

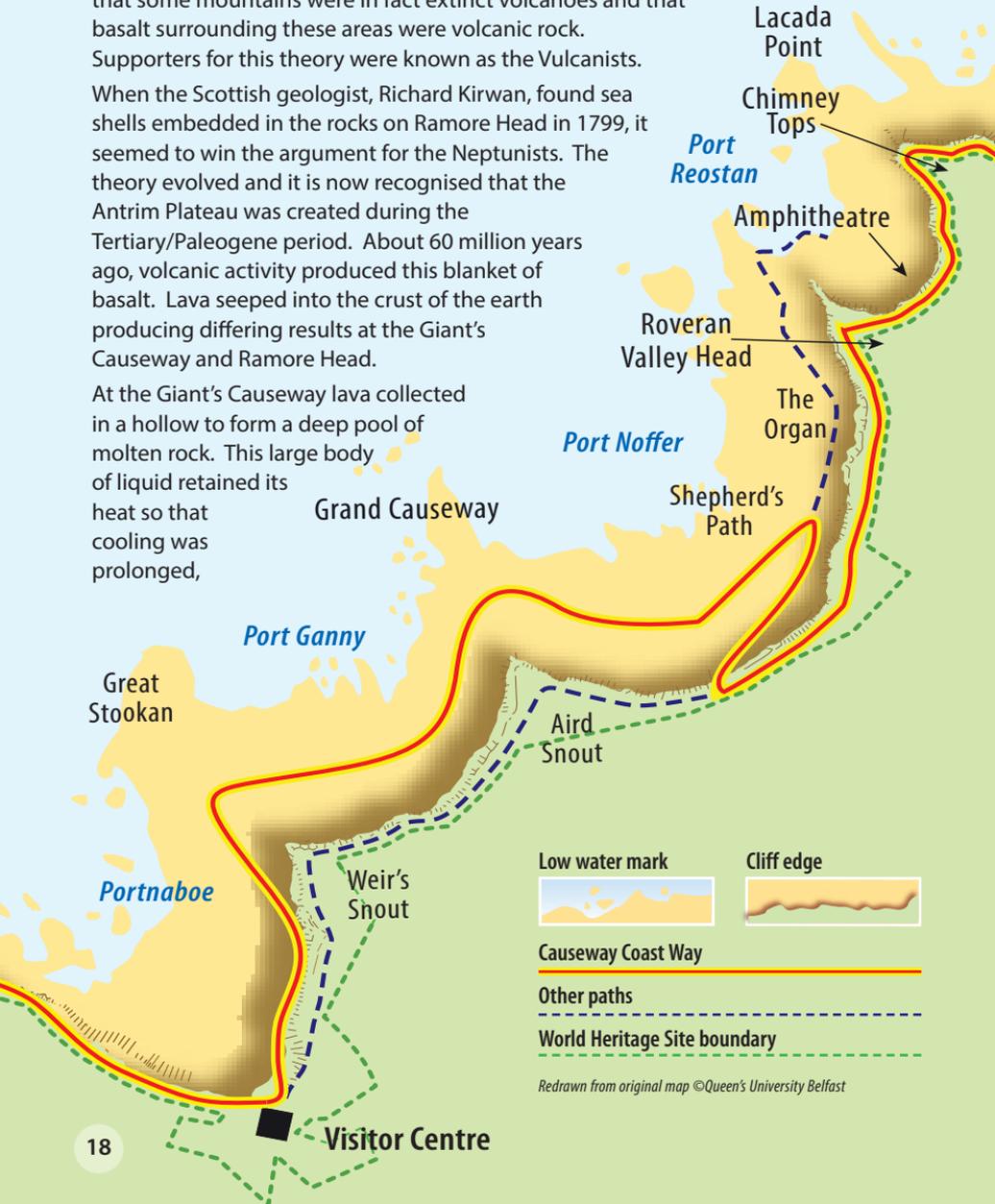
2 2.1 The Giant's Causeway

The 'discovery' of the Giant's Causeway was announced to the Royal Society in 1693 amid heated debate about whether it was manmade, natural or created by a giant called Finn McCool: see panel on page 19. Since the end of the 17th century, debate over the Causeway's origins continued worldwide for over a century. Central to the riddle was the question of how basalt was formed.

