
Blackford Hill and Dreghorn

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O.S. 1:50000 Sheet 66 Edinburgh

B.G.S. 1:50000 Sheet 32E Edinburgh

B.G.S. 1:25000 Edinburgh Special Sheet

Route: (Map 6)

Introduction

Blackford Hill is the northern continuation of the Lower Devonian Pentland Hills Volcanic Rocks (Mykura 1960, 1962). The hill is formed of basic andesite and trachyte lava flows. Low ground round the north and west of the hill is underlain by red sandstones of the Upper Old Red Sandstone. Blackford Hill was moulded into its present crag-and-tail shape by an easterly-flowing ice-sheet. The ice laid bare the rocky crags round the west side of the hill, and, deflected to either side of the hill, gouged deep hollows now occupied on the north side by Blackford Pond and on the south side by the alluvium of the Braid Burn. The gently sloping tail on the eastern (leeward) side of the hill is followed by Observatory Road.

The excursion is concerned with both volcanic rocks and glacial features and also looks at several buildings of geological and other interest. Two hours should be sufficient time for the excursion. but extra time should be added for visits to the public buildings and for Dreghorn (Locality 14). Lothian Region Transport bus routes pass along the roads north and east of Blackford Hill. Parking is available on these roads and also opposite the Observatory.

1. Grant Institute of Geology

For over 200 years Edinburgh University has been renowned as a centre for geological research. This tradition continues in the Grant Institute of Geology, named after its benefactor, Sir Alexander Grant. The masonry of the main building, dated 1931, is grey Carboniferous sandstone from Blaxter Quarry, Northumberland. The more modern extension on the east side houses high temperature and pressure experimental petrology laboratories.

2. Murchison House: British Geological Survey

This modern yellow brick building houses the Scottish office of the Survey, founded in 1835. Its name derives from Sir Roderick Murchison. Director of the Survey when mapping started in Scotland in 1854. Survey research includes land and offshore geology, geophysics, seismology and geomagnetism. Murchison House has the largest public geological reference library in Scotland with over 30000 books, 150,000 serial volumes and 15,000 maps. The bookshop stocks geological maps, books and other products for sale to the public. Murchison House is open during week-days only.

3. Harrison Arch (Figure 11)

Commanding the entrance to Observatory Road, this fine arch of Permian red sandstone from Dumfries, has inscriptions commemorating George Harrison and the sale of Blackford Hill to the City of Edinburgh in 1884.

4. Reid Memorial Church

The Gothic-style church was designed by Leslie Graham Thomson in 1933. Pink Upper Old Red sandstone from Hawkhill Wood Quarry, Craigmillar, was used to build the church and Doddington Stone, a Carboniferous sandstone from

Wooler, was imported for the facing stone.

5. Blackford Pond: ice gouge, erratics

The pond lies in a hollow gouged out by ice deflected round the north side of Blackford Hill. The work of ice can also be seen in two dolerite erratics (Figure 12), transported from one of the sills to the west, and now embedded in granite sells near the Midmar Drive entrance.

6. Quarry: andesite lavas

Above the path up from the pond is an overgrown quarry cut out of the western face of Blackford Hill. The lowest rock seen is a pale trachytic lava overlain by a thin agglomerate containing trachyte blocks. Above this the main quarry face was cut into the single flow of dark fine-grained basic andesite which forms most of Blackford Hill.

7. Boundary wall: sandstone, andesite

Note how the availability of stone is reflected in the wall along the path. Opposite the quarry dressed pink and white sandstones make up the entire wall. Further south angular purple andesite blocks and the occasional rounded erratic were used in constructing the wall but softer dressed sandstone blocks were preferred for embedding the posts.

8. Braid Burn: ice gouge, glacial channel

On coming round the hill the valley now occupied by the Braid Burn opens out to view. The burn is a misfit in such a large valley. Originally the valley was carved out by ice deflected round the south side of Blackford Hill, but was then further deepened as the ice melted and spilled torrents of water from the Water of Leith at Colinton through the Hermitage of Braid. The steep northerly side of the valley is cut in andesite lava while on the gentler southern slopes the andesite lava is mantled by boulder clay.

9. Blackford Hill quarries: andesite lava

Extensive quarrying for road-metal on the southern slopes of Blackford Hill has produced several faces exposing andesite lava, much of it badly altered. Weathering to red or purple, the fresh andesite is dark grey and finely-crystalline with sparse phenocrysts of plagioclase, augite and biotite, set in a matrix showing flow texture. Veins of red jasper and green chlorite cut the rock. The newer quarry to the east is being infilled with refuse.

10. Agassiz Rock: ?glacial striae

Set near the bottom of the valley, this rock has been protected as a site of Special Scientific Interest, as one of the localities where in 1840 the Swiss geologist Louis Agassiz identified the erosive action of ice in Scotland. Designation, however, has not protected the rock from natural erosion. Frost-shattering has caused part of the rock to fall and all but destroyed the horizontal scratches Agassiz identified as striae along its base. Although other interpretations, such as erosion by glacial meltwater and slickensiding, have been put on these scratches, this site still remains a landmark in the understanding of Scottish glacial geology.

12. Corbie Craig: crag-and-tail

Return east by the Braid Burn and up the path from the bridge. South-east of the summit Corbie Craig forms a superb example of the glacial crag-and-tail feature. It demonstrates in miniature the form of Blackford Hill itself.

13. Blackford Hill: views from the summit

A climb to the summit of Blackford Hill is rewarded on a clear day with panoramic views of central Scotland. All the nearby hills are formed of Carboniferous or Devonian igneous rocks, the intervening low ground being generally drift-covered sedimentary rocks. Dominating the view to the north-east are the remains of the Arthur's Seat volcano, with the cliffs of the Salisbury Crags teschenite sill and the columnar basalt of Samson's Ribs. Edinburgh Castle to the north sits on a dolerite plug and forms a fine crag-and-tail feature with the Royal Mile. The hills of Fife across the Firth of Forth, and of East Lothian, are mainly Lower Carboniferous lavas and intrusions, and the hills to the west are mainly teschenite or quartz-dolerite sills.

