Calton Hill and Edinburgh East End — Geological walk — Monuments in stone

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Calton Hill and East Edinburgh

Calton Hill lies to the east of Princes Street. It is easily reached by bus or on foot, see map below.

A walk is described overleaf. The first ten localities describe the outcrops and buildings on Calton Hill itself, and give access to the panoramic views. Localities 11 to 36 describe many of the important buildings around the north, west and south of the hill, together with the geology of their building stones. The recommended route along paths and pavements is shown in blue on the diagram overleaf. Edinburgh traffic can be very busy so take care crossings. The tour starts at the east end of Waterloo Place, where the south-west entrance to the park leads up steps on to Calton Hill (Route Map locality 1).

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(Front cover) Front cover.

Calton Hill a Edinburgh's East End

Edinburgh's dramatic landscape owes much to the varied nature of the underlying geology, even though the rocks were formed some 300 to 350 million years ago, in the era known as the Carboniferous. The hard volcanic rocks stand up as hills, while the softer sedimentary rocks have been worn down to form the low ground. Erosion, especially by ice, has given the hills their sharp and ridged appearance. Calton Hill is typical and displays many of the features of Edinburgh's volcanic hills. In addition it is surmounted and surrounded by buildings of the Edinburgh New Town, now a World

Heritage Site. Finally the short climb to the top is rewarded by one of the most spectacular panoramas in the Lothians.

Calton Hill is protected by Scottish Natural Heritage as a Site of Special Scientific Interest as part of the Arthur's Seat Volcano SSSI complex which also includes Edinburgh Castle Rock.

To the south, lies the Arthur's Seat Volcano (see drawing in PDF). The top part of the tilted volcano has been lost, and only fragments are left. The double summit is the remnant of the two central vents where the molten rock, or magma, came to the surface. The ridges on Whinny hill, to the left, are the remaining part of the cone built up by lava flows from many eruptions, with layers of volcanic ash, or tuff, thrown out during explosive episodes. Each rocky ridge is formed of one lava flow, each grassy hollow hides tuff. [Salisbury Crags is a quite different geological formation called a sill, formed where the molten rock did not reach the surface, but was squeezed between sedimentary layers.]

Calton Hill is a fragment of the cone of the Arthur's Seat Volcano, displaced by a geological fracture, the Calton Fault, to the south, and bounded to the west, by the Calton Fault. On Arthur's Seat there are 12 lava flows, with bands of volcanic ash; there are fewer lava flows, but more ash, on Calton Hill. To the west, the lower lavas are formed of basalt, a black rock with crystals; on the eastern summit, the upper lavas are formed of mugearite, a paler crystalline rock. Geological forces tilted the rocks so that they slope, or dip, to the east, just as can be seen on Arthur's Seat. Thus the lowest, oldest rocks occur on the west side of Calton Hill, and the younger rocks form the east slopes.

The Carboniferous sedimentary rocks, including the sandstones, which were quarried for the building of the New Town, occur in the low ground. During their formation in Carboniferous time, eastern Scotland was occupied by river deltas depositing great thicknesses of sands and muds. The quarries are mostly infilled. Fortunately at the former Craigleith Quarry in Blackhall, now a RIGS (Regionally Important Geological Site) the upper parts of the Craigleith Sandstone are preserved and accessible. This sandstone is very fine-grained and grey-white.

The final major geological act was the ice age which lasted from over 2 million years ago to as recently as 15 thousand years ago. On several occasions, a thick ice-sheet covered the Edinburgh area, and moved from west to east, moulding a west–east Grain and forming the geological feature called crag-and-tail. Calton Hill is a crag-and-tail, as is Edinburgh Castle. Each has steep cliffs round the west side worn by the ice, and a long, gently sloping tails to the east in the lee of the ice-flow.

A walk is described overleaf. The first ten localities describe the outcrops and buildings on Calton Hill itself, and give access to the panoramic views. Localities 11 to 36 describe many of the important buildings around the north, west and south sides of the hill. The later classical buildings on Calton Hill associated with the extension of the New Town and constructed in the late 18th and early 19th century were designed by some of Scotland's most famous architects. They have a story to tell about the use of stone.

