected discovery. In our world these creatures are exclusively marine. While a number of species are fairly robust and can stay out of water for some time, the range of echinoderm adaptation to the terrestrial environment in the alternative world surprised us.



One of the most surprising varieties was the flying starfish. A sketch of the anatomy of one is above. The collagen like connective tissue of ecinoderms makes an astounding wing membrane. The animal's ability to change the mutability of the tissue means that it can be extremely stiff one moment and almost like liquid the next. The creature has five eyes, one on the end of each of its arms. The adapical trio of eyes are fairly acute, the adoral pair scarcely developed and are little more than light sensitive pits. The starfish can not truly fly, it is however considerably more able in the air than its gliding relatives.

Gliding starfish in a tree

Both the flying starfish and its gliding cousins are predominantly arboreal. Most of the time they can be seen hanging underneath branches, waiting for their prey, mainly flying insects. Although a couple of

species target the giant slugs droping onto their backs and feeding leech like on them. When they see their prey they drop from their branch, often using their wing membranes to guide their descent. The mutability of their wing membranes allows the creature to almost completely collapse the wing, this is a great advantage to the animal as they slowly climb back up a tree.

A number of echinoderms live on the ground as ambush predators. Hiding amongst vegetation, waiting for their prey. Both starfish and their cousins the brittlestars have adapted to this means of life. They prey mainly on the giant slugs and snails, but occasionally they attack the faster moving arthropods too. The struggle between a whipstar and a giant centipede is a fascinating sight.

The last group of echinoderms found on land are the slow moving urchins. Dome shaped creatures and herbivorous unlike their many armed relatives. They move slowly across the plains levering themselves along on a combination of tube feet

and specially adapted walking spines.

Other Phyla

Other land faunas are mainly characterised by the annelids. Most of the worms have adopted a subterranean lifestyle. Leeches and a few other annelid species are surface living creatures and agressive hunters, some reaching up to 50 cm in size.

One species of cnidaria was seen. A bizarre creature similar in some respects to the Portugese Man O' War. An aerial filter feeder capturing small midge like insects that are common near slow moving water. It reachs neutral bouyancy in the air by inflating it's air bladders with hydrogen, produced by symbiotic bacteria. It is an incredibly graceful sight to watch this creature rise slowly out of a lake in the early morning. They slowly sink again in the evening, since their insect prey are not active at night. They can very quickly release their hydrogen, should it become windy or they are attacked.