

Hello students.

This module is for SYBSc in the subject of geology.

For third semester with papertitle, Earth Dynamics and

structural geology code off the paper is GEC 103.

Name of the model is theory of continental drift Part 2.

Model number is 15.

My name is Dattaraj Jawdekar. I work as an assistant professor in Government, College of Arts, Science and Commerce, Sakshi, Goa. In this topic, we are going to see the geographical evidence for the theory of continental drift. We will also see paleontological evidence for continental drift and we will also see geological evidence for continental drift.

After this topic you will be able to understand the background of the theory of plate tectonics.

Let us look at. The evidence in support of continental drift.

Wegener presented several evidences in support of his

theory. He collected a lot of evidences from the work done

previously by other scientists. Wegener's work was also supported by a lot of. Scientists or later scientists such as Alexander Du Toit and Arthur Holmes. Following evidences were provided by Alfred Wegener and these aforementioned scientists in support of this idea of continental drift. Let us first look at the most simplest evidence and the most obvious evidence, and that is the geographical evidence. In the previous module I've talked about how Wegener got access to detailed Maps of the world, so he presented that as his first evidence.

If you look at this image. In the focus I have the Atlantic Ocean. On the left hand side I have American continents, namely North America and South America. On the eastern side over here I have African continent and towards the North I have European continent. Now, if you look at this boundary that is the eastern boundary of the South American continent, you will realize that it can fit into the western boundary of the African continent. It is just like a jigsaw puzzle.

So he said that the continents have a jigsaw fit, so that was presented as the first evidence in support of the theory of continental drift. The next evidence is paleontological evidence.

What is paleontology?

Paleontology is the study of fossils.

So in this evidence I'm going to use fossils or rather,

Wegener used fossils as an evidence for his ideas.

I will only talk about two of the most important

fossils that are mesosaurus and glossopteris.

The forces of Mrs. Soricewere found in South America

as well as in Africa, and if you know a bit of geography,

you will realize that these continents are separated by

a vast Atlantic Ocean.

Moreover, this meansOsiris was found to be

a freshwater reptile.

So. It is impossible for a freshwater reptiles such as mesosaurus to cross ocean that is as wide as

Atlantic Ocean.

So what Wegener, anotherscientist said was that these

continents were once together.

And that is the time when Mr.Sorace existed. Later, Mesosaurus got extinct, its fossils were preserved on both the continents and then the continents separated out. One went in the West direction, and one went to the East.

And that is the only way in which you can explain the presence of Mrs.Sorace on both these continents.

The next important fossil. That he talked about was glossopteris. Glossopteris is a fun. It's a plant species.

Its forces were found in SouthAmerican continent, Africa.

Antarctica, India and Australia.

Now these continents again are separated by vast oceans.

So what Wegener argued was that *Glossopteris* existed when all these continents were together.

You know where in Pangia and then when these continents separated out?

The fossil record was found on all these continents, which are now separated by vast oceans such as Indian Ocean and Atlantic Ocean.

So here is a map showing a few other forces such as *Lystrosaurus* over here and *Cynognathus* down here. You can see that *Cynognathus* was also found on these two continents. That is South America and Africa.

*Lystrosaurus* fossil was found on African continent. Its record was also found in Madagascar, India and Antarctica.

So this is all about the paleontological evidence.

The next evidence is geological evidence?

So the first thing that was observed by all those who had done tremendous and intensive field work on the African continents, was that there were several structures which terminated abruptly at the ocean.

Upon doing geological field work in the South American continent, it was realized that those abruptly terminated rocks and structures continued on the South American continent.

Another example would be Appalachian Mountains in the eastern side of United States and Canada. Those terminate at the Newfoundland, which is off the coast of Canada and USA, but they are found back or they are located again on the islands of Ireland.

Their ages seem and their structures are pretty similar.

And other geological evidence that was given was a rock sequence that was found on the continents of India, Antarctica, Africa, Australia and South America. This rock sequence.

Head. Publisher Delight that is a Boulder bed at the base.

This was stopped by.

Or sedimentary sequence including sandstones, shales, and coal. And on top of this.

We had a layer of lava flows.

So this sequence that I just talked about was found on all the continents.

But whatever lies about this sequence was different on all

the continents. What was argued was that the bottom sequence of those three rock types formed when all the continents were together. And when they separated out, they were topped by a different lithologies.

So in this image you can see various cretanes which terminate at the South American continent and they reappear on the African continent. If you see here this Portion is something called as Shield area. It ends at the Atlantic Ocean. Now AtlanticOcean will not be shown here because it was closed. At that time, but you can see that a little trace of rock that has same age is found on theSouth American continent.

Similar examples can be found at here and here.

In the next models we will see more evidences that were given in support of the theory of continental drift. This was part one.

And for this I've referred to the Earth dynamic systems by Kenneth Hamblin and Holmes' principles of physical geology by Arthur Holmes.

Thank you.