

Hutton's Unconformity at Siccar Point

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Revised October 2026



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Siccar Point, about 4 km east of Cockburnspath, is undoubtedly the most famous geological location in the area. More has probably been written about this location than all the other sites in the area combined. It has been included in the previous Lothian geology guidebooks, despite not being in the Lothians!

Facilities for the casual visitor and geological enthusiast alike have recently been hugely improved by the opening in 2026 of the 'Deep Time Trail' to mark the tercentenary of the birth of James Hutton (1726-1797), the father of modern geology. The trail leads from the access road to a cliff top overlooking the site. See <https://james-hutton.org/deep-time-trail/> for more information.

Access to the rocks themselves is still via a steep and often muddy 'path' down a grass slope, with an uninviting drop below. While accessible by the confident, many visitors will choose to view the site from above – binoculars are useful. The view from the top of the cliffs is worth a visit in any case. There is plenty to see at any state of the tide.

Previous field guides include long quotations from Hutton and Playfair. These can be read in Craig in McAdam & Clarkson (1996), available on the [Geoguide website](#).

The exposures are protected as a Site of Special Scientific Interest (SSSI) and on no account should hammering or other alteration of the site be undertaken.

1. Start of Deep Time Trail (DTT)

The trail starts on the private road that leads to the premises of the ESG Drysdale vegetable production company located in an old quarry.

There is a level parking area on the right side of the road [NT 8013 7052], nearest postcode TD13 5AA. Please do not park on the left, as this blocks the lay-by and farm access. There is plenty more parking at the roadside further along the road.

The trail is well sign-posted with information points (Figure 1). At each stop, visitors can download audio and video clips, including interviews with experts, geopoetry and music, that delve into the story of James Hutton and Siccar Point.



Figure 1: The first information point on the Deep Time Trail.

2. Deep Time Viewpoint

The DTT has a viewpoint over the cliffs to the exposures themselves [NT 8114 7089]. Those with little head for heights may recall Playfair's famous quotation about the 'abyss of time', and should remain well back from the void. The new stone viewpoint structure includes seating, a 3D model of the unconformity and interpretation panels (Figure 2).



Figure 2: the Deep Time Viewpoint

From the cliff top, the wave-washed rocks below show steeply dipping greywackes and shales of Lower Silurian age (ca. 430 Ma, Aldridge et al., 2002) partly covered by gently dipping red breccia and sandstone of Upper Devonian age (ca. 370 Ma, Browne et al., 2002), so representing a time gap of approximately 60 million years (Figure 3). This is the product of uplift and erosion of the Caledonian Mountains producing what may be the world's most celebrated unconformity.



Figure 3: The view from the viewpoint, people for scale (lower right).

The wider landscape neatly demonstrates why James Hutton and his colleagues came to this coast to search for an unconformity. To the east, the Silurian rocks are visible in high cliffs towards Fast Castle. To the west, the landscape is more gentle with lower cliffs of gently-dipping Devonian sandstone, with good quality agricultural land and the chimneys of the Dunbar cement works, processing Carboniferous limestone, in the distance.

Other geological features visible from the viewpoint include the Bass Rock, which is a phonolite volcanic neck hosting the world's largest colony of northern gannets.

3. East Viewpoint

It is well worth continuing to the east viewpoint [NT 8120 7064] which gives a good view of the unconformity which is here fairly planar. Bedding in the Silurian greywackes below the unconformity is close to parallel with the cliff, making it a little tricky to pick out (Figure 4). An information point gives some geopoetry and encourages contemplation of the impact that James Hutton's work had on our understanding of the world, and our place in it.

Looking into the bay to the east, at low tide the wave-cut platform can be seen to be Devonian red beds. A small fault drops the unconformity down to the east, but the fault plane is difficult to access.



Figure 4: The unconformity from the east viewpoint.

4. Siccar Point

Return to the Deep Time viewpoint and walk c. 50m to the west along the cliff top. A very faint path leads diagonally right down the grassy slope to a small level platform, and a better-defined path continues diagonally down to the rocks. It is not advised to follow the fence (topped by barbed wire) which runs from the east of the view point, as this encourages use of an old rope whose safety must be very questionable indeed.

On the rock platform [NT 8125 7095] the red Devonian rocks can be seen to include layers of breccia and sandstone (Figure 5). The unconformity surface is sharp (Figure 6) with a few partly in-situ fragments of the greywackes in places and localised fractures infilled with red sediment. The greywackes young to the west-north-west and are locally stained red below the surface, presumably from weathering in the arid Devonian climate.



Figure 5: almost vertical greywackes (foreground) overlain by red Devonian sediments.

The breccia clasts are composed entirely of greywacke, in a sandy matrix. Well-developed imbrication gives a paleo-flow from the north or north east, so onshore and uphill with the present landscape (Figure 7). The overlying sandstones are very difficult to obtain a paleo-flow from, though are presumably being transported in the same direction. Both facies represent floods which were probably very sporadic.



Figure 6: The unconformity surface with overlying red sandstone

The unconformity surface is conspicuously not planar, with the sandier beds of the greywackes more resistant to (Devonian) erosion than the intervening shales. In addition, the surface is lower in the centre of the exposure than the top – even the system of natural fissures that cut the exposure in the intertidal zone do not reach down to the unconformity surface. The Devonian sediments are clearly in a paleo-depression, usually described as a wadi.



Figure 7: imbricated clasts with paleo-flow to the right.

For an interesting view of the geometry of the unconformity surface, clamber with care to the west end of the exposure and look westwards into the cliffs. Beyond the wadi that forms the majority

of the exposure, the unconformity surface can be seen to be fairly planar, but with an additional small wadi cutting down into the Silurian strata (Figure 8).



Figure 8: A small wadi cut in the unconformity surface to the west of the main exposure.

The only practical return is by the outwards route.

Acknowledgements

The writing of this guide was supported by a generous donation to the Edinburgh Geological Society by the late David Young, for which we are grateful.

The Scottish Geology Trust, the Edinburgh Geological Society and The James Hutton Institute raised £175,000 of funding for the Deep Time Trail: this included a successful crowdfunding campaign that attracted over 600 individual donations, and generous funding from the Cockburnspath & Cove Community Fund. A big thank you to all who contributed, and the volunteers who supported the fund raising and construction of the Deep Time Trail.

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