Excursion 3 Milngavie and Mugdock

Key details

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Themes	Clyde Plateau Lavas, Craigmaddie Sandstone, dolerite sills and dykes, topography.
Features	Sandstones and conglomerates, porphyritic basalts, dolerite sills and dyke, jointing, fault valley, scarp and dip, roche moutonneé.
Maps	OS 1:50 000 Sheet 64 Glasgow; OS 1:25 000 Sheet NS47/57 Milngavie; BGS 1:63, 360 Sheet 30 Glasgow
Terrain	Easy walking, mainly on paths or roads.
Distance and Time	Total distance if walked as a round trip is 8 km (5 miles). If a car is used then walking is about 2 km (1.25 miles). Suitable for a half-day or a long summer evening.
Access	Locality 1 is on Water Board property; phone Area Engineer, Loch Katrine Area (041) 336.5333 for permission which is willingly given. Localities 5–9 are on a Scottish Wildlife Trust reserve which has public access at all times. Mugdock Wood is an SSSI of biological interest but again there is no access problem.

Locality 1. Milngavie Reservoir: Craigmaddie Sandstone. (Figure 3.1)

Take the Mugdock road from the centre of Milngavie and park near the western entrance to Milngavie reservoir [NS 555 763]. Cross the bridge over the reservoir and turn right along the cart track immediately beyond the water-side path. As the track turns left and a house comes into view turn obliquely left along a narrow path which passes behind the house and turn left again, uphill, behind the houses into a seemingly dense thicket of rhododendrons. The path quickly becomes an easy track which leads up to the quarry at the top of the hill [NS 558 761]. On the way several small quarries can be seen to the right of the track. These, and the main quarry at the top, were worked for the sandstone which can be seen in the walls and buildings around the reservoirs. Dolerite was also quarried. The lower face of the quarry shows about 6 m of uniform, medium-grained, rather soft siliceous sandstone which has a particularly shiny appearance in hand specimen.

Black plant fragments can occasionally be found. Bedding planes are not particularly obvious but there are two sets of joints approximately perpendicular to each other which can be seen in the quarry face. This is the Craigmaddie Sandstone. At the far end of the quarry it is possible to get on to the ledge formed by the top of the sandstone and inspect the dolerite sill which forms the upper 4 m of the quarry face. Unfortunately the contact cannot be seen but can be located to within about 0.5 m. The dolerite is highly weathered in hand specimen and is characteristic of the Milngavie sills confined to a small area between Mugdock and Milngavie. These are always, even in boreholes, highly altered. In thin section they can be seen to be olivine-free dolerites. The sill shows quite well developed columnar jointing. The different patterns of jointing in the sandstone and the dolerite are quite distinct.

Locality 2. Fault Valley

The pronounced valley which runs E–W for several kilometres immediately north of the reservoir is very straight and has been eroded along a fault. Here, the Craigmaddie Sandstone to the south is faulted against the Clyde Plateau Lavas to the north and the downthrow is to the south.

Return to the entrance and drive up the hill to the East Car park of Mugdock Country Park [NS 557 774]. If walking, go up the road as far as the hairpin bend, noting the sill exposed at the corner, and continue straight on into the park. Following the signs to the car park, note an old quarry in a wide vertical dyke [NS 554 770] in a private garden to the right of the path and a line of lava crags to the east of Mugdock Loch.

Locality 3. Porphyritic basalt

This rock is exposed immediately opposite the entrance to the car park. This is one of the flows of the Clyde Plateau lavas and shows large (1 cm) phenocrysts of plagioclase feldspar. It is thus a basalt of Markle type. The jointing is irregular and the exposure shows some spheroidal weathering towards the top. Numerous lines of lava outcrops, forming prominent crags can be seen in the area. It is noticeable that rock is very near the surface here. There are very few glacial deposits here and it was in general an area of glacial erosion.

Locality 4. View

Walk SE along the road until a good view to the north can be seen near the crossroads [NS 559 774]. (Figure 3.2)

Locality 5. Top of lavas

Return to the car park and drive east taking the second left turning at the cross roads, or walk along this road to its junction with the main road A81. Park here and enter the field to the east of the road and look at the rock outcropping in the trees near the gate [NS 566 772]. This is again a basaltic lava flow. None of these flows is as highly altered as the dolerite of the sills. Walk through the trees towards Loch Ardinning following the line of lava crags as they dip gently to the east. Continue east along the loch shore to an exposure in the next group of trees.

Locality 6. Conglomerate

The rock face at this exposure is in an unstable condition: it is safer to examine by eye rather than by hammer. Coarse, cross-bedded conglomerates with some sandstone beds, clearly very different from the lavas, are exposed.

Locality 7. Conglomerate

Walk SW along the edge of the wood where similar rock crops out as far as the corner at which point they can be easily inspected. The sediments at both these localities are the basal conglomerates of the Craigmaddie Sandstones which overlie the lavas. The pebbles are almost entirely of well rounded quartz. Notably, although they overlie the lavas, no obvious volcanic detritus from this source is visible. Both the bedding and the type of sediment suggest that these sediments were deposited by a braided stream flowing south from the Highlands. The conglomerates are common near the base of the Craigmaddie Sandstone but thin out both vertically and to the south. The higher beds are more uniformly sandy as was seen at Locality 1.

The relationship between the top lava and the basal conglomerate can be appreciated here although the contact is not visible. A series of westward facing scarp-faces mark the layers while the more gentle dip-slopes face east. This relationship can be particularly well seen looking south from Locality 9, at the north end of the loch, (Figure 3.1). Although the contact between the lavas and the sediments is not visible it must run somewhere across the field. Standing in this field and looking north to the Campsie Fells it is easy to appreciate the magnitude of the Campsie Fault as you stand on the highest lava and look across to the lowest i.e. there must be a downthrow of some 1000 m to the south.

