

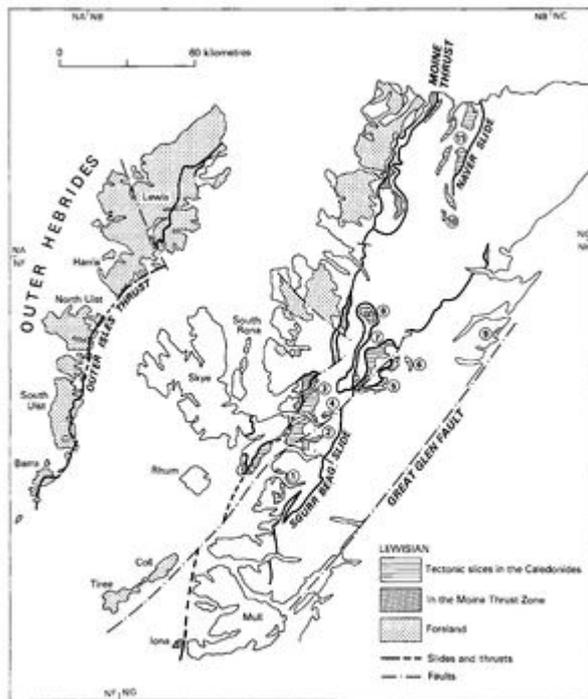
Lewisian inliers east of the Moine Thrust, Northern Highlands of Scotland

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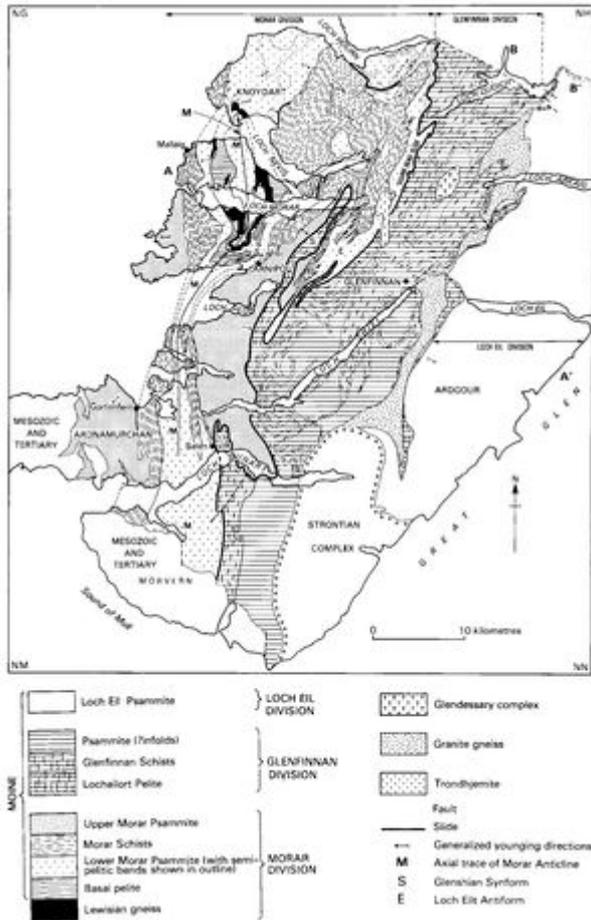
Johnstone, G S and Mykura, W. 1989. British regional geology: Northern Highlands of Scotland. Fourth edition. Keyworth, Nottingham: British Geological Survey.

Lewisian inliers east of the Moine Thrust

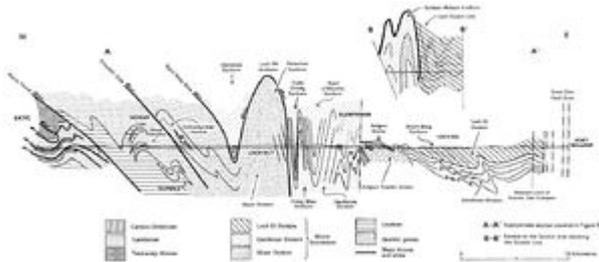


The inliers east of the Moine Thrust; 1 Morar 2 Glenelg 3 Attadale 4 Coire nan Gall 5 Strathfarrar-Monar 6 Orrin 7 Scardroy 8 Fannich 9 Rosemarkie 10 Shin 11 Sutherland Group

Major structural divisions of the Lewisian rocks of the Northern Highlands. P915460.



Geological sketch map of the Morar, Glenfinnan and Loch Eil areas. P915473.



Semi-diagrammatic section across the southern part of the Northern Highlands, Skye to Loch Eil. P915474.

The original surveyors of the Geological Survey recognised Lewisian rocks within the Caledonian orogenic belt (P915460). Most of these, according to the fashion of the times, were believed to represent complex upfolds (inliers) of autochthonous basement. Later structural reinterpretation of some of these Lewisian-like outcrops gave rise to speculation that they could be integral parts of the Moine Succession (Sutton and Watson, 1953). However, it is now generally accepted that they are Lewisian rocks lying within the Moines, either as attenuated isoclinal cores or as thrust slices (or both). The folding and thrusting which resulted in the emplacement of the Lewisian sheets may be of late Precambrian age, but all the inliers are to a greater or lesser extent affected by Caledonian folding and metamorphism (see P915460). Their structure has been studied by, amongst others, Sutton and Watson (1953; 1955), Ramsay (1958) and Tobisch and others (1970).

