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weeks. They just flutter around and be but? terflies. But the timing of the various cycles is probably very important. Because, since the adult is the breeding part of the population, if they don't come out at the same time, they don't have any contact with each other. And you have some recent cases of certain insects which have developed what you might call chromomorphs • they are isolated by time, not by space. A sub-species or species are usually separated from each other by a barrier of some sort • water or distance or a mountain range, whatever. But these things are separated by time. Because one of them comes out in June and the other comes out in August, they never see each other. (What's the difference between a moth and a butterfly?) Actually, there isn't any. But? terflies are a super-family or sub-order of the Lepidoptera • and a small one at that. It's just very prominent because they fly in the daytime. And many of them are large and brightly coloured. Actually, there are about 20 times as many kinds of moths as there are butterflies. Butterflies usually fly in the daytime and the feelers or antennae are usually clubbed--that is, they come out and have a knob on the end. Neither of these criteria are 100 per cent because there are nocturnal butterflies and there are moths that fly in the daytime and there are moths that have clubbed antennae. Actually, there are other criteria • the wing venation, veins in the wing, and so forth. So people always ask, how do you tell the moths from the butterflies? Well, these are technical questions. How do you tell one species of elephant from another? But in this case the butterfly is considered a super family, and the skippers, which are rather different from the other fellows, are generally classified with the butterflies. But they have a hook on the end of the antennae. You know, for something so small, they are extremely complex • and we are only recently beginning to realize how complex. In the first place, they are extremely ancient. I mean, the first butterflies were in the Cretaceous, early Tertiary. The first insects are in the Carboniferous. And they were cockroaches. And you can look at the wings of them in fossils and they look just like the present-day cockroach • they haven't changed much. And this is true of all insects. You get stuff in the Baltic amber which is 40 million years old and they are Polyphemus the same species that are around today. Not in the same place, but the same kind. There are so many many insects. And one advantage of being small is that your universe is also small. I mean, there are certain insects whose total life span from egg to adult is something like three days. The adult stage is a matter of hours. And some of the May Flies, which have a long larval period, the adults have a life span of 20 minutes. (They breed and lay an egg?) They breed and they don't even lay them. They just drop them in the river. The whole body breaks apart and the eggs are spilled in the water. They don't even have any legs. They can't light. They just have wings. All the butterflies and moths are presumed to have belonged to what was known as the Panorpoid complex. Scorpion Flies are an example. They go back into the Permian. They were not very common then and became common later. But the modern order



of insects' which includes the moths and butterflies, the Caddis Flies, the wasps, the flies, and the beetles, are part of one stem. They are presumed to have come from a single ancestor. They are insects that can fold their wings. They are considered the more modern form. Whereas the May Flies, the Dragon Flies, and others which cannot fold their wings are the older form. But they are all supposed to be descended from Scorpion Flies. Scorpion Flies were mandibulatory • they had biting mouth parts as adults. They were predaceous.-They fed on other insects. And the Caddis Flies maintained this, although in other respects they are very much like moths, and butterflies. The larvae look like caterpillars but they live in the water. Many of them are plant feeding. The wings look like little moths except the wings don't have scales on them, only hairs. They are quite closely related to moths and

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