A walk amongst monuments of stone

1 Start at Calton Hill Steps [NT 26102 74090] where you can see the rocks which form Calton Hill: coarse-grained bedded tuff is overlain by basalt lava.

2 Climb steps to Dugald Stewart Monument [NT 26138 74131] (built 1831, designed by William Playfair) of yellowish-grey sandstone from Humbie, West Lothian.

3 Townscape panorama towards Edinburgh Castle. [NT 26177 74141]

4 Old City Observatory House (1776, James Craig), [NT 26200 74183] earliest building on Calton Hill, of local volcanic materials in rubble work which can be matched with the lava exposed on W side of Observatory; note the oblong white crystals and rounded gas bubbles. The rubble walls contrast with dressed sandstone masonry of the observatory extension and adjacent New Observatory (William Playfair, 1818).

5 Playfair's Monument [NT 26229 74164] (1826, William Playfair) to his uncle Prof Joanni Playfair, built of sandstone from Craigleith Quarry, west Edinburgh.

6 The Nelson Monument, [NT 26255 74114] in the shape of an inverted telescope, (c.1816, Robert Burn) of Craigleith Sandstone.

7 Panorama of the Arthur's Seat Volcano. [NT 26255 74114] Cliff below formed by two lava flows.

8 Unfinished National Monument [NT 26299 74157] (1826, C R Cockerell and William Playfair) 12 columns each of 13 pieces surmounted by impressive architrave of Craigleith Sandstone with wispy bedding of mica flakes.

9 NE part of New Observatory [NT 26230 74207] (1895, Robert 4 Morham) octagonal building with copper dome, sandstone from Binny Quarry, West Lothian. Panorama across Firth of Forth.

10 [NT 26265 74312] Note two glacial features here: glacial erratics, large boulders carried and dumped by the ice sheet, ring the turning area; and the Triangulation point on glacially smoothed pavement of mugearite lava showing typical closely spaced joints.

11 Take path downhill to Royal Terrace [NT 26327 74400], passing the 'stiff gothic' Greenside Church (1830, James Gillespie Graham). Royal Terrace Gardens were extensively quarried for stone prior to 1820s. Continue along the upper part of Leith Walk and along Queen Street.

12 St Mary's Roman Catholic Cathedral [NT 25941 74330] (1813, James Gillespie Graham) repaired with fine greenish grey sandstone from Woodkirk, Morley, Yorkshire.

13 St Paul's and St George's Episcopal Church [NT 25900 74387] (1816, Archibald Elliot) of fine-grained sandstone from Redhall, Edinburgh.

14 Paton Building [NT 25632 74273] refaced with warm coloured Triassic sandstone from Clashach near Elgin as in Museum of Scotland, Chambers Street.

15 National Portrait Gallery [NT 25604 74266] (1890, R. Rowland Anderson), reputedly first use in city of gaudy New Red Sandstone (Permo-Triassic); red sandstone from Moat, near Longtown, Cumbria, with recent repairs from Corsehill, Annan; granite pillars on first floor windows at side and front.

16 The former Scottish Equitable Assurance Building (1899, J M Dick Peddle and George Washington Browne; 11 reconstructed 1982, Michael Laird) of pink Doddington sandstone, Wooler; slump bedding structures low down on SE corner.

17 North side of St Andrew Square [NT 25572 74186] note contrasting styles of rubble work. Nos 21, 22 (1770–72) of coursed rubble, probably local stone from Bearford's Parks; ashlar facing of ground floor dates from 1845–48; No 21 has Doric porch (1840), probably of Binny stone; No 22 Corinthian porch (1854) stonework around lower windows also looks like Binny stone (c1840).

18 Monument to Henry Dundas, Viscount Column [NT 25597 74110] (1821) of Cullalo sandstone, Fife; Statue (1828) by Robert Forest.

