
Chapter 20 Loch Uisg granophyre and gabbro

Introduction

Two large intrusions, granophyre and gabbro (or dolerite) respectively, are considered together here, partly because they are associated at their outcrops, and partly because it has not been found possible to decide which of them is the older. The Loch Uisg Granophyre, like many later intrusions of similar type, is lettered G on the one-inch Map, Sheet 44. Its exposures are interrupted by the waters of Loch Uisg and Loch Buie, but there is no difficulty in realizing the unity of the intrusion: to assist the reader in this respect, notes have been inserted on the one-inch Map to indicate the base, margin, and top of the mass, as exposed on the shores of Loch Buie. The granophyre, throughout, is of medium-texture and rather needly crystallization. The unity of the Loch Uisg Gabbro, lettered eD the same as several intrusions described in Chapter 11, is perhaps more open to question: two quite isolated outcrops are met with namely, at Loch Uisg and Loch Buie, in the north, and in Glen Libidil, in the south. The southern outcrop is distinguished in the field by its conspicuous augite-clusters, but the microscope shows that this difference is of minor account. On other grounds, a correlation between the two exposures seems justified since

1. The interval between the northern and southern exposure is only a mile.
2. Both localities show extensive, and sufficiently similar, basic masses at the base of the Loch Uisg Granophyre.
3. There are no exposures of the base of the Loch Uisg Granophyre where dolerite, or gabbro, does not occur in mass.

Further details of the two intrusions are given below under the headings Field-Relations, Age, and Petrology.

Field-relations

It has already been stated that the mutual age-relationships of the granophyre and gabbro have not been determined. Contacts have been examined in the cliff above Loch Buie, and also in a tributary of Glen Libidil descending Coill' a' Bhealaich Mhòir. There is no chilling of the one intrusion against the other, but rather, near Loch Buie, a suggestion of local admixture without the development of a xenolithic structure. Altogether, the appearances noted are too ambiguous to be interpreted with certainty. An indirect argument, however, suggests that the gabbro may be later than the granophyre, since no trace of gabbro is to be found attached to the roof of the granophyre.

Thus, we are left in doubt as to whether the sheet-form of the Loch Uisg Granophyre, illustrated in (Figure 34), is original, or, so far as its bottom is concerned, determined by the position of a later intrusion. It is scarcely necessary to add that we have no knowledge of the course along which either granophyre or gabbro has found its way into its present position.

While the original base of the Loch Uisg Granophyre remains dubious owing to the uncertain age-relations of gabbro and granophyre, the same cannot be said of the top of the intrusion. Throughout most of its outcrop, the granophyre has a flat top revealed in spectacular fashion by erosion. A comparison of the one-inch Map with views obtainable from the main road along Loch Uisg brings home this circumstance more clearly than any written description.

The flatness of the granophyre top, and its close approximation with the present surface, enable us to recognize with ease two very interesting additional features:

1. The granophyre has everywhere profoundly baked the adjoining basalt-lavas; the microscopic affects have already been dealt with in Chapter 10 (for alteration of overlying sediments, see Chapter 15) What interests us here is the scenic contrast of the crags of contact-altered lava above Loch Uisg as compared with the grassy slopes of unaffected lava rising from Loch Spelve.
2. The lavas, as can be realized by an inspection of scarp features, have a very pronounced system of folding to which the flat top of the granophyre pays no attention (Figure 34).

Near the west end of Loch Uisg, the top of the granophyre plunges steeply out of sight in a northerly direction, and in Cnoc a' Chreimain, on Loch Buie, it descends in like manner towards the south. Whether the marked lowering of the roof in these two localities indicates a dying out of the granophyre cannot be decided. In Glen Libidil, the roof and floor of the intrusion clearly come together as illustrated in (Figure 34)—but of course it must be remembered that the age-relationship of the granophyre to its gabbro-floor is undetermined.

