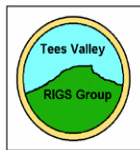


ROSEBERRY TOPPING GEOTRAIL

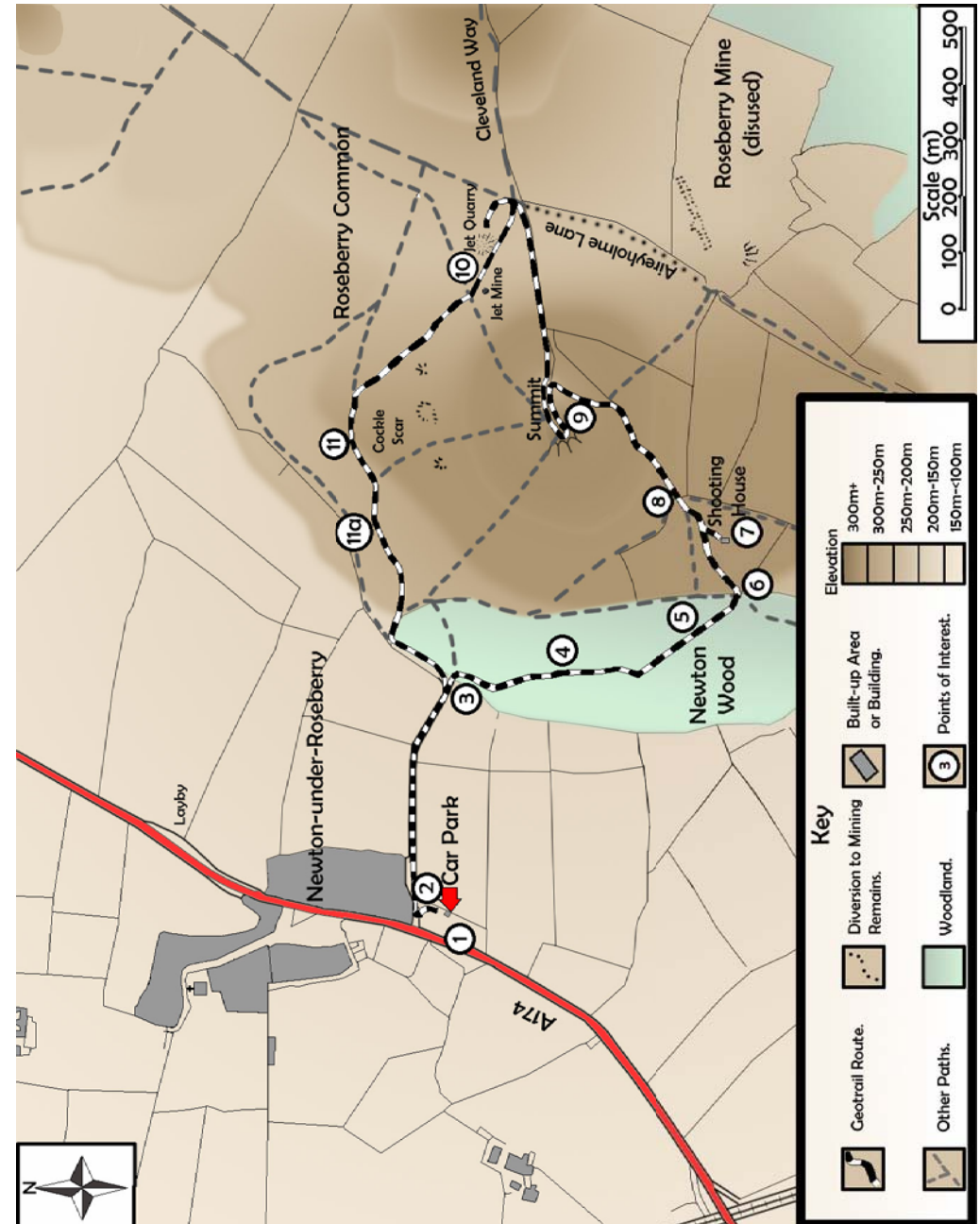
Distance 2.5 miles (4 km)
 Ascent 215 m (705 feet)
 Time 2 to 3 hours
 Map O.S. Explorer Leisure 26
 North York Moors (West)

This is a super way to climb the hill and enjoy the panoramic views. The trail lets you catch your breath at a number of stops where you can see features of geological interest. You can imagine that you are climbing through time. Every step up that you take represents something like 5,000 years. The terrain is rough and the summit airy. It can be hazardous, especially in rain, ice and snow. Please take care. Read the safety and conservation notices on page 5.



