

# Hutton's Unconformity

This short walk takes you to one of the most historically important geological outcrops in the world. The observations that James Hutton made on Arran were crucial to forming a modern understanding of geology and the age of the Earth.

**2 Carboniferous sandstones**  
So far, the rocks you have been walking over have been the grey Dalradian schists. At this point they are very steep – almost vertical. Ahead of you, you can see layers of brown Carboniferous sandstone, which are sloping gently towards the sea. It is this difference in ‘dip direction’ that shows an unconformity is nearby.

**3 Hutton's Unconformity**  
James Hutton was an eighteenth century Scottish geologist who visited Lochranza in 1787. At that time it was thought that the Earth was around 6,000 years old. He noticed that the gently-sloping sandstones lay directly on top of the steeply-dipping schists. It is this contact between the two that is the famous ‘unconformity’. He reasoned that such a structure must have taken millions of years to form.



Hutton's Unconformity is the junction where Dalradian schists meet Carboniferous sandstone.



These rocks have been deformed and folded by tectonic processes deep in the Earth.

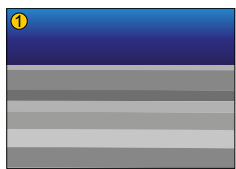
**1 Folded Dalradian schists**  
The Dalradian schists are the oldest rocks on Arran. They were formed as sediments on the ocean floor around 540 million years ago. As tectonic plates collided, they were metamorphosed and deformed by intense heat and pressure deep within the Earth. On the shore here, you can see how much they have been folded. Imagine the pressures involved in deforming these solid rocks like toffee!

From his observations on Arran, Hutton showed that the Earth must be a great deal older than previously thought, and introduced the concept of ‘deep time’ to the scientific community.

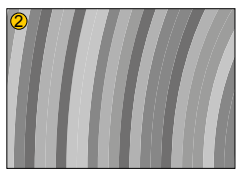
The events that occurred in the formation of the unconformity are shown below.



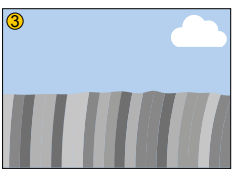
## The story of Hutton's Unconformity



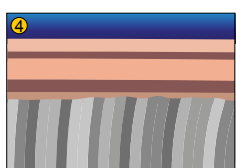
**1** 540 million years ago, sediment was deposited in an ocean and compacted to form sedimentary rock.



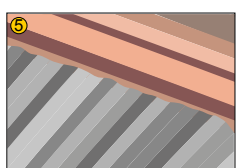
**2** Collision of tectonic plates caused immense heat and pressure, which folded and tilted these rocks.



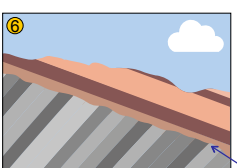
**3** As the landscape eroded away, these rocks were brought to the surface.



**4** 350 million years ago, this landscape was covered by a shallow sea. More layers of sedimentary rock formed on top.



**5** Once again, these rocks were tilted and uplifted to the Earth's surface.



**6** Erosion at the surface has shaped the outcrop into what it looks like today!

Unconformity