Age

The general position of the Loch Uisg granophyre in Mull chronology may be gathered from the following facts:

1. The granophyre is intruded into the Plateau and Central Group of Mull lavas, and is clearly later than the arcuate folding which has affected these rocks (cf. (Figure 34) and Plate. 5, p. 165).
2. Near the eastern end of its outcrop, it cuts breccias referred to the superficial agglomerates described in Chapter 15. In its unbrecciated condition it contrasts very strongly with the Glas Bheinn Granophyre (Chapter 12), which is broken to pieces, probably by the explosions responsible for the superficial agglomerates just referred to. E.B.B., G.V.W.
3. It shows a variable behaviour to cone-sheets that may reasonably be referred to the Early Basic Cone-Sheets: thus (a), at the west end of Loch Uisg and in Eilean Mòr, Loch Buie, it is freely cut by basic cone-sheets; (b), in its western apophysis, near Cameron Farm, it is cut by an acid cone sheet which is itself clearly cut by basic cone-sheets; but (c), in the same apophysis, it seems to cut some basic cone-sheets.

It is probable from the above that, along with many of the Intermediate and Acid Cone-Sheets described in Chapter 19, the Loch Uisg Granophyre was intruded during some part of the period which gave rise to the Early Basic Cone-Sheets of Chapter 21. G.V.W.

Petrology

Loch Uisg Gabbro

Specimens of this gabbro, or dolerite, have been collected from Glen Libidil ([S17366](#)) [NM 6603 2310] and Loch Uisg ([S15067](#)) [NM 6435 2506], ([S17347](#)) [NM 6223 2442]. A striking field-characteristic of the Glen Libidil outcrop is the occurrence of augite in crystal-groups that individually measure about a quarter of an inch across. The central portion of these crystal-groups ([S17366](#)) [NM 6603 2310] contains a few well-formed, but relatively small, crystals of labradorite; while the marginal part is crowded with similar, but rather larger, feldspars. The material in which the augite-groups are disposed is formed of feldspar, similar to that of the larger individuals mentioned above, magnetite, pseudomorphs after olivine, and a mesostasis of alkali-feldspar, quartz, and epidote. The plagioclase outside the augite-groups is rather more zoned than that which occurs in intimate association with the augite, and has suffered a certain amount of albitization. Movement of the mesostasis with reference to the early formed augite- and feldspar-groups is indicated by a small vein of residual material cutting through the augite. It is worthy of comment that this type of rock is easy to recognize in the hand-specimen, and that it presents, in a magnified degree, the ophimottled structure characteristic of many of the Mull lavas (p. 138). Where more completely and uniformly crystallized ([S17347](#)) [NM 6223 2442], the rock has three main constituents, labradorite, olivine (as pseudomorphs), and augite. The feldspar is generally similar to that described above. The olivine is more abundant, and is sometimes earlier than, and sometimes later than, adjacent feldspar. The augite is considerably reduced in amount, and is definitely ophitic.

The gabbro, near its junction with the overlying Loch Uisg Granophyre, on the southern shore of Loch Uisg, shows three distinct types of crystallization within the -limits of a single slide ([S15067](#)) [NM 6435 2506]:

1. Labradorite is enclosed ophitically by an intergrowth of rhombic pyroxene and augite, the former now represented by pseudomorphs in fibrous hornblende. The ophitic structure is somewhat peculiar, in that the rhombic pyroxene, and to a less extent the augite, has moulded the outer zones of the feldspars, thus giving curious rounded contacts. The pyroxene, while showing a dominant tendency towards ophitic development, has, at the same time, an inclination towards

hypidiomorphism. A few small crystals of olivine (pseudomorphed) are of earlier formation than the pyroxenes.

2. Labradorite is enclosed in a subordinate acid mesostasis.

3. A more or less patchy separation of early-formed constituents from mesostasis has occurred along the junction of the two types described above. An unusually large crystal of augite, moulded upon a pseudomorph after rhombic pyroxene is in contact with one of these mesostatic patches, and shows marginal corrosion, together with a border-precipitation of magnetite in the adjoining magma.

