

The Torquay Geology Tea Trail



Stop 1 – Railway Station

- The station is built from large blocks of pale grey, sedimentary Devonian limestone laid down around 400 million years ago in shallow, tropical seas, when Torbay was south of the equator.
- Solitary rugose corals are scattered throughout. They can be seen in cross-section as circles with a star-shaped pattern in the centre.
- Small colonial tabulate corals (*Favosites* & *Thamnopora*), brachiopods (lamp shells) and calcite crystals can also be seen, as well as a stromatoporoid (the ancient Devonian lime-depositing sponges) towards the car rental office end of the building.



Stop 2 – Corbyn’s Head

Right of Corbyn’s Head (low tide only – check local tide times):

For disabled users look through the railings down to the mud flats below.

- The cliff to the left is formed of Permian breccia around 280 million years old. The breccia is a sedimentary rock containing broken, angular rock fragments, deposited in a desert environment similar to the Middle East today. The stratified, coloured beds were deposited by intermittent flash-floods. This has created a ‘layer-cake’ effect over time.
- The flat rocks below you show spectacular fossil mud cracks – further evidence of drought during the Permian Period. It looks almost identical to dried up riverbeds today.
- The caves in the cliff have been formed by wave erosion. Historically the cliff has eroded rapidly and a sea wall has been built to prevent further erosion and collapse.
- From here you can see headlands of hard Devonian limestone – Daddyhole Plain beyond the harbour to the left and distant Berry Head to the right. Between them the softer Permian breccias, visible at Corbyns Head and Livermead Head to the right, have been eroded by the sea to form Torbay.

Remember – check the weather forecast and tide times before you venture out on your walk. Stay safe!



Cliff of bedded breccia - Photo: Chris Proctor



Fossil mudcracks - Photo: Chris Proctor



Stop 3 – Corbyn’s Head

Left of Corbyn’s Head

- The cliff and sea stack consist of Permian breccia. The sea stack has been separated from the cliff by marine erosion. To the right of the sea stack is a fault – a line of fracture along which earth movements have occurred. This is a normal fault: the rocks on the right hand side of the fault have dropped down by about 1 metre (3 feet) relative to the rocks on the left side.



Normal fault in breccia - Photo: Leah Whitcher

- The breccia of the stack contains fragments of stone within a finer matrix. This sediment was washed down by flash floods which carried sediment down from highland areas to be deposited as breccia fans at the valley mouths.
- Explore the beach, which is scattered with pebbles eroded from the breccia, including the purple-red pebbles of quartz porphyry – an unusual type of volcanic rock with large crystals of quartz and feldspar embedded in a fine matrix.



Stop 4 – Mid Section of Sea Wall

- The sea wall is built from blocks of grey Devonian limestone and red Permian breccia.
- The limestone contains many fossil stromatoporoids – the lime-secreting sponges that were the foundation of Torbay’s Devonian reefs – as well as a variety of beautiful fossil corals.
- The breccia in this wall is different from that at Corbyn’s Head . It contains much more limestone showing that it is from a different valley source. The angular shapes of the stones shows that they have not been carried very far, as long transportation wears any sharp points away to more rounded shapes. Many corals, stromatoporoids and other fossils can be seen in the limestone pebbles embedded in the breccia.



Limestone pebble with fossils in breccia
Photo: Leah Whitcher

Stop 5 – Submerged Forest (exposed at low tide after storms only)

- Rarely, after winter storms, the sand is washed away by the sea to expose the forest bed beneath. The forest bed consists of a stiff, dark grey clay containing logs, roots and branches. It is the remains of a marshy woodland which grew in the bay around 5,000-10,000 years ago when the sea level was lower. The forest bed continues under the road, and was exposed during Victorian excavations in King’s Gardens near King’s Avenue.
- A Mesolithic tranche axe from the Torre Abbey Sands forest bed can be seen in Torquay Museum, along with wild boar, aurochs and wolf bones found in Kings Gardens.
- There are similar submerged forest beds at Goodrington and Broadsands.

