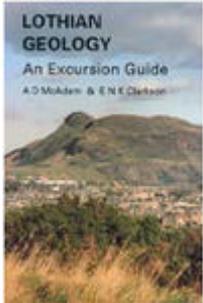


# Dunbar - an excursion

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By E.H. Francis. From: [Lothian geology: an excursion guide](#). Edited by A.D. McAdam and E.N.K. Clarkson. 1996.

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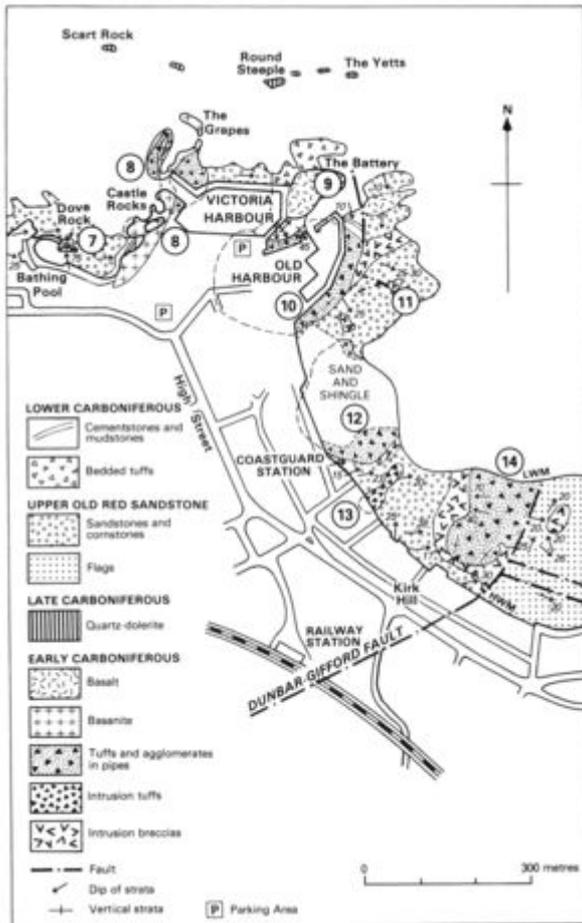
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## Dunbar

From the car parking areas at the Barracks (NT 677 791) or Victoria Harbour (NT 679 793), the walking distance is about 4 km (3 km if the Dove Rock is excluded), with 2 km to walk back through the town to the starting point.

### 7. Dove Rock

Dove Rock is a small plug of basanite surrounded by a narrow inner zone of tuff and an outer zone of partly brecciated inwardly dipping sandstone bounded by a ring fracture. Further incipient ring fractures are seen beyond it. As similar rocks and structures can be seen elsewhere, and as the bathing pool makes access difficult, it is suggested that if time is short both this locality and the seaward side of Castle Rocks could be omitted.



Dunbar - excursion map.

## 8. Castle Rocks

The neck at Castle Rocks straddles the entrance to the New (Victoria) Harbour (Figure 15), but the margin is accessible at only one locality, just south of the entrance. Even here it is partially obscured by the wall of the old castle, where shattered indurated sandstones dip westward towards the neck. The tuff, which can be examined north of the harbour is red and green and contains evenly distributed lapilli of basalt and older tuffs up to 2 or 3 cm in diameter. It is coarsest to the south-east where there are blocks of fine-grained basalt, up to 30 cm across. The tuffs are indurated by basanite dykes and traversed by red veins containing a central portion of calcite and chalcedony and an outer lining of hematite.

## 9. The Battery

The Battery is built on a columnar, reddened, decomposed porphyritic basalt (Figure 16) which appears to be conformably underlain by bedded tuffs. It resembles early Carboniferous lavas cropping out 1.5 km to the east (Clough et al. 1910, pp. 91, 105-6) rather than the basanites of the minor intrusions associated with the necks. Neither the basalt nor the underlying tuff appears to lie within the Old Harbour Neck (see below) and their stratigraphical position is obscure within a faulted sequence of both Old Red Sandstone and Carboniferous sediments.