Locality 8. Dyke and roche moutonnée

Now walk south across the field to a farm track. This follows the line of a quartz dolerite dyke about 5 m wide. The dyke forms a feature above the general level of the field and can be followed for several kilometres; it was quarried on the

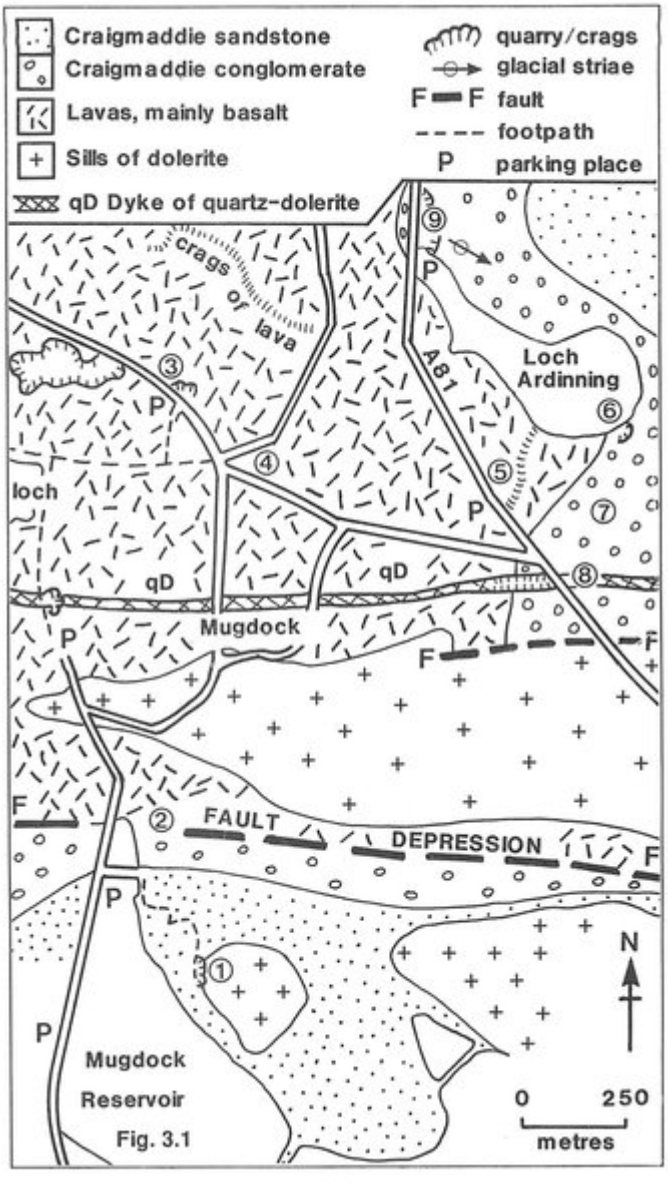
other side of the road and also near Mugdock (see earlier reference to the walk through the park). The surface of the dyke is very smooth. It is a roche moutonnee and this is a glacially polished surface although 110 glacial striations can be seen here. The age of both the dyke and sills must be later than the Clyde Plateau Lavas as they cut the sediments above the lavas. They are probably of late Carboniferous age.

Locality 9. Craigmaddie Quarry

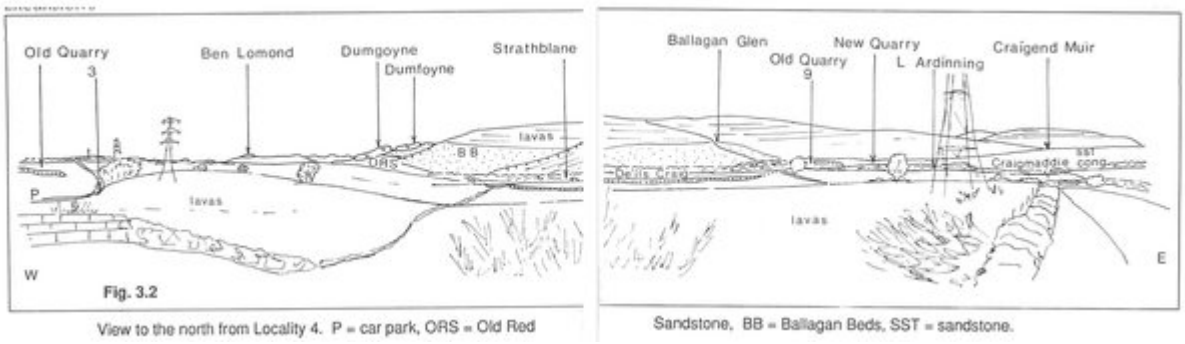
Conglomerates and sandstones of the Craigmaddie Sandstone are well exposed here and show good sedimentary structures. Walk to the top of the quarry where a good general view of the scarp and dip slopes and the general topography can be seen. On the upper surface here are striations pointing to the SE and it is easy to imagine the ice grinding its way over the surface. On a clear day there is an excellent view of the Campsie Fells of Clyde Plateau Lavas, relatively uplifted north of the Campsie Fault, with Dumfoyne and Dumgoyne to the left and the Highlands beyond.

References

CLOUGH, C.T. etal 1925. The Geology of the Glasgow District. Mem. Geol. Surv. U.K.



(Figure 3.1) Simplified geological map of the Milngavie and Mugdock area.



View to the north from Locality 4. P = car park, ORS = Old Red Sandstone, BB = Ballagan Beds, SST = sandstone.

(Figure 3.2) View to the north from Locality 4. P = car park, ORS = Old Red illustrates this view.