The original belief was that the stepping stones which emerge from the sea were formed by dead matter being deposited on the ocean floor. Those who supported this argument were known as Neptunists. In 1771 French Geologist, Nicholas Desmarest, put forward the contrary theory that some mountains were in fact extinct volcanoes and that basalt surrounding these areas were volcanic rock. Supporters for this theory were known as the Vulcanists.

When the Scottish geologist, Richard Kirwan, found sea shells embedded in the rocks on Ramore Head in 1799, it seemed to win the argument for the Neptunists. The theory evolved and it is now recognised that the Antrim Plateau was created during the Tertiary/Paleogene period. About 60 million years ago, volcanic activity produced this blanket of basalt. Lava seeped into the crust of the earth producing differing results at the Giant's Causeway and Ramore Head.

At the Giant's Causeway lava collected in a hollow to form a deep pool of molten rock. This large body of liquid retained its heat so that cooling was prolonged,



Low water mark



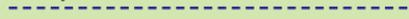
Cliff edge



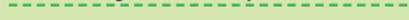
Causeway Coast Way



Other paths

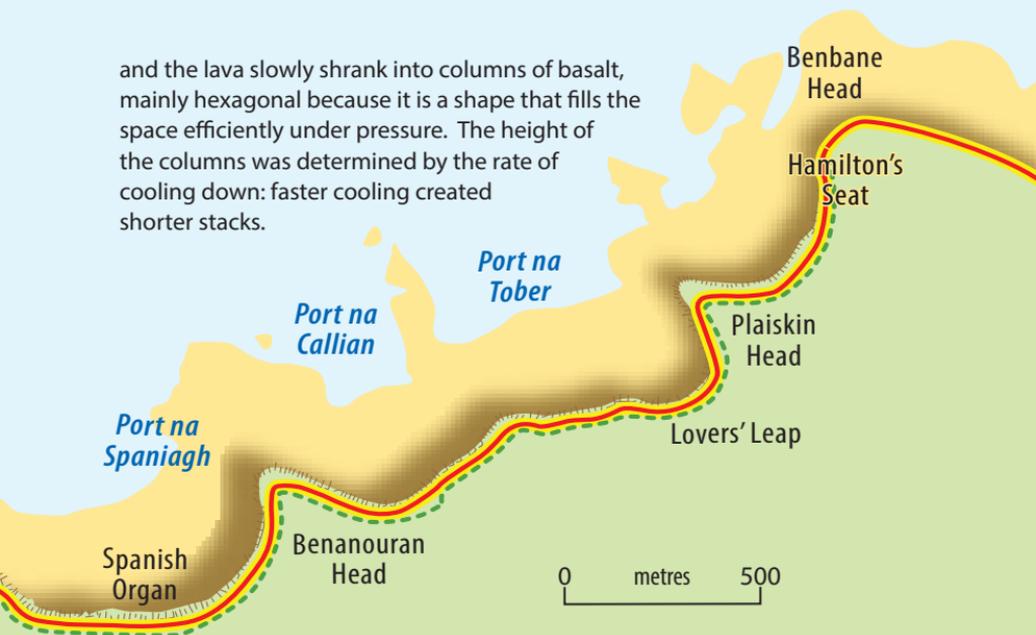


World Heritage Site boundary



Redrawn from original map ©Queen's University Belfast

and the lava slowly shrank into columns of basalt, mainly hexagonal because it is a shape that fills the space efficiently under pressure. The height of the columns was determined by the rate of cooling down: faster cooling created shorter stacks.



Several miles away at Ramore Head, this same volcanic activity saw the lava being injected into cracks of sedimentary rock, formed originally on the sea floor. This shale was then baked into a harder rock now known as hornfels.

