Excursion 4 Sanna Bay to Rubha Carrach

(Map) Map of the Tertiary igneous complex of Ardnamurchan

This short excursion allows an examination of the granophyric quartz-dolerite. hypersthene-gabbro and outer cone-sheets of Centre 2, an agglomerate related to Centre 1, and the gabbro of Plocaig (Centre 3). Along the coast between Sanna Bay and Sanna Point a series of sills of granophyric quartz-dolerite can be seen cutting the hypersthene-gabbro. Also in this area the best examples of mineralogical layering in the hypersthene-gabbro intrusion are seen. On the north coast, east of Rubha an Duin Bhain, the hypersthene-gabbro contains occasional acid xenoliths and at its contact with the Middle Liassic sandstone an interesting pseudo-beccia is developed. From the Glendrian Caves to Rubha Carrach the magnificent sea cliff shows tuffs and coarse agglomerate. Low tide is advisable for this excursion.

Total distance (Sanna–Sanna) about 7 km.

From Kilchoan follow the road to Sanna. At Sanna Bay vehicles m'ay be parked just beyond the 'telephone kiosk. Follow the footpath inland of the sand' dunes northwards to the footbridge across the Allt Sanna immediately upstream from Burnbank. (This is a private bridge which may be used by the public. Users. however. are requested to make a contribution for aid to the handicapped. in t~e box provided on the bridge.) Proceed down the north bank of the stream to the shore .

Locality 1 [NM 443 697]

Below high water mark alongside the Allt Sanna a series of exposures show granophyre containing inclusions of both aphyric and porphyritic dolerite and hypersthene-gabbro. The inclusions of aphyric dolerite occasionally show the development of a dark margin against the granophyre. At its northern limit., the granophyric quartz-dolerite can be seen to dip steeply northwards beneath the hypersthene-gabbro.

Locality 2 [NM 441 699]

Continue along the coast westwards for about 300 m and then northwards for about 150 m. across. the root of a small peninsula, to a sandy bay where exposures of a sill of granophyric quartz-dolerite are again present.

Locality 3 [NM 441 700]

In the area about 100 m north of the sandy bay, the hypersthene-gabbro shows the best examples of perfectly developed mineralogical layering in the intrusion. The layers. which dip south at angles between 100 and 200, are formed by variation in the proportion of those minerals normally found in the rock, namely plagioclase feldspar, augite, hypersthene, olivine and magnetite. Although the compositional variation is usually slight, occasional bands of anorthosite, peridotite and iron ore are found. Slight textural changes accompany the mineralogical variations, and a degree of preferred orientation of the feldspar crystals is usually developed parallel to the layering, which is best seen where the layering is more steeply inclined. Although the sequence of layers is usually haphazard, a succession occasionally develops comprising a lower group containing distinctive clustered aggregates of olivine (giving a curious pock-marked appearance to the weathered rock), and an upper group which is characterised by the presence of rather shattered plagioclase phenocrysts. In some places rhythmic banding, produced by variation of the feldspar/pyroxene ratio, is also present. Some olivine-rich bands afford textural evidence for gravity accumulation of the olivine.

Locality 4 [NM 441 704]

Continue northwards across hypersthene-gabbro with a sporadic development of fine net-veining by granophyre and containing the occasional rounded xenolith, to the wave-cut platform on the coast about 200 m north of the cairn marking the high ground of Sanna Point. At this point a sub-horizontal sill of granophyre with aphyric dolerite, about 1 m thick,

cuts the hypersthene-gabbro.

Locality 5 [NM 449 703]

Regain the top of the cliffs and follow the coast eastwards for about 800 m to the fort of Duin Bhain and thence to the sandy bay about 150 m south-east of the fort. The boundary between the hypersthene-gabbro and a cone-sheet complex passes roughly east to west through this bay. To the north is the high ground of Duin Bhain, in which individual cone-sheets prove difficult to reco~nise, but occasional bands of Jurassic sandstone withm the complex allow the recognition of a number of discrete intrusions. Separating this complex from the marginal quartz-dolerite facies of the hypersthene-gabbro is a granophyre sheet containing crystals of plagioclase feldspar and augite in a matrix of micrographic quartz and feldspar. To the south of the bay the marginal facies passes into normal hypersthene-gabbro.

Locality 6 [NM 451702]

Follow the coast eastwards, keeping below high water mark, for about 200 m. where occasional rounded masses, up to about 10 cm in diameter, of acid material occur within the hypersthene-gabbro. These may represent xenolithic blocks of Jurassic sandstone.

Locality 7 [NM 453 700]

Continue south-eastwards along the coast to the rocky bay north of Plocaig. On the west side of the bay, to the south of a small high water island, the hypersthene-gabbro is invaded by a mass of granophyre which net-veins the gabbro. The mass has inclusions of fine-grained basic rock and appears to be both cut by and cutting a steeply dipping sheet of similarly fine-grained basic rock. Although having an east–west outcrop the granophyre is difficult to trace westwards, but on the east side of the bay, slightly to the north of its projected strike position, the granophyre displays a sheeted form about 2 m thick dipping to the south at about 400 and extensively net-veining the overlying hypersthene-gabbro. The granophyre is composed of crystals of zoned plagioclase feldspar (labradorite to oligoclase) and augite, in a matrix of quartz and alkali feldspar showing some micrographic texture. This intrusion may represent a unique acid cone-sheet of the Centre 2 suite, but, more probably, is related to the granophyric quartz-dolerite sills which outcrop within the hypersthene-gabbro further to the west.