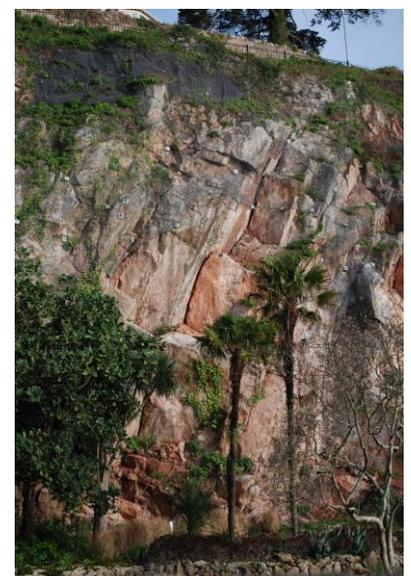


Fossil log in forest bed - Photo: Chris Proctor

Stop 6 – Rock Walk (Royal Terrace Gardens): The Sticklepath Fault



- The vertical limestone cliff is the plane of the Sticklepath Fault, a major fault dating from the mountain-building earth movements of the Variscan Orogeny around 300 million years ago. From here the line of the fault can be traced right across Devon.
- This is an example of a strike-slip fault, on which movement of the rocks to either side was horizontal rather than vertical. The total movement along the fault has been about 5 kilometres (3 miles).
- On one side of the fault, Devonian limestone is exposed in the cliff face. On the other side was softer Permian breccia which has been eroded away to expose the fault plane. A low reef of Permian breccia can still be seen nearby at low tide just off Torre Abbey Sands. It is known locally as Harbreck Rock.



Sticklepath fault plane - Photo: Leah Whitcher

- Large movements have occurred on the fault several times since it formed, until the Oligocene period around 30 million years ago. Minor movement continues today - an earth tremor was recorded in 1955.

To find out more about Torbay's amazing Geopark story follow the harbour and take the left hand turn at the clock tower up Torwood Road to Torquay Museum, opposite Torwood Gardens. There you will find galleries dedicated to other exciting specimens, including fossils, prehistoric artefacts and interactive displays.

For more information about the social history of Torbay, and information about how and why different stones were used in its buildings, visit beautiful Torre Abbey & Gardens. <http://www.torre-abbey.org.uk>

Brixham Heritage Museum has some wonderful collections and information about Brixham Bone Caverns – the site of the first excavation in the Bay by William Pengelly, eminent geologist and palaeontologist. <http://www.brixhammuseum.org.uk>



Jawbone of early modern human from Kent's Cavern, 41,000 – 44,000 years old
Photo: Chris Proctor



Early Holocene deer antler from King's Gardens near Torre Abbey, 5,000 – 10,000 years old - **Photo: Chris Proctor**

Café stops on the trail:

Station Café - Great hot chocolate, teas, coffees and snacks.

Corbyn's Head Beach Café - Beach hut style café on the footpath. Outside seating only. Open in winter too on dry, sunny days.

Torre Abbey Tea Rooms – Friendly staff; fantastic coffee, cakes and lunches

One World Café - Great cakes and other lovely stuff.

Pier Point Café - Amazing views across to Brixham - seating outside and in.

Pengelly's Café - Torquay Museum's lovely 'Taste of the West' café. Delicious food, locally sourced. (Currently closed until further notice).

Trail compiled by Chris Proctor & Leah Whitcher

For Torquay Musuem & café head up Torwood Road



6

Torbay Road

Torbay Road

Harbreck Rock

5

From Corbyn's Head you can look out and see the limestone Peninsula of Berry Head, Brixham. Brixham is where you can find the Heritage Museum.

4

Torre Abbey House & Gardens

1

3

2

Torbay Road

Aerial photography courtesy of Channel Coast Observatory (www.channelcoast.org)