Unit 11 GeoMation: Evolutionary Process

Sometime about 3.8 billion years ago, life appears. And it starts coming up. There's new kinds appear. There's evolution going on. There's splitting of the types of things that are alive. And each of these lines represents a lineage. It's a living type, something that's alive in the world.

Now we know that about 570 million years ago, as oxygen is rising, as big critters are appearing, as shells appear, that there's this great diversification giving rise to lots of different kinds of life, which we call the Cambrian explosion. We find more and more types coming up. Each new living thing can give rise to other ones. And there's always some extinction going on, and so some of these lines don't come up to the today.

But there's quite a variety of life. Land plants appear. Land animals appear. And then we see this hideous mass extinction at the end of the Paleozoic, when most of the things on Earth died, probably because a really hot stagnant ocean is belching out poison gases that are really nasty. There's still a little debate on that.

We know that just a few things managed to get through that, and that they then are spreading, giving rise to new species in the new world. Because all the big critters were gone, there's room now for diversification. You get dinosaurs appearing and the other interesting things.

The dinosaurs are actually doing very well. They're flourishing. They are the big critters. Mammals are around, but they can't beat the dinosaurs. And then the meteorite does, so you get the great mass extinction at the end of the Mesozoic. And just a few kinds, again, succeed in getting through.

Those few kinds that manage to get through again give rise to diversity. There's space for splitting, for new types to appear. And so over 10s of millions of years, we see the rise of diversity and the things coming up to today. And so the world goes back to being a very rich, very diverse place, again with some level of natural extinction, but with a lot of splitting going on, a lot of types getting up to today.

Now, a couple of things that you may want to notice. One is that there's different types, that you come over here and you'd see something that might be mammals, or it be some subset of mammals like bears, and they will seem to be very different from some other type. And that difference arises because the split that gave rise to those types is actually way the heck down here.

And you can follow one type up to here, and you can follow the other type on up over here. And so because they came so far down in time that they split, you'll find that they look like very different types today. The other thing to notice, there's a reasonable chance that today, as we see marked right there, today may be the next mass extinction if we don't change our behavior.