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## Chapter 23 Dykes of Coll

Post-Lewisian dykes are fairly numerous in Coll. Most of them are of Tertiary date, though, as we shall presently see, a fair proportion may be Permian, and two or three may be of Lower Old Red Sandstone age. The south-east coast of Coll is about 12 miles long, and is divided into two equal portions by Loch Eatharna. Seventy dykes have been mapped on the northern half of this coastline, and sixteen on the southern half. Exposures are rather better in the northern half, and the average thickness of dykes mapped there is only about 2.5 ft. as compared with 4 ft. farther south — which suggests that several thin dykes are hidden in the south; but it is quite clear that dykes are relatively abundant in the north end of the island. In fact, it is obvious that in this direction Coll projects for some distance on to the course of the Mull Swarm of Tertiary north-west dykes.

There are some local exceptions to the general rule that dykes are more numerous the farther north we go in Coll. For instance, seven of the dykes of the southern half of the south-east coast-line are concentrated into a distance of 200 yds. at Rudha Fasachd, east of Loch Breachacha (only two are shown on the one-inch Map).

There are two main petrographical classes represented among Coll dykes, namely, basalt and camptonite, and they are very often distinguishable in the field. There does not, however, seem to be any corresponding difference of trend. The prevalent dyke direction, irrespective of composition, is west-north-west. This is distinctly west of what is commonly noted among the north-west dykes of Mull. Individual dykes in Coll are only seen for a few yards where they cross coast sections. In this position they have often been worn away to give little 'chasms' or 'geos' between walls of the more resistant gneiss. Inland the dykes are scarcely ever visible, for they are commonly hidden under superficial deposits, even where adjoining gneiss is bare.

The great majority of Coll dykes reproduce in their field appearance the characters of the Tertiary basalt dykes so abundantly seen in Mull. Accordingly very few have been sliced. In [\(S22149\)](#) [NM 2653 6112] one of them, an ophitic olivine-basalt of the Mull Plateau Type, fresh olivine is abundant in crystals that seldom reach 0.5 mm. in length; labradorite has a lath habit, shows an ill-defined microporphyritic structure, and measures in its larger individuals about 2 mm.; purple augite is ophitic; and magnetite accessory.

Another of the undoubtedly Tertiary dykes proves on slicing to be of the Mull Porphyritic Central Type [\(S22158\)](#) [NM 2712 6213]. It contains fairly numerous tabular phenocrysts of bytownite, measuring 2 or 3 mm., and a few fresh olivines in a very augitic base; the augite is brownish and builds contiguous grains penetrated by felspar laths the latter showing a microporphyritic tendency; again iron-ore is accessory.

A dozen camptonite dykes have been recognized in Coll, along with two others more nearly approaching monchiquite. Almost all of them have been sliced. They are thoroughly basic rocks. In the field they closely resemble basalts, but are distinguished by a tendency to show pinkish feldspathic spots, or ocelli, containing needles of hornblende or flakes of biotite. The value of such ocelli as a means of field diagnosis was first recognized in the West Highlands by the late Dr. C. T. Clough. The directions of the Coll camptonite and monchiquite dykes are as follows: one dyke runs north-north-west, four north-west, three west-north-west, three west by north, two east-west, one north-north-east. No contact between camptonite and basalt dykes has been noted in the island, though several intersections of camptonite by basalt have been recorded in other parts of the West Highlands.

The Coll camptonites aim at the Tertiary lava fields of Mull, where basalt dykes abound and camptonite is almost unrepresented.

The local evidence therefore suggests a pre-Tertiary date. If this view be adopted it is natural on petrographical grounds to class them with the Permian rocks of Western Scotland as exemplified in Ayrshire. The question of age cannot, however, be decided on any evidence that has been obtained up to date. It involves many considerations which have been developed, more especially, in the writings of Sir J. S. Flett, who originally demonstrated the occurrence of true camptonite in Scotland. For a recent survey of the evidence bearing on this question the reader may turn to Chapter XXXV of the Tertiary Mull Memoir.

Petrographically the Coll camptonites contain olivine (represented by pseudomorphs), augite, hornblende, occasional biotite, plagioclase and cloudy indeterminable feldspar, and magnetite in variable proportions, with apatite as an important accessory. The ocelli may include hornblende, biotite, feldspar (including cloudy alkali-feldspar), chlorite, serpentine, calcite, and more rarely analcite. The structure is typically panidiomorphic, and there is a strong tendency for the development of two generations of augite.

Olivine has been present in all cases, though often in quite small amount. It is always decomposed. The pseudomorphs are fairly well formed and occasionally range up to 3 mm. in length ([S21325](#)) [NM 2354 6339], ([S21326](#)) [NM 2306 6296], ([S22156](#)) [NM 2772 6481].