The hexagonal columns of the Giant's Causeway are not unique: similar formations are found 80 miles away in Scotland (at Fingal's Cave, Staffa) and further afield, in Australia, Germany, India, Patagonia and Vietnam. However, the Giant's Causeway has columns in impressive numbers, and in a grand situation to which people have easy access. In 1986, the UNESCO

World Heritage Site citation referred to 'superlative natural phenomena' and 'an outstanding example representing a major stage of earth's history'.

Beyond the central causeway area, the UNESCO site extends along 5 km (three miles) of coastline from Benbane Head to Portnaboe. This larger area contains many subtle features which show how repeated volcanic activity has shaped the landscape.

Just above sea level between Port Noffer and Port Ganny are the Grand, Middle and Little Causeways which contain about 38,000 columns in total. Whilst most columns have six sides, many of the hexagons are far from regular, and other columns have anywhere from four to eight sides. Apparently, there is one with only three sides: good luck if you can find it.

The legend of Finn McCool

Finn McCool (Fionn mac Cumhail) was a legendary giant who lived on a headland of Antrim. Never having met his rival Benandonner, he rashly challenged the Scottish giant to a fight. Because there were no boats big enough to carry either giant, Finn built a causeway across the sea to Scotland. When Finn saw Benandonner crossing the bridge, he took fright at the size of him and ran home. His wife Oonagh wrapped him in a blanket and he pretended to sleep. Benandonner arrived at the house and demanded to see Finn, and Oonagh said he was coming shortly, but asked him to keep his voice down so as not to wake their baby. Benandonner looked down at the giant 'baby' and ran away in fear of meeting his father. On his way back to his cave in Scotland, he ripped up the causeway behind him.

The Onion Skin Rock feature lies mid-way between the main Causeway and the Visitor's Centre, at the Windy Gap. It shows the effects of spheroidal weathering: water enters gaps between the columns of stone and expands when it freezes. The rock eventually peels away in layers, like the skin of an onion.

The Chimney Tops are elongated columns in a small cluster which display the durability of basalt. The columns have become isolated while the cliff-face which once surrounded them has gradually eroded away.

Beneath the Chimney Tops is a distinctive band of red rock separating the layers of basalt. During a tropical period, vegetation helped create a soil over the rock. This was then baked by further volcanic activity to create the igneous rock known as *laterite*.

Grand Causeway with Chimney Tops in background



The Giant's Organ is an impressive wall of exposed basalt columns within the cliff face.. Some columns are up to 12 metres tall, with horizontal cracks where tensions in the cooling process created fractures in the rock.

Giant's Organ

*Inset:
The Chimney Tops*





North over the basalt columns of Grand Causeway

Hamilton's Seat is on top of the cliffs at Benbane Head, named after geologist Reverend William Hamilton. Once a frequent visitor to the Causeway, he carried out a survey of the basalt fields to create a geological map of Antrim in 1786.

Other geology

The white cliffs of Antrim go back further into geological history than the Giant's Causeway. Chalk cliffs, such as those found on Kinbane Head, Larrybane, Ballintoy, White Rocks and Rathlin Island were all originally formed during the Cretaceous period between 65 and 145 million years ago. Skeletons of microscopic organisms called coccoliths built up over time on the ocean floor and became compressed to form chalk. This eventually was pushed up to form part of the mainland, bringing the embedded fossils with it.

The warmer climate of previous eras was interrupted by several Ice Ages over the last two million years. Advancing glaciers from Scotland helped to sculpt the pre-glacial Glens of Antrim. When the last Ice Age ended, about 13,000 years ago, it revealed such features as the classic U-shaped valley of Glenariff. After the massive glaciers, many miles high, finally melted, they released the extreme pressure on the land below, and the land lifted, creating many raised beaches along the Antrim coast. There's a fine example at Ballintoy, where groups of sea stacks now stand beyond reach of the sea.

Elephant Rock at the east of White Park Bay

