

Excursion 12: Largybeg to Bennan

((Figure 16), localities 1 to 16)

The object of this excursion is to examine the Triassic sediments of the southern part of Arran and the large number of Tertiary sills and dykes which occur there.

Approach Largybeg Point by the road leading from the main road at Largybeg, noting *en route* a good exposure of red and green sandy marls and sandstones dipping to the south-southwest. At the point where the road meets the cliff-top a thin sill of quartz-dolerite is seen.

1. [NS 0548 2328] At the northeast end the Largybeg Point section is terminated by a composite sheet which appears to dip steeply northeastwards and to cut transgressively across the sediments. The lower member of this intrusion is a light-coloured acid craignurite. This rock encloses elongated vesicles filled with a dark greenish substance which has been referred to chlorophaeite. The upper member, which is locally of considerable thickness, is a quartz-dolerite *aff.* Talaidh type. To the southwest lies the shore section described and figured by Tyrrell (1928, pp. 88–90 and 1915, p. 191). This section in descending order is as follows:

	<i>metres</i>
a. Thin-bedded red sandstone	12.8
b. Composite sill	4.6
c. White gritty sandstone, with line of local unconformity and rock-arch	10.0
d. Coarse grit with bands of conglomerate	2.7
e. Conglomerate	2.0
f. Carious white sandstone	2.7

These rocks dip at 15° or so to the southwest. They are cut by basaltic dykes, the one terminating the above section to the southwest forming a fine wall which stands up to 7.5 m above the shore.

The conglomerates are worthy of notice as they are of a type uncommon in the New Red Sandstone of Arran. As noted by Tyrrell the pebbles consist mostly of white and pink vein-quartz and quartzite with some of red feldspar porphyry, flinty quartz-felsite, grey mudstone, red sandstone and chert. He has recorded dreikanter which have suffered water erosion subsequent to wind-faceting and has noted that, while the igneous and quartz pebbles are generally well-rounded, the matrix is a coarse sandstone consisting mainly of rounded and polished grains of quartz with an occasional cleavage fragment of fresh feldspar embedded in a whitish decomposed feldspathic matrix. This suggested to him that the conglomerate represents an accumulation of pebbles and sand brought together by occasional rain bursts in a desert or semi-desert region. Many of the pebbles have a distinctly Lower Old Red Sandstone appearance.

The composite sill (b) has margins composed of acid craignurite and a centre of feldspathic dolerite. The marginal rocks enclose vesicles filled with an olive-green mineral (?chlorophaeite). In addition, the lower member holds vesicles filled with amethystine quartz. The dip of this intrusion is to the southwest, in conformity with the country rock. The two Standing Stones, erected on the landward extension of the sill, are composed of local pebbly sandstone.

2. [NS 0523 2297] On the foreshore a short distance southeast of the little cottage south of the Standing Stones two beds of sandstone contain numerous "nests" of clear crystalline calcite in cavities.

These are of all shapes and sizes up to as much as 15 cm in diameter. The horizon of this locality is close to the junction between the Lamlash Beds and the Auchenhew Beds (p. 37).

Some 275 m southwest of Largybeg Point and near Port na Gaillin the foreshore is crossed by an irregular sheet of dolerite which bakes and disturbs the sediments. The latter lie just below the horizon taken as the base of the

Auchenhew Beds. They consist of sandstone, generally red and soft, sometimes ripple-marked, and purplish shales or mudstones. The first dyke to the southwest of the dolerite sheet is split into four members by screens of sandstone baked to quartzite.

3 [NS 0522 2257] At this point the Dippin analcime-dolerite runs out to sea. A tholeiite dyke rises vertically through it, showing well-developed cross-jointing which contrasts strikingly with the vertical columnar jointing of the sill. The dyke shows good chilled margins. Just southwest of the angle of the cliff at the dyke, a mass of hard, purple, micaceous sandy mudstone is enclosed in the dolerite, with the development of the usual basaltic contact rocks. Northeast of the dyke and a little below high water mark a small patch of quartz-dolerite rests on sandstone with numerous ripple-marks. The attitude of the margin of the Dippin intrusion here is a matter for conjecture. Some 200m to the south-southwest the old sea-cliff of analcime-dolerite is cut by a 1.6m sill of typical quartz-dolerite.