Tees Valley Wildlife Trust is a registered charity. No. 511068

Roseberry Topping Geotrail produced by Tees Valley RIGS Group, www.tvrigns.org.uk



Geotrail Route Map

LOCAL GEOLOGY

Key features

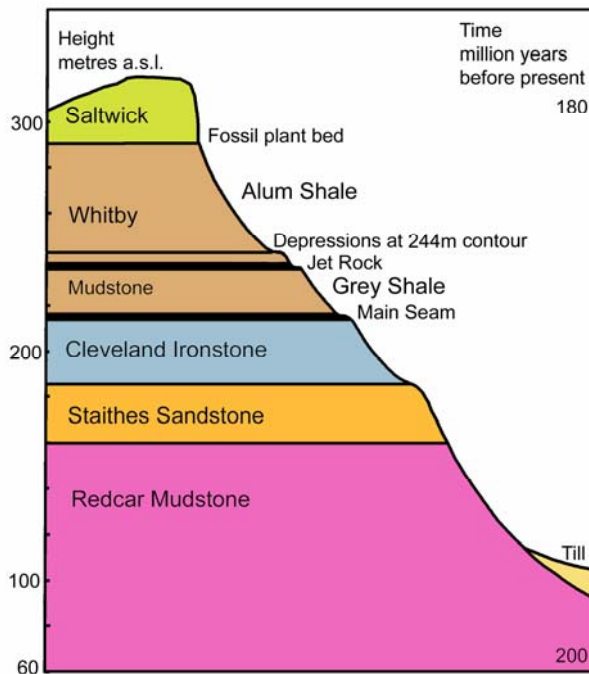
- **Jurassic rocks and fossils**
- **A classic isolated hill (outlier)**
- **Landslips**
- **Old mines, quarries and spoil heaps**
- **Panoramic views**

The rocks of Roseberry Topping were laid down during the Jurassic period, 200 to 180 million years ago, at first as sediments on the floor of a warm sea and, later, forming a huge delta where dinosaurs roamed.

From around 65 million years ago, the time of the demise of the dinosaurs, the area was uplifted and thousands of metres of strata were gradually eroded away. The hill owes its isolation as an outlier to this action by water, ice and wind over millions of years when the Tees Plain and the escarpments of the Cleveland Hills were also formed.

In the last 2 million years huge ice sheets covered the ground and left behind superficial deposits such as till (boulder clay).

Finally, the steep slopes have been subjected to extensive landslipping.



THE JURASSIC SUCCESSION

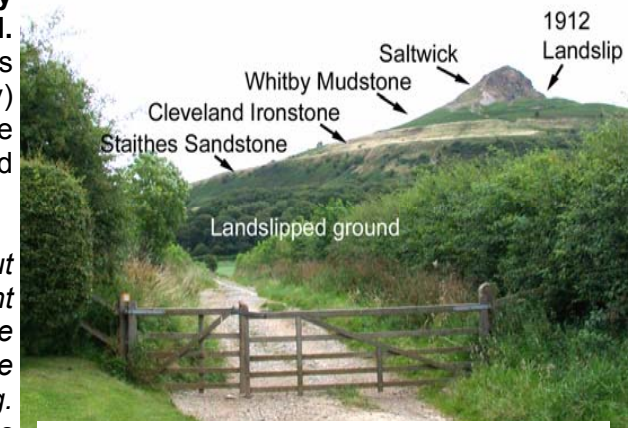
Jurassic Formation details

Unit	Rock type	Environment	Comments
Saltwick	Channel sandstone	Deltaic	Plant bed at base
Dogger	-	-	Locally absent
Whitby Mudstone	Alum Shale	Mudstone	Marine
	Mulgrave Shale	Thinly laminated mudstone	Deep, poorly oxygenated, marine
	Grey Shale	Mudstone	Deep marine
Cleveland Ironstone	Ironstone beds and shales	Shallow (shoal) marine	Includes the 'Main Seam', a major iron ore
Staithes	Sandstone	Shallow marine	Bench feature
Redcar	Mud- and siltstones with thin limestone and ironstone beds	Marine, off-shore	-

ROUTE DETAILS

1, Newton under Roseberry Car Park, 105m (345ft) a.s.l. (m/feet above sea level). This is located on till (glacial clay) with the Redcar Mudstone Formation forming the solid rock below.

► Walk along the footpath out of the car park and turn right (east) on the lane to a gate nearby where there is a fine view of Roseberry Topping. The origin of the name has



The view from stop 2

been studied by many antiquarians Ψ (This sign indicates that further information is available in 'Geotrail Extra').

2, Gate. You can clearly see the step-like form of the hill that results from differential erosion of the harder (sandstone and ironstone) and softer (mudstone) layers. High up, the capping of harder Saltwick Sandstone is clearly evident with the near vertical cliff, the result of a rotational landslide. Also notice the slight easterly inclination of the strata.

► Follow the track (Roseberry Lane – often muddy but in places with a well-macadamised surface of whinstone) to the kissing gate marking the entrance to Newton Wood.