## 10. Old Harbour Neck

The neck underlying the Old Harbour is most clearly delineated on its eastern side where the flanking sandstones form a wall rising above the volcanic rocks. This wall, which inclines in towards the neck at between 50° and 60°, is vertically fluted and polished and represents a plane of movement cutting off the bedding. Veins of intrusion tuff can be seen in the sandstone. Followed

seawards, the margin swings west beneath the Old Harbour wall and reappears between the two harbours where it has a south-westerly trend. Beneath the drawbridge on the east wall of Victoria Harbour the outer flanking sediments comprise red marls and cementstones with interbedded yellow and green tuffs. They are crumpled and tilted steeply towards the neck, swinging round from there to dip conformably northward beneath a basalt underlying the Battery. South of the inter-harbour area the neck margin is built over but a few exposures of tuff can still be seen west and south of the Old and Victoria harbours respectively.

The neck filling consists of red or, locally, green lapilli-tuffs which are bedded in the north and west, where they strike parallel to the walls and dip inwards at angles ranging from 45° to vertical, East of the Old Harbour wall. However, they have a heterogeneous aspect. This derives partly from the presence, close to the margin, of basaltic blocks and masses of country rock up to 2.5 m in diameter, and partly from the breakdown of original bedding. The bedded relics, some of them intensely crumpled do not form discrete blocks, but merge instead into an apparently structureless rock. The peripheral tuffs are laced by anastomosing veinlets of hematite and there are, in addition, sills and dykes of similar material up to 60 cm thick. A linear breccia lies to the east of the neck. It has a north-easterly alignment decreasing in width as it is traced from the margin towards low water mark. Like the linear breccia at Belhaven it is derived from the local sediments (sandstones in this instance); it occupies a faulted trough and in places contains marginally orientated blocks. By way of contrast, however, it appears to be related to the adjacent neck, for there is no well defined margin between the two, and the western part of the breccia is penetrated by red tuffs which are similar to the unbedded variety in the neck. The sandstones in the breccia and along the neck margin show typical carious weathering as described from the eastern margin of the Parade Neck.

### **11. Cryptovolcanic Ring Structures**

Two ring structures are exposed to the east of the Old Harbour Neck. The northern is emplaced along a fracture radial to the neck and consists of blocks of local sandstone penetrated by veins of red tuff. Here and in the southern structure the margins are outlined in part by vertically aligned blocks of sandstone.

### **12. Coastguard Station Neck**

This neck, like that of the Old Harbour, is rimmed by massive sandstone. Where the margin is continuously exposed on the south it has a regular curving outline and is inclined inwards at 70-80°. Long slices of sandstone, apparently detached from the walls, are now separated from the parent mass of country rock by a narrow zone of unbedded red tuff. The neck filling also resembles that at the Old Harbour in its patchy red and green colour, random scatter of bombs, marginal plexus of red hematitic veins and nearly vertical bedding which strikes parallel to the walls in some places, but in others breaks down to a chaotic arrangement of fragments.

### **13. Tuff Dyke**

This intrusion has a north-easterly trend. Its extent at H.W.M. is obscured by sand, but where first seen it is about 12 m wide narrowing seawards to between 2 and 4 m, finally wedging out in an easterly direction among beds of massive sandstone. The tuff is red with patches of green and yellow basalt and a few bombs of crystalline material. Near the margins it is enriched with fragments of local sandstone up to 30 cm long, and arranged with their long axes parallel to the sides of the dyke. Hair fractures, picked out by red hematite, traverse the steep irregular sandstone walls and the finer constituents of the tuff penetrate raggedly for short distances along these. It is supposed that although the intrusion is not continuous with the Coastguard Station Neck and its filling is differently constituted, the two bodies may have been connected at a lower level before the

subsidence of the neck.

## 14. Kirk Hill Neck

The Kirk Hill Neck is cut off to the east by the Dunbar-Gifford Fault, but to west and south the margin is vertical and has an irregular outline. The neck filling is again similar to the tuffs of the Old Harbour and bedding is more apparent towards the margins than at the centre. The strike of the bedding is approximately parallel to the neck margin to east and west, but adjacent to the southern margin the strike is variable. The bedding is vertical in the east, but dips westwards away from the centre of the neck at 40-70° in the west. In the north-western part of the neck there is a raft of sandstone measuring 2.5 x 6 m and south-west of the raft there is a 30 cm dyke of sandstone. The latter does not contain flow-banding like the dykes of the Parade Neck. At the indented south margin, tongues of red tuff penetrate the brecciated sandstone wall-rock and the yellow lapilli in this tuff are clearly aligned in flow structure against the sandstone.

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