19 In Thistle Street [NT 25494 74174] the Standard Life Extension Phase One (1964, Michael Laird & Partners) is constructed of sandstone from Blaxter, Otterburn, Northumberland. In Thistle Street South East Lane the rear of building is constructed of sandstone with a pronounced wispy lamination.

20 Thistle Court (c.1768) [NT 25474 74167] is of locally derived rubble including volcanic rocks. Reputedly the first house built in the New Town.

21 The Scottish Life building (1962, Gordon a Dey), 19 St Andrew Square, [NT 25500 74152] has superb entrance columns of polished larvikite, a blue syenite from Norway. The sandstone cladding is from Springwell, Gateshead and Wellfield, West Yorkshire.

22 The Standard Life building of rusticated sandstone ashlar [NT 25510 74107] (1897–1901, J. M. Dick Peddie a George Washington Browne) occupies the corner of St Andrew Square and George Street. Next to this building in George Street is the Phase Three Extension (1975, Michael Laird a Partners) with sloping cladding below the ground floor windows of a granitic gneiss of large pale feldspar in matrix of quartz, black biotite and ruby-red garnet. The adjacent building, No.13 George Street, with grey granite columns, was designed for the Royal Insurance Company (1898, W. Hamilton Beattie).

23 Columns and portico of St Andrew's and St George's Church [NT 25425 74102] (1785, Major Andrew Fraser) of Craigleith Sandstone, wispy with oxidised inclusions. Main building is polished ashlar front and droved circular body, reputedly of Redhall stone but looks like Craigleith.

24 The Corinthian Portico of the Dome [NT 25447 74082] (formerly Royal Bank of Scotland, 1847, David Rhind) is of Binny Sandstone.

25 Former Guardian Royal Exchange building [NT 25503 74067] (1940, Leslie Grahame Thomson) of grey Creetown Granite over polished black gabbro.

26 Former Scottish Widows building (1962, Basil Spence, Glover Et Ferguson), [NT 25537 74029] 9–10 St Andrew Square, has Carboniferous Derby Dene limestone (with crinoids & brachiopod fossils) over black Bon Accord gabbro.

27 Charles Jenner's Workshop (1902) [NT 25479 74001] of bright red sandstone from Gatelawbridge, Thornhill, Dumfriesshire. Jenner's Store, which fronts on to Princes Street, of very pale orange sandstone from Cragg, Bellingham, Northumberland.

28 The Scott Monument [NT 25585 73904] (1846, George Meikle Kemp) of Binny sandstone. Recent indents of Clashach and Binny stone.

29 The Royal Bank of Scotland Dundas Mansion [NT 25682 74114] (1772–74, Sir William Chambers for Sir Laurence Dundas) of sandstone from Redhall; NB cross-laminations on right side. Morgan House (north pavilion to Dundas mansion) (1769, Robert Adam) is of Craigleith.

30 Register House [NT 25782 74097] (Robert Adam's masterpiece, started 1774) mainly of Craigleith; northern extension (1834) possibly Binny Sandstone; later extensions (1882) of Longannet. In front, the Iron Duke (Duke of Wellington) by Sir John Steel!, in bronze on Peterhead granite.

31 Balmoral Hotel [NT 25814 73981] (1902, W. Hamilton Beattie) of Prudham Sandstone from Fourstones, Hexham, Northumberland.

