



Gea Norvegica Geopark

In English



Rognstranda

A beach between
two worlds



United Nations
Educational, Scientific and
Cultural Organization



Gea Norvegica
UNESCO
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*Rognstranda – summer paradise
and geological phenomenon*

ROGNSTRANDA – A Geological Divide

At Rognstranda beach you can wander over 1 billion years of geological history in just a few minutes. Two entirely different geological worlds, separated by only a little bay; this is what you meet at Rognstranda.

Just have a little look around and it is obvious! On the one side, there is a relatively flat polished ice-carved bedrock of old gneisses, while on the other side a cliff towers overhead, made of layer upon layer of limestone. The origins of these two types of bedrock are just as dissimilar as the landscapes.

The glacially-polished bedrock consists of ca. 1500 million year old gneisses from the Precambrian. These rocks were formed deep down in a mountain chain, where they were kneaded and partially melted, before they again cooled and hardened into the metamorphic rock type gneiss. (cont. last page)

An "unconformity" - what is that?

The gneisses in the foreground of the photo above have a vertical structure. The limestones and shales in the steep cliff in the background lie horizontally. This kind of discontinuous boundary between two rock formations is called an «unconformity», and

at Rognstranda the age difference between the rock layers below and above is over half a billion years. This kind of boundary shows that something geologically very important has occurred. The two sides of this bay belong to two entirely different geological worlds.

ONE BAY - TWO GEOLOGICAL WORLDS

The shales and limestones on the eastern side of the bay are "only" ca. 500 million years old, and were formed during the time periods known as Cambrian, Ordovician and Silurian.



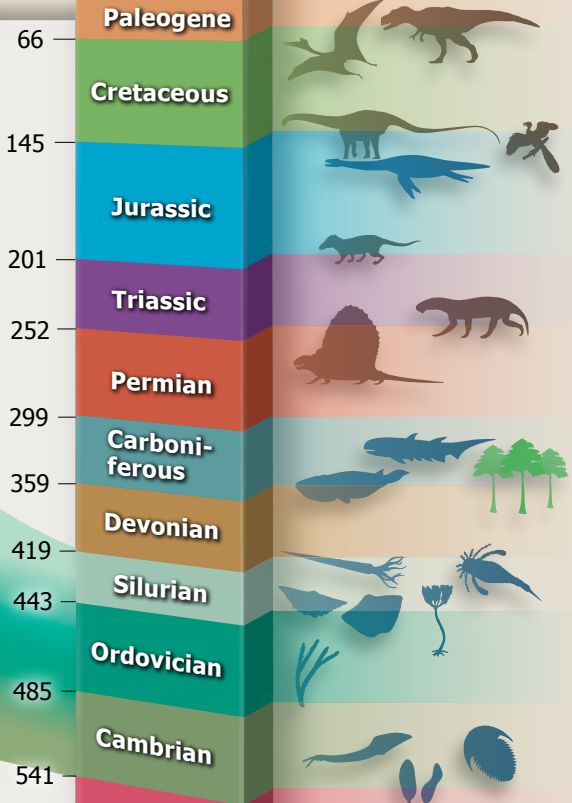
Ca. 500 mill. years



The gneisses that make up the smooth rounded rocks on the west side are 1100–1500 million years old and were formed during the geological time known as the Precambrian.



ca.1000



Pre-cambrian

Examples of life forms from the geological time periods.

Even though one can find trace fossils made by the earliest land animals already in the Ordovician, the Cambrian, Ordovician and Silurian Periods first and foremost belong to the Age of the Ocean.

(Blue coloured life forms indicate that these lived in the sea).

On the other side of the bay is the limestone cliff, ca. 500 million years old, from the time periods known as Cambrian, Ordovician and Silurian.

These limestones were formed in a shallow tropical sea when the geological plate that Norway sits on was south of the equator. There was abundant life in the sea, with primitive squids, trilobites, brachiopods, corals, crinoids and bryozoans. Most of these had shells of calcium carbonate, and after they died and sank to the bottom they formed layer upon layer of carbonate ooze, which mixed with clay and sand became compacted into the rock type limestone.

We can of course also find fossils of these extinct organisms in the limestone.



Once sea floor in a shallow sea, now a steep cliff overlooking Rognstranda.

Calcareous pine forest on rocky shelves

This type of natural landscape characterized by limestone cliffs is typical for the Grenland area and is a result of ca. 250 million years of erosion. The cliffs are called «flauer» locally. At the top of several of these «flauer», including the one at Rognstranda, we find protected areas of calcareous pine forest. Calcareous pine forest generally grows where there is limestone bedrock.

Limestone weathers easily and supplies minerals and nutrients to the soil as it disintegrates. Due to this and the acidic carpet of needles that falls from fir trees this area has an unusual vegetation with high species diversity. Among other plants, a rare species of orchid grows on the calcareous forest floor.

A shallow, tropical sea from 400-500 million years ago gave rise to the eastern ridge of Rognstranda.

The photo collage is based on a model by John Klausmeyer, Exhibit Designer, University of Michigan, Museum of Natural History ©.

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