Good fresh specimens of the Dippin sill are readily obtained. In hand specimen, plagioclase feldspar, augite and olivine can be distinguished. Thin sections show laths of plagioclase, ophitic purplish titanite, olivine which is generally partly serpentinised, iron ores and interstitial analcime. The main road should be regained by the road leading from the Trareoch Hotel. By the side of this road are seen outcrops of red sandy micaceous marls.

4. [NS 0502 2280] At this point the road crosses landslip material which has fallen from the inland cliff, An Garradh. On the west side of the road the slip has exposed sediments cut by a thin sill of quartz-dolerite. Below the sill the sediments are red, sandy, micaceous marls with green spots. Just above the sill similar red marls occur followed upwards by grey and red marls with bands of calcareous nodules (potato stones). Against the marl the sill has developed irregular, chilled and banded margins. The sediments appear to be unaffected by the intrusion. This locality has yielded microfossils considered by Warrington (1973, pp. 109–116) to indicate a late Lower Trias or early Middle Trias age for the rocks.

5. [NS 0473 2276] Here two small quarries have been opened in the Dippin Sill. The rock is decidedly patchy. A darker dolerite encloses irregular masses of relatively light-coloured coarse-grained rock the latter being relatively rich in analcime (i.e. teschenitic). Locally spheroidal weathering is well marked. In both quarries the sill is cut by tholeiite dykes; these bear phenocrysts of calcic plagioclase, clino- and orthopyroxene, in a groundmass of these minerals; there is an abundant residuum of feldspathic material probably representing devitrified glass. On the southeast side of the more southerly quarry marginal rocks are seen in irregular but generally steeply inclined contact with the sediments.

6. [NS 0415 2180] On the way to Kildonan the road re-crosses the lower contact of the Dippin sill, the scarp edge of which is well marked running southwestwards parallel to and above the road. From this point on the road a good view of Pladda and, on clear days, Ailsa Craig may be obtained. The former island is largely formed of a sill of quartz-dolerite. The obvious low cliff is due to marine erosion in Main Postglacial Shoreline times.

7. [NS 0354 2092] Following the main road westwards from its junction with the road to Kildonan for 200m a strong feature is seen on the left. Examination of this shows that the upper margin of the Dippin intrusion (at grid ref. 039 220) cannot be concordant as contact rocks are seen to dip steeply east-northeast. Similar rocks occur on the southeast-facing scarp which crosses the fields (once Kildonan Golf Course) farther west. The intrusion here is an irregular sheet of analcime-olivine-dolerite, which may be referred to as the Columbkille intrusion.

8. [NS 0397 2096] In the neighbourhood of Kildonan the High Lateglacial Raised Beach platform is well developed. The seaward margin of this feature is formed by a sill of craignurite felsite, the flow-vesiculated central portion of which may be readily examined by the top of the steps which lead down to the shore a short distance east of the hotel. The Coastguard Station and the ruined Kildonan Castle both stand on this sill.

9. [NS 0207 2075] A traverse of the shore westwards towards Bennan Head will permit examination of Triassic sediments cut by a large number of basic dykes. The sediments are white and grey sandstones, often shaly and locally ripple-marked, with interbedded red, green and grey mudstones. They dip at low angles off an anticlinal axis which crosses the shore south of Levenacoroch. The cliffs backing the Main Postglacial Shoreline give good sections of the sediments. In addition to the types already mentioned as occurring on the shore, bands of calcareous concretions and nodular, impure limestones are also to be seen.