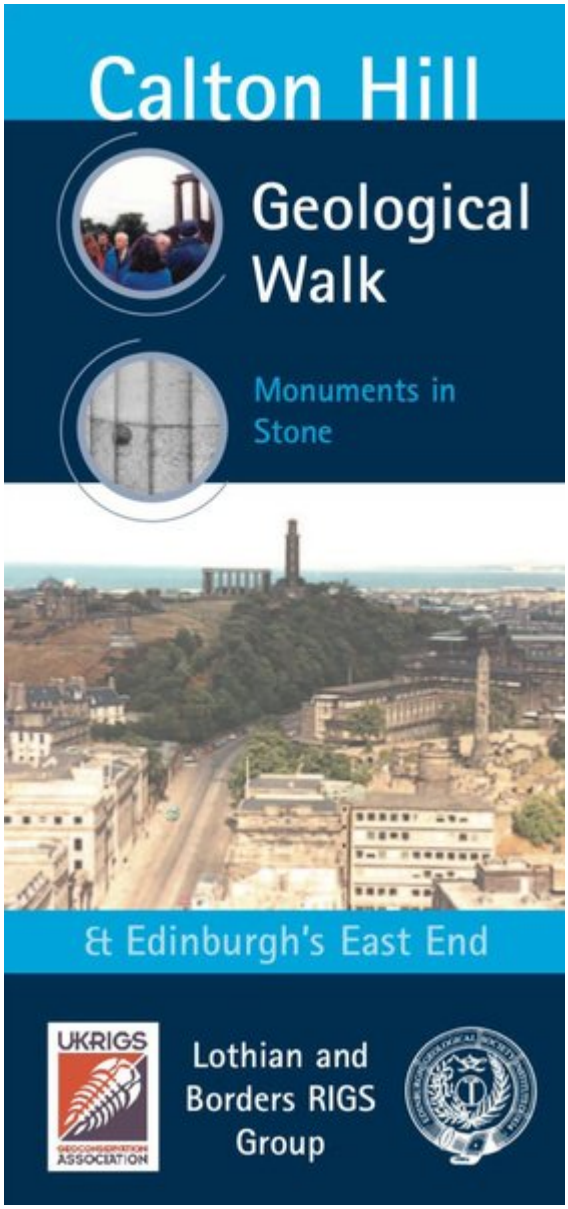
32 The former General Post Office [NT 25881 73996] (1866, Robert Matheson) of Binny Sandstone. The rear (seen from Regent Bridge) of Doddington Sandstone from Wooler, Northumberland.

33 Regent Bridge [NT 25964 74046] (1815, Archibald Elliot), top of Craigleith Sandstone; below of sandstone from the Craigmillar quarries, south Edinburgh.

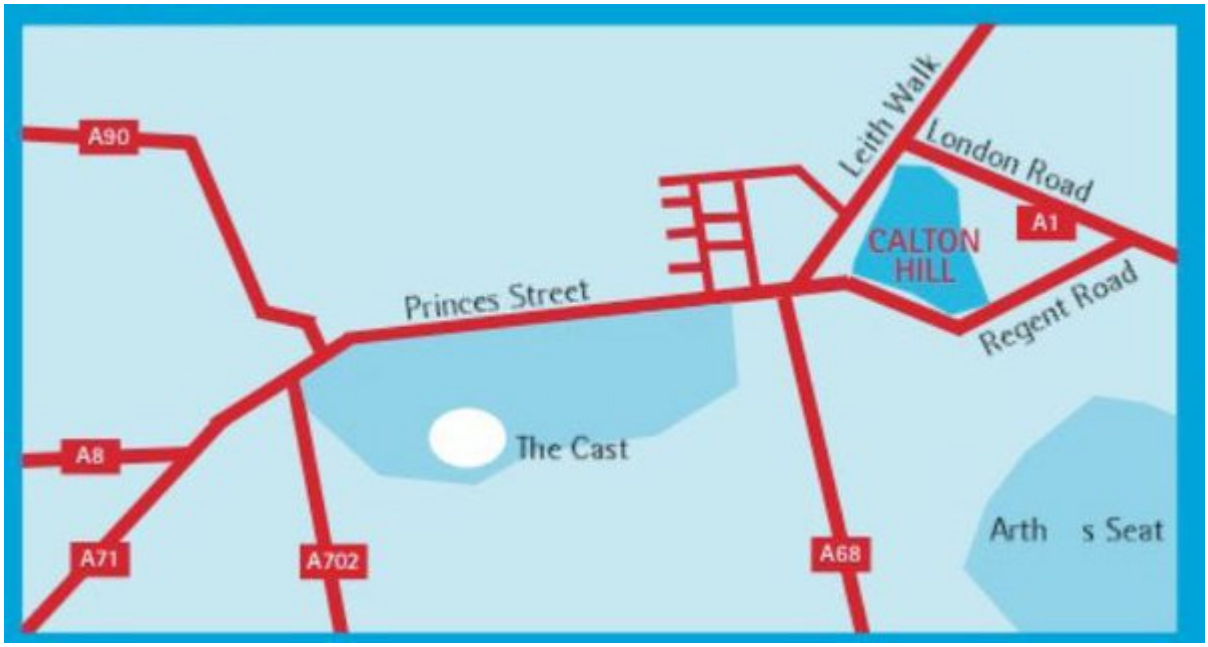
34 Old Calton Burying Ground, [NT 26040 74042] monuments display varying weathering. Governor's House of Calton Gaol (1817, Archibald Elliot), of sandstone from Hermand, West Lothian.

