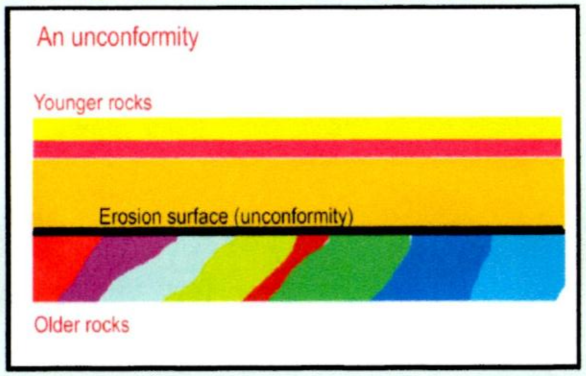
due to a change in the source rock or a change in environmental conditions at the time of formation.



Locality 6

When you come to the wooden gate, follow the path to the high ground that can be seen in the woods. This is an old sea cliff and it's made of the same sandstone and conglomerate layers that are found on the beach. But what's a sea cliff doing so far away from the sea?
A few thousand years ago, these cliffs were at the edge of the sea. However, since then, the sea level has fallen relative to the land and now the cliffs are more than 200 metres away from the present shoreline. The lower section of the cliff is concave because of the erosive power of the waves that once pounded against it.

The flat ground between the base of the cliff and the present shore is called a raised beach because, although it once was the beach, it now lies above sea level. This could have been as a result of the lowering of global sea level or of a rise in the land surface in this part of Scotland.

How to get there:

Ardmore point is 2 km north-west of Cardross near the main A814 road from Dumbarton to Helensburgh. A minor road leads south-west from Lyleston Cottage, crosses the railway and continues to the shore of the Firth of Clyde, where there is a car park.

UKRIGS GEOCONSERVATION ASSOCIATION

SCOTTISH NATURAL HERITAGE

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What does RIGS mean?

RIGS stands for a Regionally Important Geological Site which has been notified to the local planning authority.
It is a landscape, landform or rock feature identified by a local voluntary group as having particular value for education and tourism.
RIGS are currently the most important places for geology and geomorphology outside statutorily protected land such as Sites of Special Scientific Interest (SSSI). The designation of RIGS is one way of recognising and protecting important Earth Science and landscape features for future generations to enjoy.
The Strathclyde RIGS group is a part of the Geological Society of Glasgow. If you would like to join a small group of dedicated amateurs and professionals to continue this work, then please contact:

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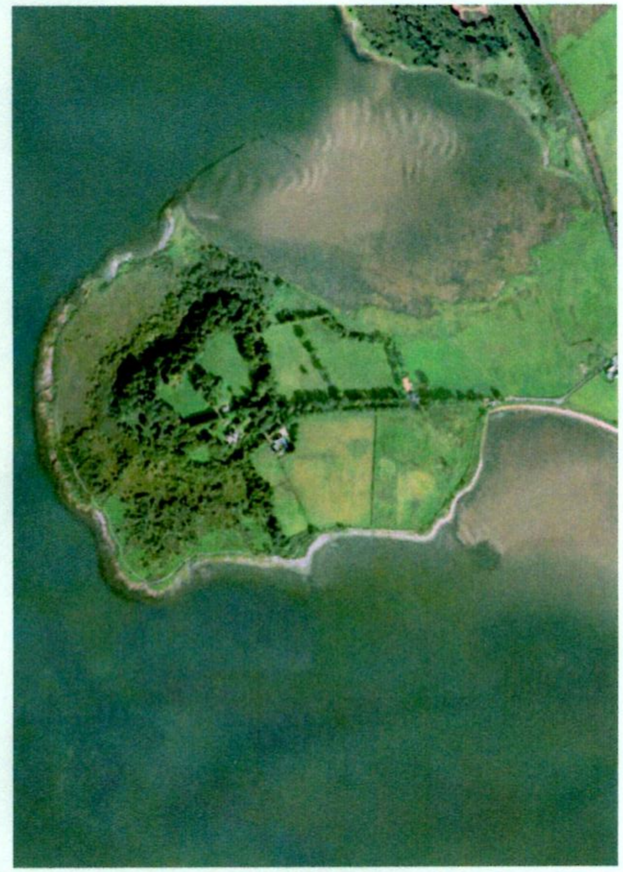
The Geological Society of Glasgow
Division of Earth Sciences
Gregory Building
University of Glasgow
Glasgow
G12 8QQ