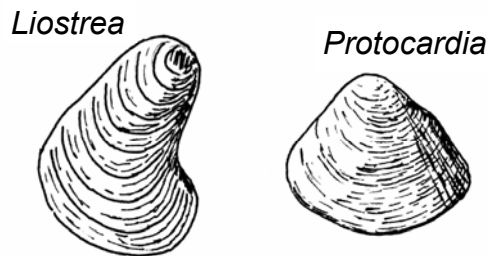
3, Kissing gate. About here you pass on to landslipped ground formed of Redcar Mudstone.

► Turn right (south) along either one of the two paths (that soon rejoin) to reach a shallow valley.

4, Valley clearing. This is part of the toe of a much eroded landslip. It is covered in bluebells during late spring.

► Follow the left hand path through the woods that rises and steepens alongside the east facing slope to where (not far from the top at about 185m (610ft) a.s.l. there are sandstone cliffs above you and the path crosses small sandstone exposures (note that this path is not shown on the O.S.map).

5, Sandstone on path. The steep scar is formed of the Staithes Sandstone. There is a small cliff of thinly bedded, shallow water sandstone that contains lenses rich in the casts of bivalves, particularly cockles (*Protocardia*) and oysters (*Liostrea*). The fossil casts can be easily seen in loose rocks beside the path Ψ .



Staithes Sandstone bivalves

► Continue up the path to a kissing gate and into a field.

6, Kissing gate. This is your first sight of the summit since entering Newton Wood. The shooting box is also in view directly above you.

► Go up the gully on to a 'terrace' to reach the stone-built shooting box.

7, Shooting box/ Summer house, 220m (722ft) a.s.l. (half way up). The 'terrace' is close



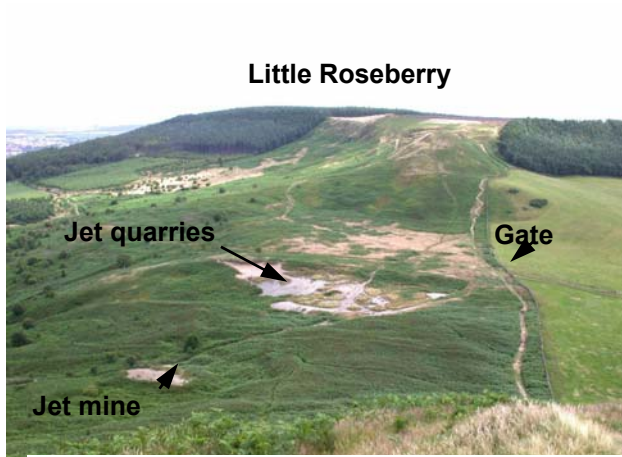
to the top of the Cleveland Ironstone Formation. There is a good view from here of the landslipped face of the Topping and the boulder field below it Ψ . The fall took place in 1912. The shooting box was built in the 18th Century as a sort of poor man's version of the Rievaulx terraces, the 'terrace' being partly of made ground.

► Cut across towards the summit to the kissing gate at the corner of the field.

8, Kissing gate. This is the level of the Main Seam of ironstone. Past quarrying activity is evident from the tumbled nature of the ground and was probably for the terrace on which the shooting box stands as well as, later, for ironstone Ψ .

► Follow the engineered, roughly stone-laid path constructed of Jurassic sandstone. This was flown in by helicopter in 1995. The path is initially alongside the fence and then turns left, where there is a kissing gate on the right, and then continues sharply upwards until, surprisingly quickly, you reach a sandstone quarry (with heavily tool-marked faces) close to the summit.

The units of the Whitby Mudstone are not well exposed on this side of the hill but the uppermost one, the Alum Shale can be seen below the sandstone cliff to the left. The locality of the famous fossil plant leaf bed is out of view at the base of the sandstone cliff. There is no path to it and it is hard to reach Ψ .



9, Summit, 320m (1,050ft) a.s.l. The main beds are of massive, cross-bedded, sometimes coarse-grained, river channel sandstone. There are some thin interbeds of silty sandstone with ripple marks and, also, mud-cracked silty mudstone. Some joints are mineralised with a reddish brown veneer of iron hydroxide (goethite) and there are occasional small nodules of ironstone.

Looking east from the summit ridge

This spot is airy with precipitous drops. The view is fantastic. Notice especially the Cliff Rigg-Langbaugh ridge marking the line of the Cleveland dyke that has been extensively mined and quarried for roadstone materials.

There is a good view of Roseberry Ironstone Mine to the SE ψ.