35 St Andrew's House [NT 26113 74059] (1934–39, Thomas Tait) of sandstone from Darney, Northumberland.

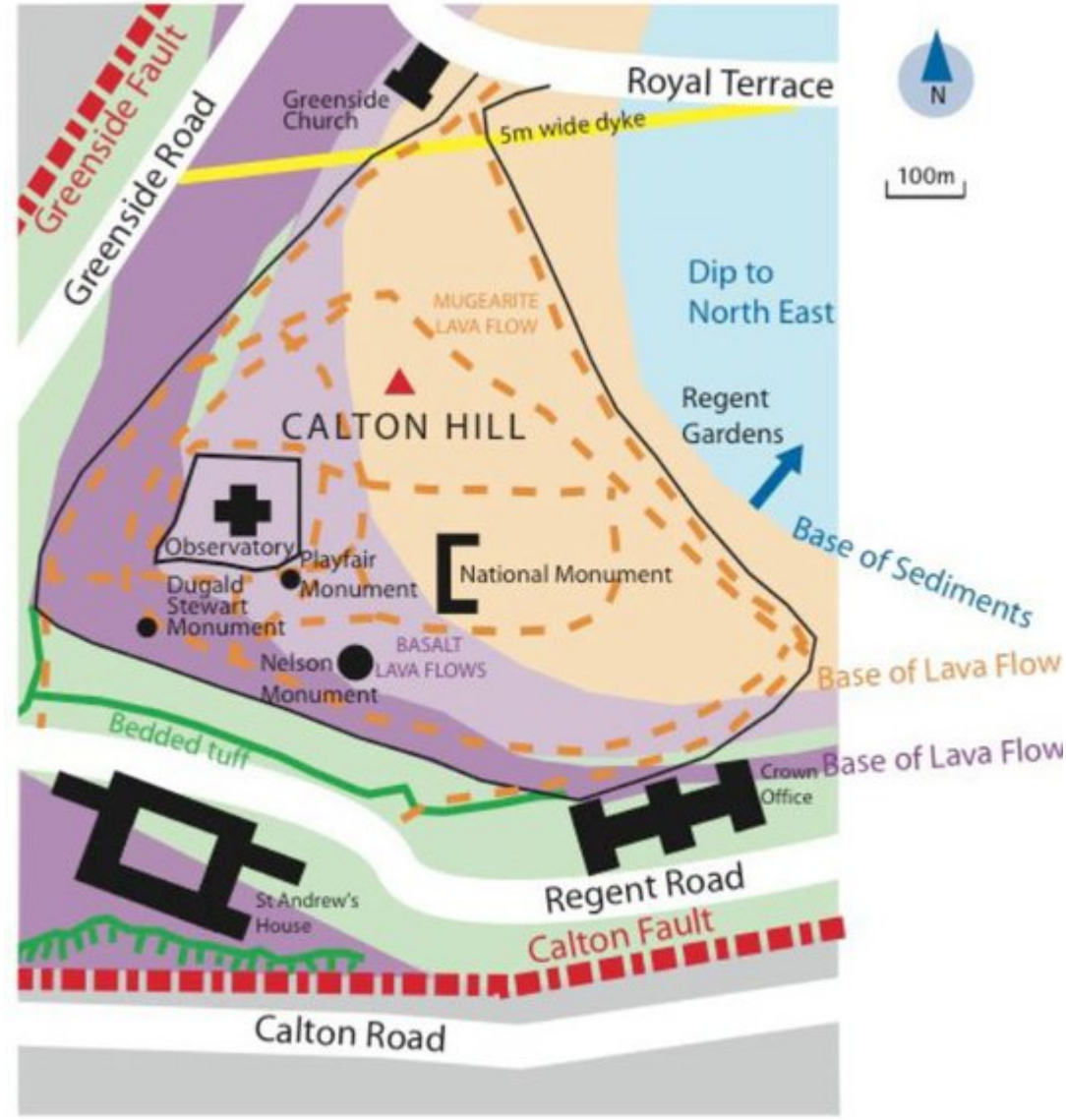
36 The former Royal High School [NT 26363 74014] (1829, Thomas Hamilton) of Craigleith Sandstone. This building used for the Scottish Assembly, considered for the Scottish Parliament, now destined as museum of early photography.



