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# Allt Doir' Chatha

[NC 500 023]

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## Introduction

The Allt Doir' a' Chatha GCR site provides a stream section through a 200 m-thick sequence of interbanded amphibolitic and quartzofeldspathic gneisses, flanked by Moine psammites of the Morar Group (Figure 6.40). The gneisses form part of a strip that extends from Loch Shin through this locality to Glen Cassley (Figure 6.38)a. Although exposure is limited, the site is of historical interest in Highland geology, particularly when related to the better-exposed and more lithologically diverse The Airde of Shin GCR site. Because of the finely layered nature of the gneisses, their association with calcareous rocks of clear sedimentary origin at The Airde of Shin and structural concordance with the enclosing Moine psammites, H.H. Read (in Read *et al.*, 1926) interpreted them as part of the Moine sedimentary sequence. He suggested a volcanic origin for the amphibolitic rocks, coining the term 'Durcha-type Moines'. Consequently, he disputed a basement origin for all the stripes of layered amphibolite that occur within the Moines of Sutherland and Ross-shire, arguing that 'You cannot have a Lewisian inlier one hornblende crystal thick!'.

This view had considerable influence on postwar research in the Highlands, and several previously identified Lewisianoid inliers were re-interpreted as Moine (e.g. Sutton and Watson, 1953). However, subsequent structural studies re-affirmed the presence of basement 'slices' at a high level in the Moine sequence, and geochemical investigation of the Durcha mafic and felsic gneisses by Winchester and Lambert (1970) suggested that they were more probably of Lewisian affinity.

## Description

The Lewisianoid rocks are exposed sporadically in the Allt Doir' a' Chatha from [NC 5015 0224] upstream to the deer fence at [NC 4980 0248], an outcrop length of about 300 m (Figure 6.40), (Figure 6.41). They consist of an interlayered sequence of striped amphibolite, epidote-amphibolite, biotite-rich felsic gneiss and quartzofeldspathic gneiss, all dipping moderately to the south-east. The gneisses are concordant with the psammitic Moine rocks of the Altnaharra Psammitic Formation above and below. Petrographical descriptions of the main rock-types can be found in Read *et al.* (1926, pp. 144–5).

The upstream contact with the Moine psammites is located about 45 m below the deer fence, marked by a layer of platy quartz-muscovite schist, interpreted by Peacock (1975) as tectonic in origin (see The Airde of Shin GCR site report, this chapter). The psammites are very platy, with no younging evidence preserved.

