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### 3. 'Hornblende porphyrite' (microdiorite, spessartite)

#### Introduction

Hornblende-bearing microdiorites are very abundant in Assynt and were first described by Bonney (1883). The majority form sills, although in places they cut across the bedding of the sedimentary rocks, and true dykes occur only in the Lewisian gneiss. The sills are usually of the order of 1 m thick, although one intrusion into Pipe Rock on the ridge of Breabag is over 30 m thick. They have a fine-grained feldspathic groundmass containing feldspar phenocrysts up to 6 mm in size and 3 mm hornblende phenocrysts. Phenocrysts of biotite are visible in places. In section the hornblende is commonly strongly colour-zoned. The feldspar phenocrysts are usually plagioclase, but alkali feldspar also occurs. The groundmass is usually made up of small prisms of euhedral or subhedral K-feldspar and sodic plagioclase enclosed in quartz. As in many lamprophyric rocks many of the constituent minerals are commonly very altered. While the Assynt microdiorites and lamprophyres are not strictly alkaline rocks, they undoubtedly overlapped the alkaline magmatism in both space and time and their role in the petrogenesis of the syenitic rocks must be considered.

Members of this suite are common in the Sole, Glencoul and Ben More thrust sheets but they do not occur in the Foreland or in the Moine Nappe. This is yet another example of how the igneous rocks show that the thrust sheets have distinct characters. Sabine (1953, fig. 5) provided a map of the distribution of 'hornblende porphyrites' throughout Assynt. The relationships suggest that the 'hornblende porphyrites' were emplaced early in the igneous history of Assynt prior to all the thrust movements and perhaps contemporaneously with the Canisp Porphyry in the Foreland (Halliday *et al.*, 1987, table 1). Of course, the upper-crustal shortening implied by the thrust movements means that the 'hornblende porphyrites', at the time of their emplacement were many kilometres to what is now the east of the Canisp Porphyry, and must have been emplaced over a wider area than now exposed because of later shortening on the Ben More thrust plane. The 'grorudites', discussed above, which are restricted to the Ben More Nappe, must have been emplaced prior to the main movements on the Ben More Thrust, in an area to the east which only overlapped partially that into which the 'hornblende porphyrites' were injected.

Because of their widespread distribution in Assynt, Read (1931) studied the cataclastic deformation of the 'hornblende porphyrites', following an early suggestion by Geikie (1888) that they show a progressive deformation eastward, mirroring the increase in metamorphism of the rocks generally in going from the Foreland to the Moine. Sabine (1953) revisited this problem and showed that cataclastic deformation of the 'hornblende porphyrites' is variable within the thrust belt and is most closely associated with proximity to one or other of the major thrusts.

There are many localities for viewing 'hornblende porphyrites' in the thrust belt. The GCR sites were chosen as representing intense swarms, one in an area of great structural complexity close to Inchnadamph, the other in an area with a considerable variety of hypabyssal rocks for which a map was provided by Sabine (1953).

#### [References](#)