Older, Devonian, volcanic rocks form the Pentland Hills running south-west from Blackford Hill and also the Ochil Hills across the River Forth to the north-west. In the west, flat-topped bings of spent shale from the once-thriving West Lothian oil-shale industry contrast with a more distant conical coal bing in the Central coalfield. To the south-east rounded Southern Upland hills are made of Lower Palaeozoic greywackes and shales. Together with southern Highlands hills of metamorphic Dalradian rocks, seen far to the north-west, they enable the full width of the Midland Valley to be appreciated.

11. The Royal Observatory, Edinburgh: Visitor Centre

Dominating the east slopes of Blackford Hill is the Royal Observatory, its stone building constructed of grey sandstone from Doddington and Hailes quarries. Originally moved here from Calton Hill in 1896 to escape the city lights, the observatory now has telescopes as far afield as Australia and Hawaii. The wide range of astronomical research can be viewed in the Visitor Centre, which is open on weekdays and on afternoons at weekends.

14. Dreghorn Spur: Upper Old Red Sandstone sediments

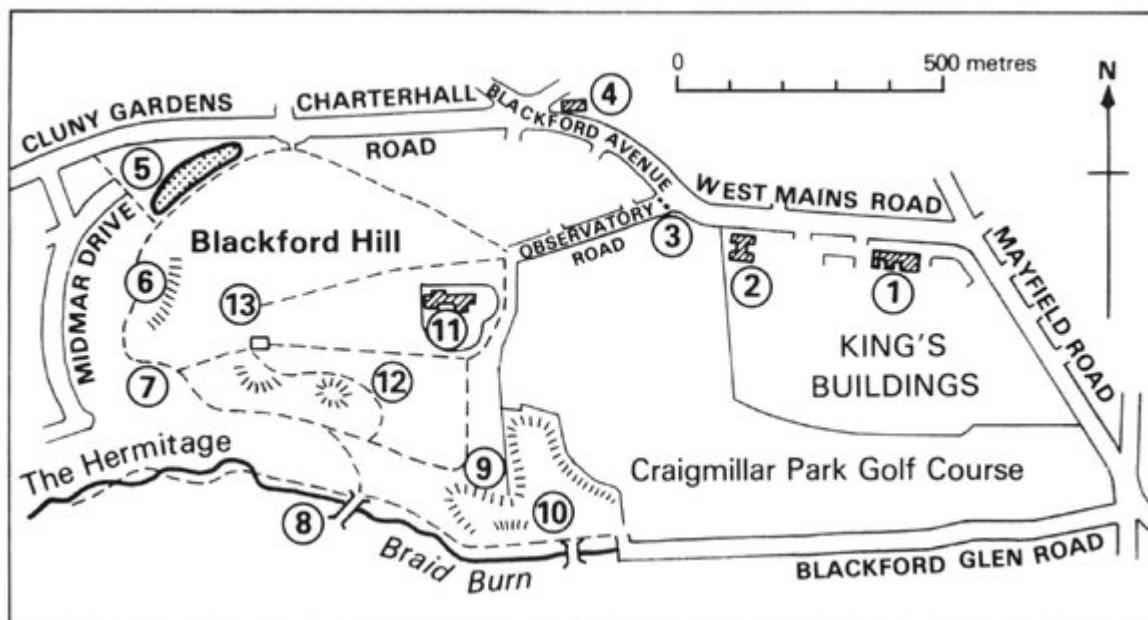
A fine, easily accessible section in the Upper Old Red Sandstone sediments which overlie the Lower volcanic rocks of Blackford Hill, has been cut for the Dreghorn Spur [NT 231 684] of the Edinburgh City Bypass. From Blackford Hill drive west along Cluny Gardens to Morningside, south along the A702 for 3 km to the Bypass, west along the Bypass for 1.5 km, and take the Dreghorn Spur north to Redford Road where parking is permitted. Access to the west side of the cutting is along the footpath. Do not cross over this busy road.

The cutting is capped by 1 to 2 m of grassed till on an undulating rockhead, which has been gouged deeply at the west end of the footbridge. The section on the west side of the cutting exposes almost 50 m of Upper Old Red Sandstone sediments, dipping at 150 to 250 to the south-west and cut by several small faults. Sandstone is the dominant lithology, in beds up to 5 m thick, ranging in colour through pale purple, dark purple, pink and white. Some beds of sandstone are fine-grained, other beds are medium to coarse-grained with pebbly bands containing mudstone flakes as well as quartz and cornstone pebbles. The sandstones vary from poorly bedded to well-bedded, in places cross-bedded. Thin beds of grey-green, red-purple or brick red mudstones and siltstones lie between the sandstones. Cornstone nodules can be found in one of the finer bands near the south end of the section. Cornstones are concretionary limestones similar to calcretes, indicative of the semi-arid climate of Upper Old Red Sandstone times. A NW-dipping fault with a small throw is well exposed 150 m south of the footbridge.

The two sides of the cutting provide interesting insight into the contrasting engineering problems produced by dipping bedded rocks. On the east side where the beds dip towards the road it has been necessary to strip off whole layers along bedding planes; in addition holes have been drilled to drain water from the sandstones. A much steeper face has been left on the west side where the beds dip into the bank. Here the sandstone blocks are more stable but softer mudstone and siltstone beds have been walled over to prevent erosion.

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References



(Map 6) Blackford Hill.



(Figure 12) Dolerite erratics.