The dykes are numerous; between the Allt Mòr and Port a'Ghille Glais some 60 dykes cross the foreshore. The predominant direction of these intrusions is NNW–SSE with a few trending NW–SE and NE–SW. Their width varies from 30cm to 18m or so. Dyke complexes and multiple dykes occur. Intersections can be studied under suitable tidal conditions. Bifurcation can also be seen; in fact most of the phenomena attendant on dyke intrusion can be studied on this shore. So far as is known the rock-types present belong to the crinaitic and tholeiitic suites.

9a. [NS 0383 2091] An alternative to the section west of the Kildonan Hotel is to examine the dykes on the shore to the east. Although the frequency of dykes is less here this locality is otherwise quite representative. Also it permits examination of the broad dyke complex which crosses the shore in a N–S direction 0.5 km northeast of the castle. This body, which consists mainly of dykes of coarse alkali-dolerite, is interesting in being cut by at least one tholeiite, and appearing to truncate NW–SE dykes which include both alkali-dolerites and olivine-tholeiites. On its western side and just above high water mark is a thin sill of tachylite.

10 [NS 0371 2180] Although awkward of access, the gorge at Allt Mòr, just below the waterfall Eas Mòr (grid ref. [NS 020 222]), is worth a visit. The gorge terminates at the fall which lies at the centre of a fine amphitheatre. The cliff on the western side of this feature shows the thinning Columbkille analcime-dolerite resting on light-coloured baked sandstone and enclosing long rafts of the same material. This intrusion is overlain by a paler felsite-quartz-dolerite sill which runs round the amphitheatre, forming the lip of the waterfall. The analcime-dolerite peters out in marls before it reaches the fall beneath which the sediments are cut by small faults and narrow dykes.

11. [NS 0207 2205] The Levenorroch Burn provides an excellent section in marly and sandy sediments forming part of the upper division of the Trias (Auchenheew Beds). On the east bank of the burn, 275m upstream from the road-bridge, thick beds of marl with posts of sandstone outcrop. The marls weather to a characteristic cuboidal rubble. At the lower waterfall a thin basaltic sill is intruded into the sediments. Above this the stream flows in a small gorge the east wall of which shows marls with some sandstone, while the west wall shows preponderant sandstone. In the face of the waterfall at the head of the gorge a fault is clearly exposed. The above sediments are cut off upwards by the Levenorroch Hill—Auchenheew Hill quartz-dolerite sill which gives rise to the craggy scarps overlooking the main road.

12. [NS 0121 2190] At this point is an old quarry in the quartz-feldspar-porphyry which forms the central part of the Bennan composite intrusion. The rock, which is in the main far from fresh, is massive and carries obvious large phenocrysts of feldspar, and rather smaller phenocrysts of quartz in a yellow or brown fine-grained base. On the west side of the quarry there is a small exposure of basified, dark porphyry. The east side of the road leading to Craigdhu Farm should now be visited. In small quarries the tholeiitic upper member of the intrusion can be examined. It is a dark dolerite of medium grain. On close inspection occasional xenocrysts of quartz and feldspar can be seen. The margin is exposed in one small quarry where the basic rock is seen to dip steeply to the west through hardened gently-tilted sandstones.

In the field to the north and towards the main road there are exposures of porphyry and dolerite. The latter rock is seen here on the east side of the former. It is conjectured that the basic rock continues round the acid core on the north.

13. [NR 9995 2128] The west side of the ridge of Creag Dhubh should now be followed southwards and westwards towards the cairn on the west bank of the Struey Water. On the way the crags of dolerite above the farm should be noted. Their steep dip westwards is readily appreciated. On both banks of the Struey, dolerite is seen near the cairn. As usual it carries xenocrysts.