e-mail: strathrigs@postmaster.co.uk

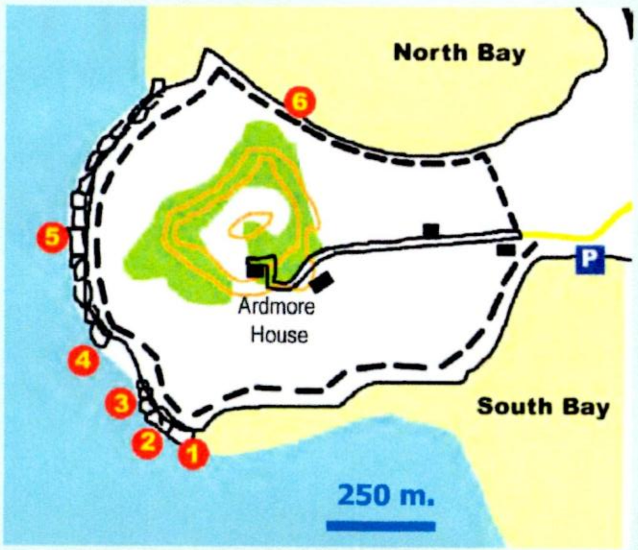
The Geology of Ardmore POINT



A Geological Trail near Helensburgh

Strathclyde RIGS

375 million years ago, when the rocks of Ardmore Point were formed, the area was a desert just south of the equator. The climate was arid, with great variations in rainfall leading to flash floods.
As the great mountain chain to the north eroded, huge river systems carried away these erosion products and deposited them on the flatlands to the south.



Locality 1

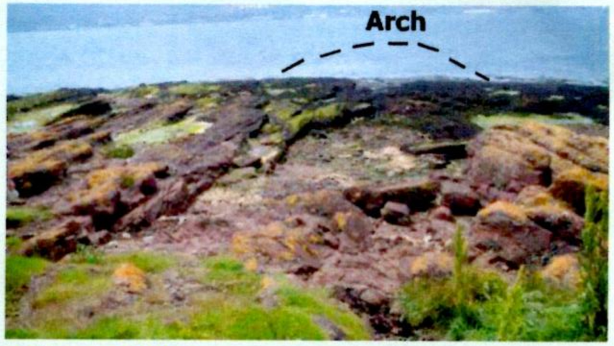
If you observe the rocks on the foreshore you will see that they are made of two distinct layers. One layer is a red fine-grained sandstone; the other is a pebbly layer that geologists call conglomerate. Because both of these layers are present, we can tell that the area was subject to large variations in rainfall. In times of heavy rainfall, the rivers flowed much faster and were able to move larger pieces of rock downstream to form the conglomerate layers. When there was little rainfall, the rivers only had enough energy to move the small grains that make up the sandstone.

Have a look at the pebbles in the conglomerate; are they all the same?
The pebbles come from different sources. The dark green pebbles with shiny layers of the mineral mica come from rocks called schist. The mountains to the north of you are predominantly schist. The white or pink pebbles are quartz and come from quartz veins within the schist. There are also some dull grey pebbles with small white crystals; these are volcanic in origin.

When these layers were formed they were horizontal. Are they horizontal now?

Locality 2

If you stand at the back of the bay and look out to the river, you will see that the layers in the rocks to the left of you dip down to the left, while the rocks to the right dip down to the right. Compressional forces within the Earth's crust have, over millions of years, folded these horizontal layers into an arch called an anticline. The continual processes of erosion have eventually worn away the top of this arch.

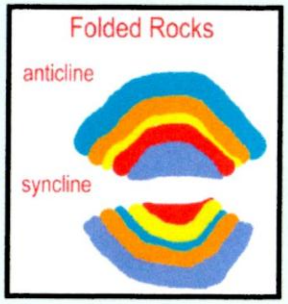


Ardmore anticline

Locality 3

Here you see the layers are dipping down towards the centre of the bay to form a 'u' shaped fold that is called a syncline.

These types of structures form over millions of years. The rocks deform very slowly as the crystal structure of the minerals breaks and reforms in response to sustained compression.
But not all structures in rocks are so slow to form!



Locality 4

Follow the path till it crosses a small stream. You will now be in a narrow bay with a low rock face on its right side. Look at the layers on this rock face. Can you see them on the left of the bay?

Ardmore fault plane

Here a rapid, brittle earth movement called a fault has fractured the rock. When there is movement along a fault, the land on either side of it moves in different directions. In this case the land on the left has dropped relative to the land on the right. The rocks that you see exposed on the rock face to the right are now hidden beneath the present land surface on the left side of the photograph.
Finally, on the section of the rock face near the path, you can find parallel scratches called slickensides that formed as the rocks were forced past each other.

Locality 5

As you walk further, you will come to a bay where the rocks undergo a change in colour. The ones on left of the bay are dark, red/purple; the rocks on the right, which are younger, are a much brighter red. In this case, this colour change marks what geologists call an unconformity. An unconformity marks a period in time when no rocks were being deposited (formed). When deposition resumed the rock formed was a brighter red. This may have been