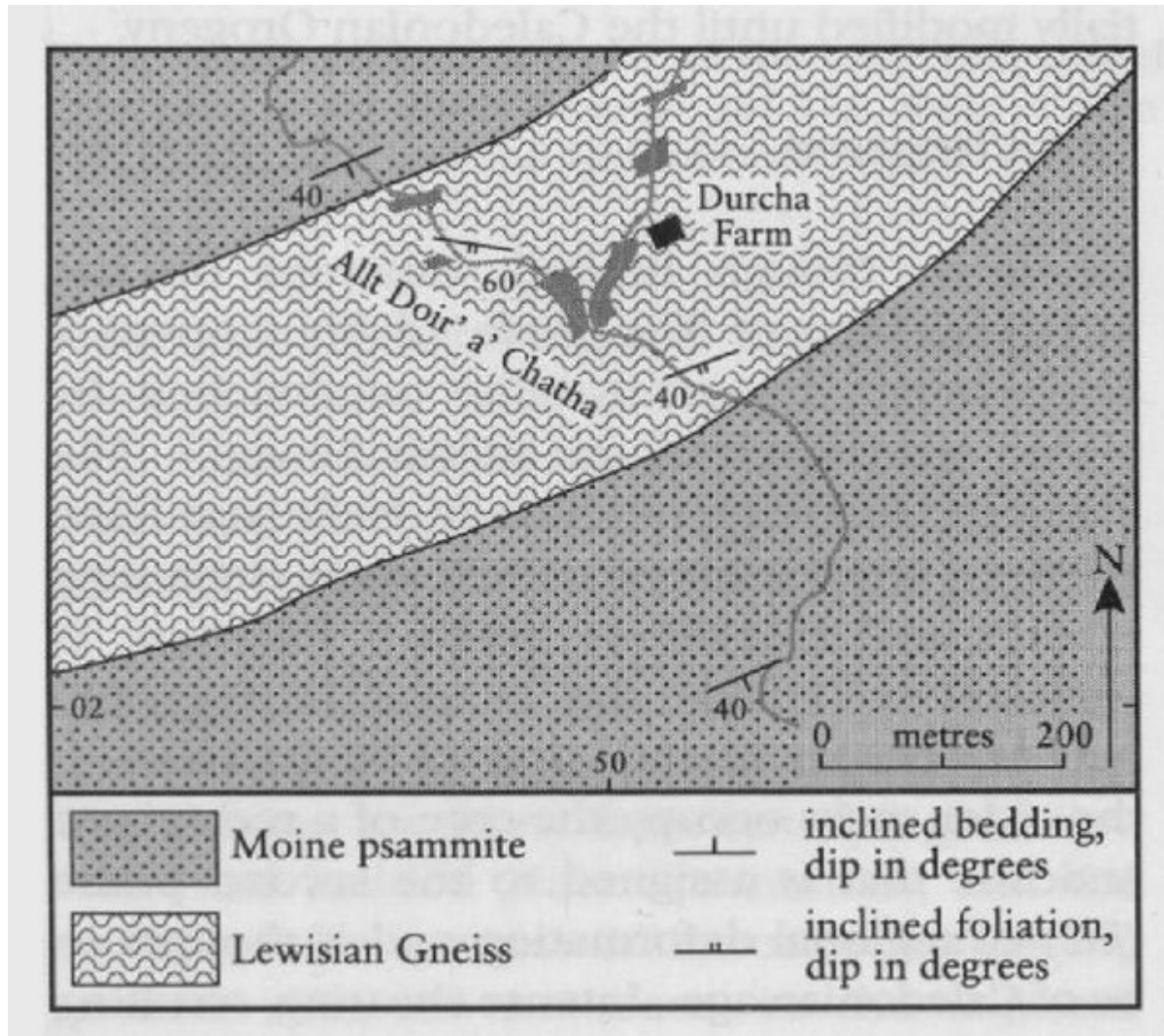
## Interpretation

Field and geochemical evidence (Winchester and Lambert, 1970) have shown that the strip of dominantly amphibolitic rocks to which the 'Durcha Moines' belong have Lewisianoid affinities. Poor exposure precludes a structural interpretation of basement-cover relationships at the Durcha site. By analogy with The Airde of Shin GCR site, the basement rocks may lie in the core of the same recumbent anticline, but owing to the swing in strike between the two localities (Figure 6.38)a caused by the Asssynt 'bulge', the inverted limb would now lie to the north. Extreme attenuation of the Lewisianoid gneisses during Caledonian deformation induced the fine striping, which misled H.H. Read into advocating an original sedimentary and volcanic origin for these rocks.