► Follow the Cleveland Way stone-laid path that descends eastwards passing a small sandstone cliff. The cliff is close to the base of the Saltwick Formation that is about 20m (65ft) in total thickness as exposed on the Topping. Continue the descent to reach the **marker gate** at the northern end of Airyholme Lane. At this point there is the option of walking 365m (400 yards) southwards down the track to have a closer view of the mine site. Continuing the trail, from the gate make your way about 180m (200 yards) across the rough ground and almost back on yourself to the jet shale 'quarries' and spoil heaps.



The ammonite *Harpoceras*

10, Roseberry Common, jet 'quarries' ψ. This area is at the level of the Jet Rock and, although it is usually mined, there are shallow quarries here where about 6m (20ft) of jet shale is exposed. Small pieces of hard jet can be found both here and on the waste tips close by as well as poorly preserved examples of the characteristic ammonite, *Harpoceras*, that is easily recognised by its sickle-shaped ribs.

Looking across towards the Topping, two nicks can be made out on the skyline marked by distinct changes in slope. The lower one marks the level of jet mining, the old drifts and tips. The upper, high level one results from a line of oblong depressions roughly on the 244m (800 ft) contour and marked on old maps as '**British Settlements**' ψ. Their archaeological origin is unclear.

FINAL DESCENT

► Return to the Airyholme Lane gate and then take the path (unmarked on the O.S. map) NW towards the northern slopes of the Topping. About 200 yards (180m) along, the path passes by a shale tip from a drift mine above on the left where there is a further opportunity to search for jet.



The view west from Little Roseberry

The rough path passes over the shoulder formed of the Cleveland Ironstone Formation where there are some indications of quarrying and then across the shelf above Cockle Scar where a group of lower level archaeological pits can be seen close to the path. The stone-laid path then passes steeply down the Staithes Sandstone scar.

11, Small exposures on and by the path These are of thinly bedded silty sandstone from near to the base of the Staithes Sandstone Formation. About 200 yards (180m) beyond this there are further exposures, of mudstone with nodules. This is definitely in the Redcar Mudstone. Note the steeply inclined bedding that is the result of landslipping. This whole area is badly affected. Some slipping must have taken place after the construction of some of the prehistoric remains that have also been affected.

► Continue down the path to reach a stile and from here westwards along the foot of the woods to stop 3 and the Car Park.

BE SAFE AND RESPONSIBLE

LEGAL DISCLAIMER

In making use of any of the information on this Web Site you and your party signify full acceptance that:

You are responsible for your own actions and safety.

You will not hold liable the owners of the Web Site or any other individuals who have supplied information to it for any accident, death, legal action, loss or damage to property howsoever caused that arises from the use of the information on the Web Site.

You are aware that the information contained on the Web Site is not necessarily complete or accurate.

GENERAL SAFETY

Recommended equipment

Walking boots, rain/wind proofs, rucksack, warm clothing, map, compass, watch, whistle, torch, first-aid kit, high-calorie food reserve, water container, mobile phone.

Before setting out

Check the weather forecast and, if appropriate, the tide times and inform others of your proposed trail and likely time of return. Consult the local services such as the coastguard for additional help.

On the trail

Wear appropriate clothes, bearing in mind that the weather may change.

Stout walking boots give the best support and keep your feet dry.

Take some drink and food with you.

Carry at least a small first aid kit for blisters, cuts and bruises and your personal medication.

Keep to the trail or planned route.

Take extra care when the ground is wet or icy and turn back if necessary.

Have a mobile phone for emergencies.

Obtain permission to access private land.

Follow the Countryside Code

GEOLOGICAL CODE OF PRACTICE

Respect and conserve the rocks.

Be considerate. Don't leave exposures in a dangerous state or unsightly, litter the ground (especially fields and paths) with rock fragments or dislodge or drop rocks and stones over cliffs or down slopes.

In places, these trails are close to quarry faces, rocky slopes and airy drops where great care is required. It is best to wear safety helmets at cliffs and steep rock faces (this is enforceable by safety law in quarries and other excavations).

Hammers should be used as little as possible, never indiscriminately, and not at all at places of special geological or archaeological interest. Do not collect *in situ* fossils or minerals unless they are genuinely needed for serious study. When hammering, goggles are essential. Do not disturb walls, buildings, etc. or undermine them in any way.

For more information see the 'Geological Fieldwork Code', published by The Geologists' Association and obtainable from them at Burlington House, Piccadilly, London, WV1 9AG.

THE COUNTRYSIDE CODE

Enjoy the countryside and respect its life and work

Guard against all risk of fire

Fasten all gates

Keep your dogs under close control

Keep to public paths across farmland, woodland, etc.

Use gates and stiles to cross fences, hedges and walls

Leave livestock, crops and machinery alone

Take your litter home

Help to keep all water clean

Protect plants, trees and wildlife

Take special care on country roads

Make no unnecessary noise

Consider other people

Be safe – plan ahead and follow any signs