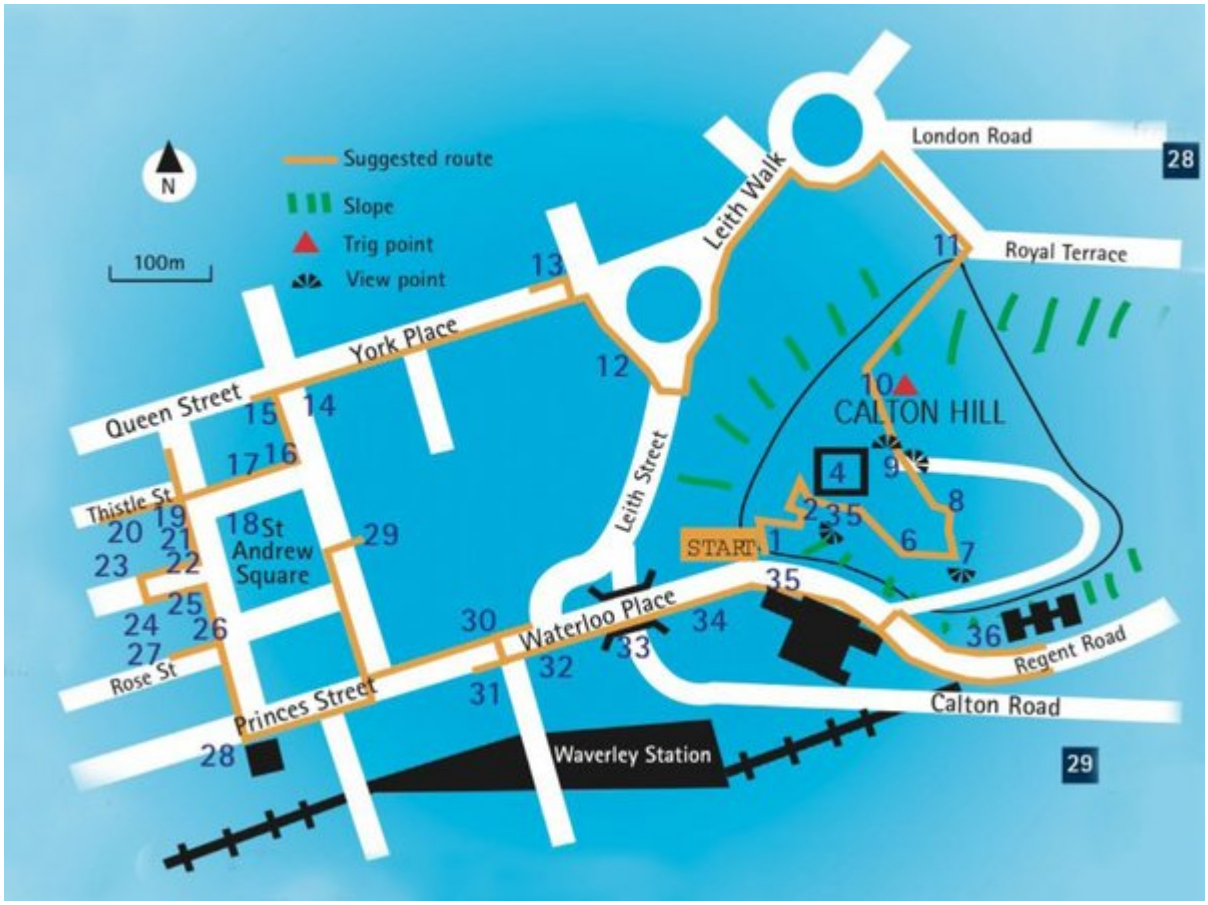
Front cover.