In the west, near the Moine Thrust, the inliers may be parautochthonous, in the sense that they are either folds or thrust sheets in contact with Lewisian basement which directly underlies basal Moine strata. This basement, however, may have been transported for a considerable distance on the

Moine Thrust. Within the central part of the Northern Highland Moines, and well within the orogenic belt, a group of inliers rest directly on the major structural break formed by the Sgurr Beag Slide; they appear to be essentially allochthonous. Between the Moine Thrust Belt and the Sgurr Beag Slide lie numerous Lewisian inliers. In the south these are found as small thrust slivers ranging downward to a few tens of metres in length, but in the north they form larger areas of thrust and folded Lewisian rocks which may be several kilometres long. The distinction between allochthonous and parautochthonous is possibly only of significance insofar as it indicates remoteness from the basement and the degree of strain necessary to emplace a Lewisian sheet at a given level (see Rathbone and Harris, 1979).

In the parautochthonous inliers near the Moine Thrust the Lewisian is represented by two facies, a 'Western Lewisian' with a character similar to that of the adjacent Foreland Lewisian, and an 'Eastern Lewisian', which differs in having a higher proportion of metabasic rocks and sedimentary gneisses, including types not represented (or scarce) in the metasediments of the Foreland, such as graphite schist, calc-silicate rock and marble. This eastern facies is dominant in the allochthonous slices within the Moine, suggesting that the Lewisian basement further east is significantly different from that found in the Foreland. Moreover, Watson and Dunning (1979) cite evidence of the chemistry of crust-derived Caledonian plutons to suggest that the basement underlying the Caledonides also contained a higher proportion of granites.

The largest of the parautochthonous inliers is that of Glenelg-Attadale (Ramsay, 1958b; Barber and May, 1976). This inlier contains both 'Western' and 'Eastern' Lewisian rocks separated, in Attadale, by a narrow zone of tectonic schist containing both Lewisian and Moine components, and in Glenelg by a narrow zone of mixed, probably interfolded, rocks. The rocks of the Western Lewisian have Scourian affinities and show little, if any, Laxfordian effects — or at least none clearly separable from the later Caledonian overprint, which becomes more marked eastwards. Both Eastern and Western gneisses have a pre-Caledonian deformation history and the movements along the Moine Thrust appear to be the fourth (D_4) of the six phases of deformation recognised in the inlier. The inlier is the only one where a basal conglomerate indicates a non-tectonic transition from the Lewisian to the overlying Moine. The conglomerate is considerably deformed.

The Morar Inlier ([P915460](#)) ([P915473](#)) and ([P915474](#)) comprises hornblende gneiss and amphibolite (Plate 6). It has been interpreted as Lewisian interleaved with basal Moine strata by folding and thrusting (Richey and Kennedy, 1939; Kennedy, 1955; Ramsay and Spring, 1962). This interleaved sequence was folded in Caledonian times into a large antiformal structure, the Morar Anticline.

East of those two parautochthonous inliers lie several minor slices — some only metres to centimetres thick — which lie on thrusts; their platy fabric can be traced into the Moine rocks for long distances beyond the limit of Lewisian outcrop. Larger areas of mixed Moine and Lewisian rocks, in part infolded and in part thrust, are found in Coire nan Gall (Clifford, 1958) and the Saddle area (Simony, 1973). Hornblendic or biotitic schists are the common rock types of these enclaves, contrasting with the gneisses of the adjacent Moines. Along the Sgurr Beag Slide, Lewisian rocks are found in the south as tiny slices of basic gneisses (e.g. near Loch Hourn) and as larger, but still minor, masses of hornblende gneiss, amphibolite and marble in Glen Shiel. It has been inferred (Tanner and others, 1972) that the major inliers of Central Ross-shire further north also lie immediately above the Sgurr Beag Slide (or possibly slide complex). These major inliers (of Strathfarrar-Monar, Glen Orrin, Scardroy, etc.) are of 'Eastern' type, comprising feldspathic gneisses and various hornblende gneisses, with hornblende schists, ultrabasic rocks, marbles, calc-silicate rocks and some graphitic schists. The Fannich Inlier is now interpreted (Tanner and others, 1972) as lying on the Sgurr Beag Slide below a klippe of Glenfinnan Division schists; this suggestion has received recent support from the trace element studies of the pelitic rocks (Winchester and others, 1981).

Between central Ross and the north coast several major and minor slices of Lewisian rock lie to the west of the inferred continuation of the Sgurr Beag Slide. Amongst these, the minor outcrops were taken in places to be Moine rocks of unusual aspect but are now recognised as thrust lenticles (e.g. Peacock, 1975). Major Lewisian masses with abundant basic gneisses are found in folded and thrust slices in Sutherland. Some of these have previously been interpreted as Moine basics of pre- to early-Caledonian age. More recent work by Moorhouse and Moorhouse (1979) has distinguished geochemically between the basics of Moine and Lewisian age. The major Lewisian enclaves of Sutherland are those of Loch Naver, Borgie, Tongue, Bettyhill and Mudale; they are known as the Sutherland Group, with the Strathy Complex on the north coast. The Strathy Complex consists of a grey quartzose gneiss with subordinate amphibole-bearing gneiss, amphibolite and marble. It is of unusual aspect, both for Lewisian and Moine rocks. Moorhouse and Moorhouse (1983) discuss the possibility that it is a much modified part of the Laxfordian Lewisian basement, including originally dacitic supracrustal igneous rock.

Adjacent to the Great Glen Fault at Cromarty and Rosemarkie, two inliers of Moine rocks protrude through the Old Red Sandstone sediments of Easter Ross. In the southerly inlier, that of Rosemarkie, the Moine rocks are intimately associated with hornblende gneisses which Rathbone and Harris (1980) consider to be part of the underlying Lewisian basement.

[Selected bibliography](#)

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