EXTINCTIONS:
PAST AND PRESENT

UNIVERSITY OF CAPE TOWN

WEEK 1 THE FIVE BIG EXTINCTION EVENTS

Besides telling us about the origin and diversification of life on Earth, the discontinuities in the fossil record also tell us about the catastrophes that life encountered, the so-called extinction events. So it is very important that we all realize that extinction is a normal part of life on Earth.

No species lives forever so there's always this background extinction rate that we see in the fossil record. The background extinction rate maybe only came to twenty percent of species per million years. If you break this down even further, we see this means that 10 to 20 species out of every 100, every million years will go extinct. This is actually a very low scale and, against this background of normal extinction rates, a few more severe extinction rates stand out quite starkly. These are the five big extinction events, they are called the Big Five because these extinction events annihilate more than fifty to seventy-five percent of all living species at the time.
The first of these big five extinction events occurred at the end of the Ordovician about 443 million years ago. The second biggest extinction event occurred at the end of the Devonian, about 373 million years ago. The third one, the end of the Permian, occurred about 252 million years ago. This one is considered the biggest extinction event that ever occurred. It was soon followed by the end of the Triassic extinction event that occurred about 208 million years ago and then the last one, the last of these big five, is known as the end of the Cretaceous extinction event. This one I'm sure most of you have heard about, it occurred 65 million years ago and this is the one that ended the reign of the dinosaurs on Earth.
The most common features of the big five extinction events are that many species, more than fifty to seventy-five percent, go extinct. The extinct species spanned a wide range, there's no selectivity in terms of whether it's marine or terrestrial habitats that are being affected, and the other common feature is that they have been within a relatively short time frame which may relate to a single or cluster of causes. The other

thing about each of these extinction events, and we will see this very clearly in the lecture series, is that after each of these extinction events there is a dramatic turn over in the organisms that are present and the organisms that become dominant thereafter.