Microscopic study confirms the characters observed in the field, and shows that the Loch Uisg Gabbro is an olivine-gabbro, or perhaps more properly an olivine-dolerite, which, towards its contact with the granophyre, presents heterogeneous characters. The abundance of rhombic pyroxene in the marginal zone recalls a notable character-of the hybrids described in Chapter 33. If, eventually, it can be shown that the mixed zone at Loch Uisg has resulted from assimilation of granophyre by gabbro, its interest will be heightened; but at present it is uncertain as to whether the gabbro was acidified by later granophyre, or *vice versa*.

There is, it may be added, a general difference between the Loch Uisg and Ben Buie Gabbros, sufficient to support the belief that the Loch Uisg Gabbro is not a mere offshoot from the larger intrusion.

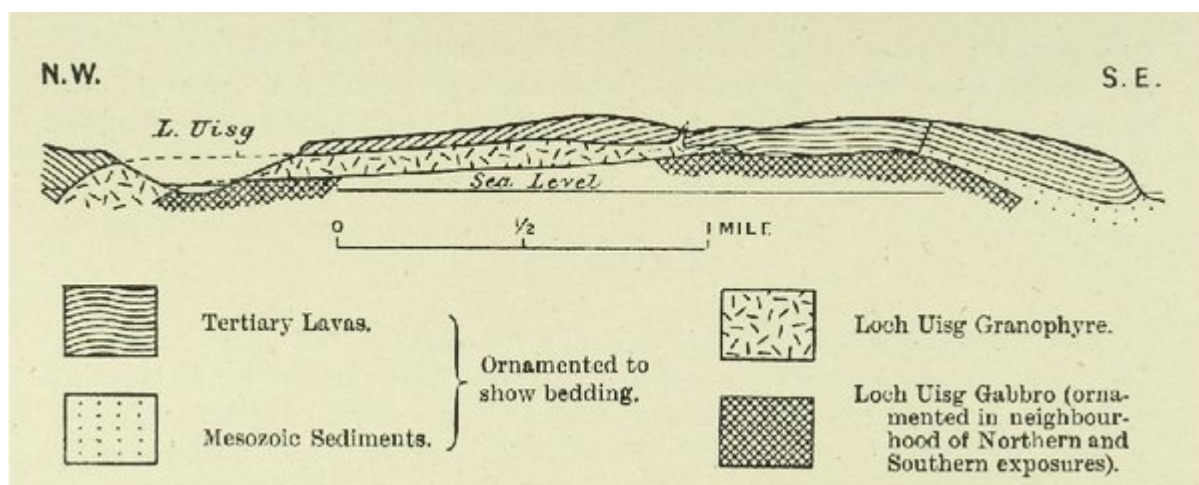
Loch Uisg Granophyre

A specimen, taken as representative of this intrusion, shows a microgranophyre having pronounced affinities with the craignurites, but in a poor state of preservation (S18873) [NM 6515 2512]. There is a moderate development of acicular augite, now represented by chlorite, and plagioclase zoned with orthoclase; the plagioclase of the elongated crystals is now albite. The ground-mass is micrographic with only a small proportion of readily distinguishable quartz. Although unrepresented in the Survey collection, patches with coarse graphic structure are a feature near Laggan, on Loch Buie.

Another specimen (S18875) [NM 6515 2512], taken from the top of the mass, is of a similar variety, but bears evidence of more rapid cooling. A marked difference exists between the early acicular type of crystallization and that of the base. There is a strong development of felspar-needles (albite-oligoclase), and there are also a few long and sometimes very discontinuous pseudomorphs after augite. The ground-mass is felsitic rather than granophyric in nature, and is characterized by many curved skeletal growths which doubtless were originally formed of augite and magnetite.

This granophyre has produced striking metamorphic effects in its roof, as described already in Chapters 10 and 15.

H.R.T., E.B.B.



(Figure 34) Section showing Loch Uisg Granophyre cutting folded lavas.