Augite is pale-brownish in colour with a slight to strongly marked purplish shade. Hour-glass zoning is sometimes apparent ([S22155](#)) [NM 2264 5688], ([S22156](#)) [NM 2772 6481]. Porphyritic structure is frequent, with phenocrysts of stout prismatic form measuring exceptionally 3 mm. in length ([S21325](#)) [NM 2354 6339]. The augite of the ground-mass generally occurs in almost equi-dimensional grains of stout prismatic form, often measuring about 5 mm. Narrower prisms are also found ([S21406](#)) [NM 1799 5312], ([S22148](#)) [NM 2670 6148]. The augite is very rarely decomposed ([S21326](#)) [NM 2306 6296].

Hornblende in the main body of the rock is always fresh and deep brown. It usually occurs as stout stumpy prisms about 0–5 mm. long, in part moulded on the augite. Sometimes it has grown almost altogether independently of the augite, and in one slice its prisms reach 2 mm. in length ([S21406](#)) [NM 1799 5312]. As a rule there is, roughly speaking, as much hornblende as augite in Coll camptonites.

Biotite is generally very subordinate and may even be absent. It is never the main ferromagnesian mineral, but occasionally ([S22148](#)) [NM 2670 6148] it exceeds hornblende in abundance. Its colour is brown, and its pleochroism almost reaches black.

Feldspar generally occurs with a lathy form, but sometimes it builds plates enclosing other constituents. It may be fairly fresh, and seems to be chiefly zoned plagioclase ranging to about labradorite in its more basic parts ([S21325](#)) [NM 2354 6339], ([S21326](#)) [NM 2306 6296], ([S21327](#)) [NM 1870 5952], ([S21407](#)) [NM 1255 5423]. In one slice ([S21406](#)) [NM 1799 5312] cloudy alkali-feldspar in the base may be secondary. In others ([S21408](#)) [NM 1558 5653], ([S22148](#)) [NM 2670 6148] a turbid base occurs which may at one stage have been feldspathic.

Magnetite grains are always abundant and minute apatite needles are common.

Relatively feldspathic ocelli are illustrated in several of the slices. Olivine and augite are not found in these ocelli. Hornblende tends to be acicular and to show greenish tints ([S21408](#)) [NM 1558 5653], ([S22151](#)) [NM 2634 6084], ([S22156](#)) [NM 2772 6481]. Biotite is a little commoner than it is outside ([S21325](#)) [NM 2354 6339], ([S22147](#)) [NM 2670 6147], ([S22148](#)) [NM 2670 6148]. Feldspar may build stout laths ([S21325](#)) [NM 2354 6339], ([S21407](#)) [NM 1255 5423], ([S22147](#)) [NM 2670 6147], ([S22151](#)) [NM 2634 6084] or fine feathery growths ([S21408](#)) [NM 1558 5653], ([S22148](#)) [NM 2670 6148]. The former are in part fresh, moderately basic plagioclase. The latter are clouded or decomposed. Calcite and chlorite are common minerals, and clear analcite is well represented in one slice ([S22148](#)) [NM 2670 6148].

The exposures of most of the sliced camptonites are indicated by the letter C on the one-inch Map. A very good example is seen on Loch Eatharna shore, 100 yds. south of Arinagour pier.

As already mentioned, two monchiquitic dykes are known in Coll, and both are represented by slices ([S21328](#)) [NM 1772 5913], ([S22157](#)) [NM 2704 6196]. One of them comes from the north-west coast, 500 yds. west-north-west of Clabhach Church. It shows a strong concentration of ferromagnesian minerals: fresh olivine, purplish augite, and hornblende. In the very scanty base, minute prisms of feldspar can be seen, while magnetite is an important accessory.

Three dykes that appeared in the field to be of exceptional type may here be mentioned. The first is a basaltic-looking dyke, 3 ft. wide, with a course just north of west. It crosses the head of Bagh na Coille, near the north end of the island. A carbonate vein runs along the side of the dyke and penetrates it, altering it to a pale-green rock. Under the microscope a comparatively fresh specimen ([S26748](#)) [NM 2714 6265] shows clear plagioclase laths, probably mostly more acid than

labradorite, small brown flakes of biotite, and grains of iron-ore; while other ferromagnesian, certainly including olivine, are represented by pseudomorphs, largely composed of carbonate; amygdales show chlorite and carbonate. In a more altered specimen close to the vein [\(S26749\)](#) [NM 2714 6265], carbonate and chlorite have replaced all original minerals except iron-ore. Similarly altered east and west dykes have been noted cutting the Moine Schists of Ardnamurchan (Acharacle district). On the open coast, east of the same bay, there is a small discontinuous pale dyke of non-basaltic appearance. It has not been sliced, but it closely resembles a 4-ft. west-north-west dyke that crosses the shore east-north-east of Meall nan Uan. A slice of the latter [\(S22146\)](#) [NM 2663 6122] shows highly decomposed rock suggestive of certain lamprophyric types common among Lower Old Red Sandstone intrusions of the West of Scotland. Possibly all three dykes mentioned in this paragraph may belong to the Lower Old Red Sandstone suite. E.B.B., V.A.E., J.B.S.