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## Chapter 24 Tertiary basic plugs and sheets of north-west Mull

A few dolerite plugs and basic sheets occurring in North-west Mull are lettered respectively eD and I on one-inch Sheet 51. They have been already dealt with in the memoir concerned with the Island of Mull as a whole, <ref>G. V. Wilson and H. H. Thomas in Tertiary Mull Memoir, 1924, pp. 156, 157, 160, 161, 292, 294.</ref> and the descriptions there given are repeated below.

### Dolerite plugs, 'S Airde Beinn and Loch Frisa

A volcanic plug forms the hill of 'S Airde Beinn, about 3 miles east-north-east of Dervaig. Good illustrated descriptions have been given by Prof. Judd<ref>J. W. Judd, The Secondary Rocks of Scotland. Second Paper, On the Ancient Volcanoes of the Highlands and the Relations of their Products to the Mesozoic Strata, *Quart. Journ. Geol. Soc.*, vol. xxx., 1874, pp. 264–266;</ref> and Sir Archibald Geikie.<ref>Sir A. Geikie, Ancient Volcanoes of Great Britain, vol. ii, 1897, pp. 274–276.</ref> From the hills south of Loch Meadhoin the plug is seen as a large knob of rock protruding with more or less vertical walls out of the surrounding almost flat lava-flows. What immediately strikes the eye from this point of view is the fact that the knob contains a central depression, the site of a picturesque lochan. There is little wonder that this hollow is often wrongly interpreted as the crater of an extinct volcano. If one approaches the hill from the north-east, the intrusive nature of the mass is well demonstrated by the fact that the edges of several flows of basalt are seen to terminate abruptly against the vertical wall of the plug.

Let us now examine this intrusive mass in detail. It is found to run north-north-west with a maximum length and breadth of 950 and 430 yds. respectively. Except for a short distance at the south-eastern corner, where the overflow-stream from the loch emerges, it has an almost vertical wall of complex nature. On examination the material that forms the outer edge of this wall is seen to consist of a fine-grained hard splintery rock, which in places shows good amygdaloidal structure. Under the microscope this outer portion proves to be the same type of basalt as that of the surrounding lava-flows, only in an altered condition due to its having been baked by the intrusion of the volcanic plug. No abrupt junction can be seen between this altered basalt and the dolerite of the plug; in fact, the one passes almost insensibly into the other. Apparently the temperature of the molten dolerite in the plug was sufficient to melt up the edge of the adjoining basalt lava, with a consequent local mingling of material from the two sources. The dolerite, followed in from its edge towards the loch, is seen to become gradually coarser in grain for a certain distance, and then to retain an almost uniform texture throughout.

The origin of the central loch now demands our attention. No rock except dolerite is exposed near its margin, and this dolerite is not different in composition from that 20 yds. or so away from the edge of the loch; nor are any fragments of ashy material exposed along the shore. The only visible reason for the presence of the loch is the occurrence of a north-north-west line of fracture, which can be traced for miles across the country, and is well seen in a cleft, on the northern face of the hill. At the south-east end the stream from the loch emerges through an opening along the same line of fracture, so that in all probability the hollow of the loch has been eroded in a belt of shattered dolerite determined by faulting.

A mile and a half north-north-west from 'S Airde Beinn, and on the south side of a road, a small plug forms a prominent crag known as Cnoc a' Chrocaire. It is only about 100 yds. in diameter, and is cut by a thin dyke and an irregular sheet of fine-grained dolerite.

In the other direction, a mile and a half south-south-east of 'S Airde Beinn, there are two more small plugs of dolerite outcropping above Loch Frisa. The more southerly is interesting as showing good almost horizontal columns. It is a medium to coarse-grained dolerite.

### Petrology

The rock forming the plug of 'S Airde Beinn ([S18064](#)) [NM 4717 5393] is a remarkably fresh dolerite composed of olivine, augite, labradorite, and magnetite. The olivine is either fresh or partly converted into bright-yellow iddingsite. It is a moderately abundant constituent, builds fairly large irregular individuals, and appears to be in part of earlier and in part of later generation than the feldspars. The feldspar is a zoned basic labradorite that occurs in somewhat small stumpy crystals, two or three times as long as they are broad, and is optically enclosed by large crystals of slightly titaniferous augite. A second generation of augite of acicular habit, and in close association with minute crystals of magnetite, occurs in a chloritized residuum that fills all interspaces between the feldspars not already occupied by the earlier ophitic augite.

This rock, in its felspathic nature and in the mode of occurrence of the augite, has points that connect it genetically with some of the pillow lavas of Central Mull. Specimens illustrating its metamorphic action on the basalt lavas with which it is in contact are easy to obtain ([S18065](#)) [NM 4700 5366], ([S19268](#)) [NM 4713 5416], and they show that the dolerite has produced more or less complete granulitization of the older rocks. In a compact basalt ([S18065](#)) [NM 4700 5366] much granulitic augite has been formed, biotite has been produced around iron-ores, and there has been thorough recrystallization of the feldspar microlites. In another specimen, an amygdaloidal basalt ([S19268](#)) [NM 4713 5416], the granulitization is equally well marked, and lime-zeolites that occupied the vesicular cavities have, in all cases, been converted into feldspar of corresponding composition.

## Basic sheets

A sparse development of thin tholeiitic sheets is found along the coast of North-west Mull, between Caliach Point and Ardmore Point, and extends from there inland for a couple of miles. The sheets belong, on account of their position, rather to the intrusive complex of Ardnamurchan than to that of Mull, and may be stragglers from the Cone-sheet Complex of the Ardnamurchan district. In their frequently north-west direction they repeat the tendency of cone-sheets of the earliest Centre 1n Ardnamurchan met with along the outermost (eastern) margin of the complex, where many individuals are in part at least injected along north-west fissures (p. 176). The sheets may be described as irregular sills with a marked transgressive tendency. They dip, throughout most of the area, towards the south-west; but, at Caliach Point, they incline in the opposite direction, towards the east or north-east. Sir Archibald Geikie, in his *Ancient Volcanoes* (vol. ii., p. 158), has figured an example, from Caliach Point, cut through by a northwest dyke.

Only one specimen has been sliced. It comes from the west side of Ardmore Bay ([S19267](#)) [NM 4606 5885], and is thoroughly fine grained, suggesting a rapidly cooled rock of tholeiitic composition. In the field the sheets are often found to weather spheroidally.