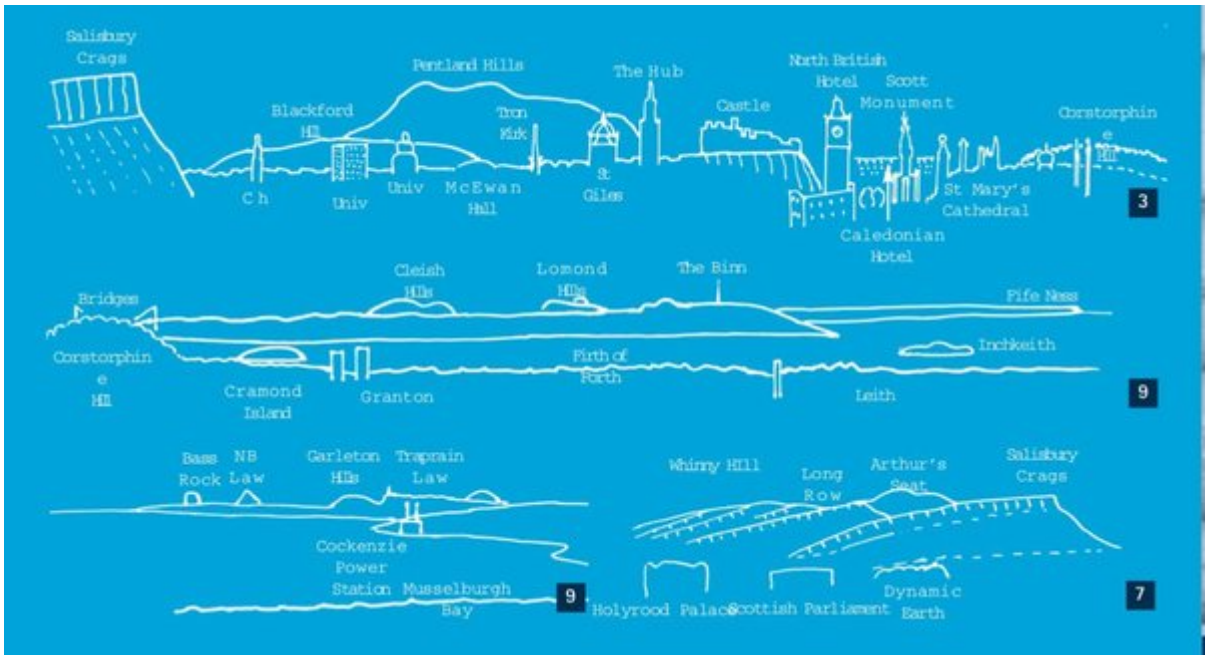
Location map.



Location map, Calton Hill.



Stops on the excursion.



Panoroamas. 3. Townscape panorama towards Edinburgh Castle. [NT 26177 74141]; 7. Panorama of the Arthur's Seat Volcano. [NT 26255 74114] Cliff below formed by two lava flows; 9. Panorama across Firth of Forth. [NT 26230 74207]