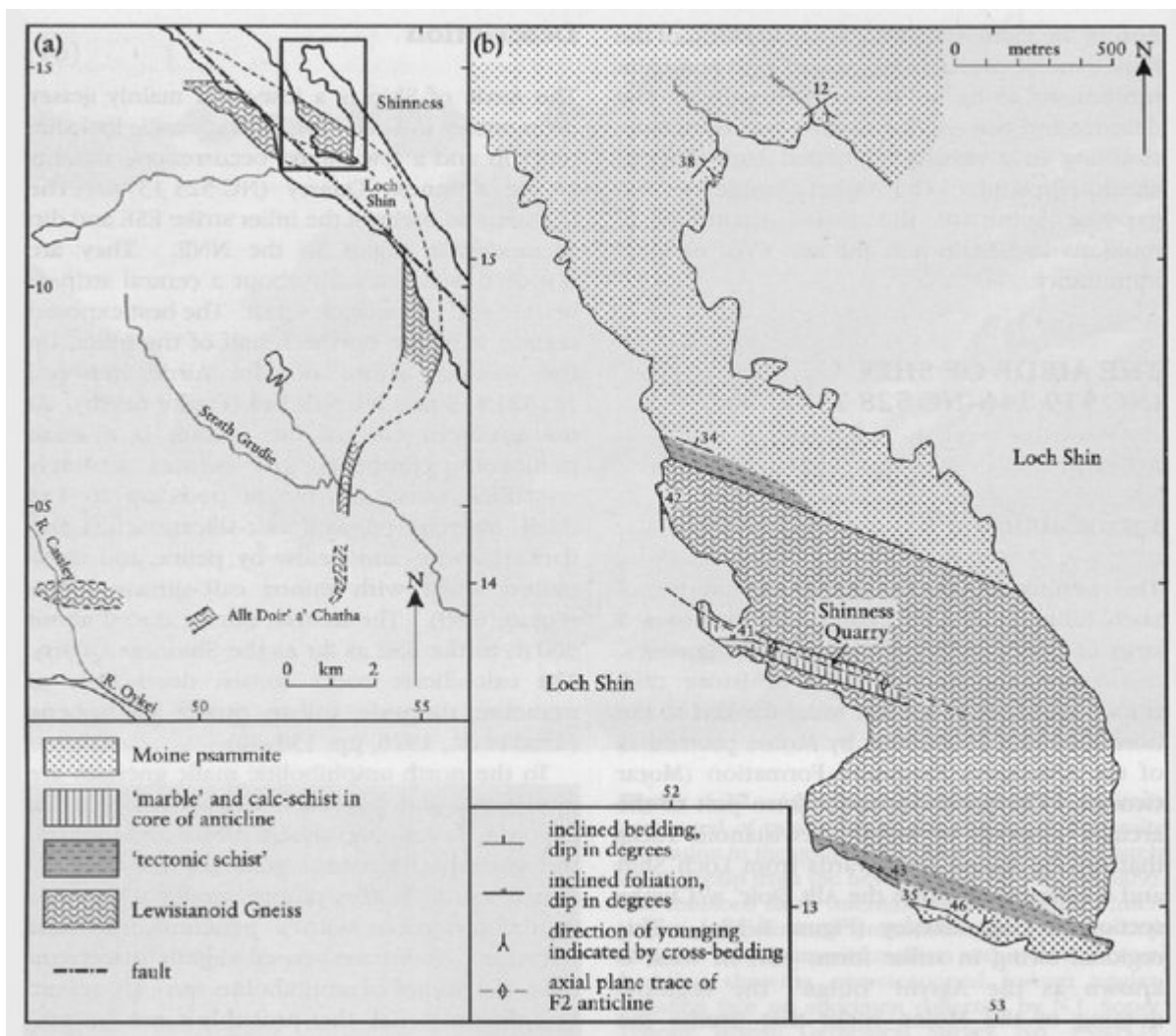
## Conclusions

The Allt Doir 'a' Chatha exposes a strip of highly attenuated amphibolitic and quartzofeldspathic gneisses that are interpreted as part of a Lewisianoid basement inlier within Moine psammities of the Altnaharra Psammite Formation (Morar Group). As the type locality of Read's 'Durcha-type Moines', the site is important in the history of geological research in the Highlands. It stands as an example of how the 'authority view' had great influence but in time was ultimately abandoned. Some 3 km along strike to the west, at [NC 47 03], a more-complete section in the River Cassley shows similarly attenuated, striped mafic and felsic Lewisianoid gneisses.

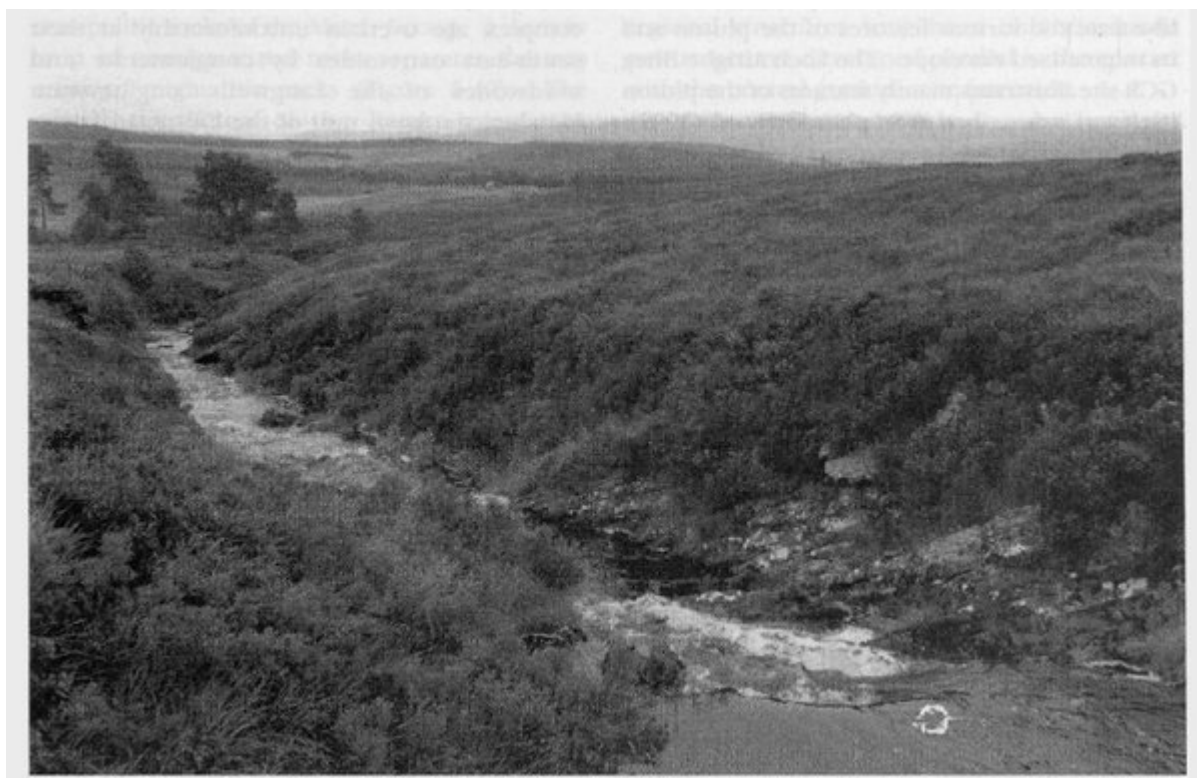
## References



(Figure 6.40) Sketch map of the Allt Doir 'a' Chatha Lewisianoid Inlier; amphibolitic mafic gneiss outcrops shown in darker grey.



(Figure 6.38) (a) Location map of the Loch Shin area showing the strip of Lewisianoid rocks that extends from Loch Shin to the River Cassley. (b) The Airde of Shin Lewisianoid Inlier. Based on Winchester and Lambert (1970) and Strachan and Holdsworth (1988).



(Figure 6.41) View downstream from the upper Moine contact in the Allt Doir' a' Chatha. (Photo: N.J. Soper.)