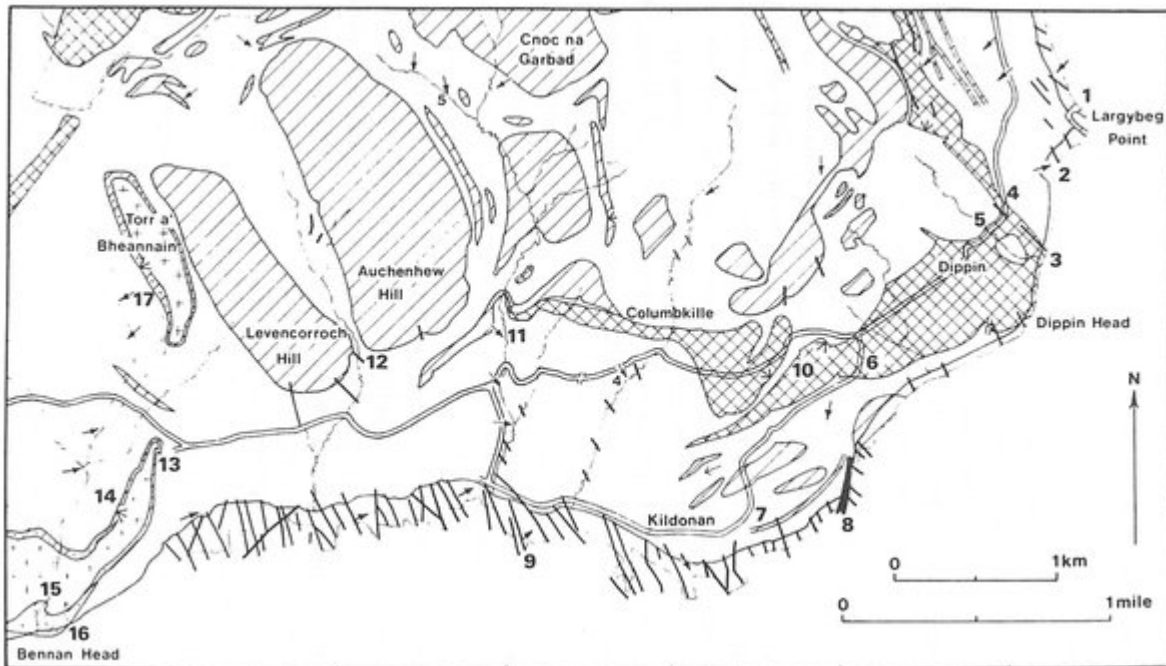
The section exposed in the Struey Water can be examined conveniently only if the water is low. In general the normal porphyry outcrops: there are, however, a few bands of darker, obviously more basic rock such as occur close to the upper and lower basic members of the intrusion.

14. [NR 9974 2096] Near a small waterfall at this locality dark, xenolithic porphyry outcrops. From this waterfall the burn flows in a gorge cut in the lower dolerite. At the seaward end occurs the Struey Falls. The shore may be reached by a path some 46m east of the Struey at the cliff top. Some scrambling is involved and extra care should be exercised.

15. [NR 9930 2047] A short distance east of the Struey Falls is Bennan Head and the Black Cave. At the latter large masses of sandstone, baked to quartzite, are isolated in the dolerite. Other patches of baked sediment are seen enclosed in whinstone near the foot of the Struey Falls. The lower dolerite, like the upper, is a dark rock of medium grain carrying xenocrysts of quartz and feldspar. In thin sections it is found to contain hypersthene.

16. [NR 9938 2022] A visit to Torr a'Bheannainn, lying north of the main road, will show that it is formed of quartz-feldspar-porphyry margined by quartz-dolerite with xenocrysts of quartz and feldspar. On the western side of the hill the dolerite dips at 50° to the southwest. Examination of this intrusion (Herriot 1972) has shown it to be related to the Creag Dhubh section of the Bennan composite intrusion.

References



(Figure 16) Geological sketch-map of the Largybeg–Kildonan area to illustrate Excursion 12. For key to map see Figure 5, p. 78. Note that the area occupied by Triassic sediments has been left blank.