Locality 8 [NM 460 703]

Follow the outcrop of the granophyre sheet eastwards for about 400 m to a sandy bay (beware of areas of quicksand), and then north-eastwards across the dark-coloured hypersthene-gabbro for a further 300 m to the lighter-coloured quartz-bearing marginal facies of the gabbro. The actual margin of the intrusion trends north-west to south-east across the shore. In this immediate area the character of the margin is intrusive, but this gives way inland to fault-controlled contact. Interesting acid xenoliths, probably of Jurassic sandstone, have been recorded as occurring within the gabbro about 5 m from the contact just above high water mark. Of even more interest, however, is the presence of a curious "breccia", best seen below high water mark. immediately outside the gabbro boundary. The rock consists of light-coloured angular fragments up to a few centimetres in length. composed of sutured quartz grains which are invaded by irregular veinlets of feldspar and quartz. set in a fine-grained matrix which is also light coloured. The amount of feldspathic material in the fragments increases towards their margins and the "breccia" is considered to have resulted by feldspathization of the Jurassic sandstone host. The breaking up of some fragments and the occasional development of chlorite around the fragments has been attributed to mobilisation.

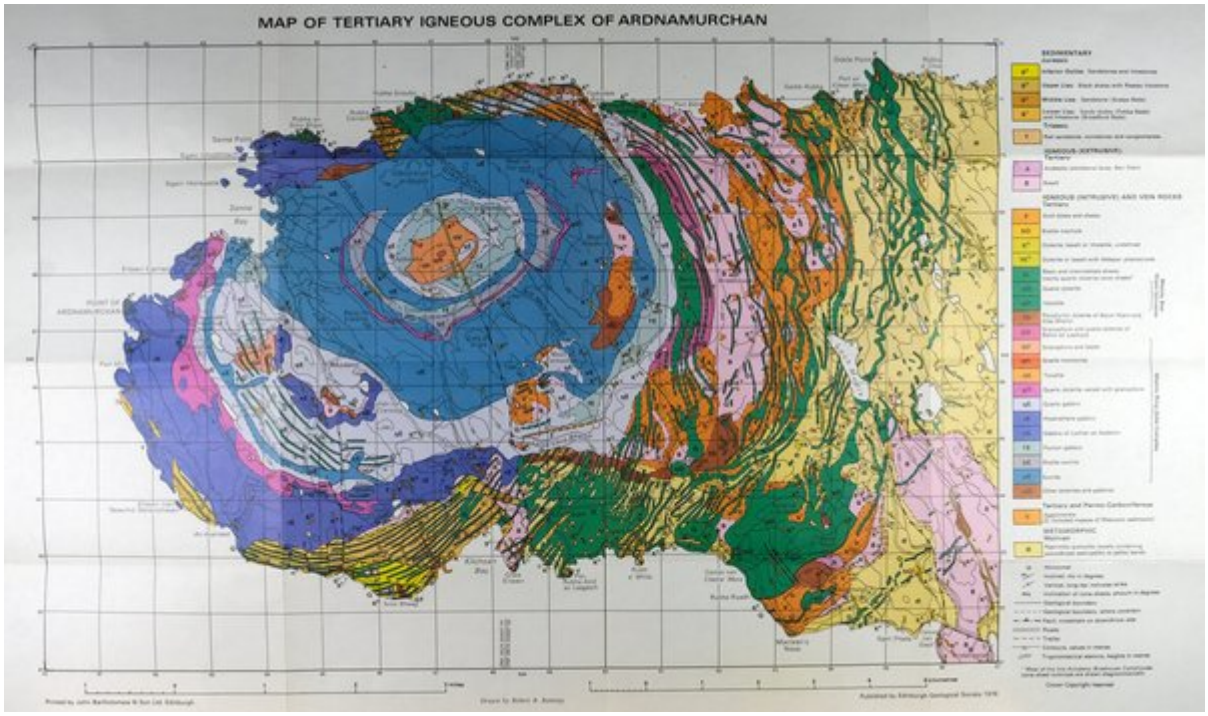
Locality 9 [NM 461 705]

Continue north-eastwards along the shore, crossing Middle Liassic sandstone cut both by numerous cone-sheets of the outer suite of Centre 2 and by olivine-bearing basic dykes. to Glendrian Caves. The seacliff forming the western shore of Rubha Carrach is composed of coarse agglomerate and tuff. In addition to fragments of Mesozoic sediments and basaltic lava. these volcanics contain some acid material, suggesting that the vent explosions may be associated with the formation of an acid magma. The agglomerates and tuffs are cut by the cone-sheets and the basic dykes.

Locality 10 [NM 455 698]

Return south-westwards along the shore to the sandy bay. Continue along the cliff top westwards for about 150 m until a marked north–south gully is reached. Follow the top of the gully southwards to Its termination and thence for about a further 250 m alongside a north–south artificial dyke to an isolated rocky outcrop which lies about 250 m east of Plocaig. Here the gabbro of Plocaig is exposed. This small, elongate mass extends for a short distance between the hypersthene-gabbro and the Great Eucrite. and appears to be a distinct intrusion from both its neighbours. It is a coarse olivine-gabbro containing xenoliths of hypersthene-gabbro, generally considered to be related to Centre 3.

References



(Map) Map of the Tertiary igneous complex of Ardnamurchan