15 Creag nan Caisean–Meall Reamhar

[NN 771 6017]–[NN 783 622]

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15.1 Introduction

The two peaks of Meall Reamhar (493 m O.D.; [NN 784 618]) and Creag nan Caisean (477 m O.D.; [NN 778 607]) form part of a NNE-trending gentle rocky ridge surrounded by plantations, north of Tummel Bridge (Figure 3.37). Exposures within the GCR site provide evidence for the downward-facing Meall Reamhar Synform, formerly interpreted as the primary F1 closure of the Atholl Nappe, structurally beneath the Tay Nappe (Thomas, 1979, 1980), but now regarded as one of the major F2 folds that affect the inverted lower limb of the F1 Tay Nappe (Treagus, 2000).

The site also has stratigraphical significance and contains outcrops of two major formations of the Grampian Group, the Bruar Formation and the Tummel Quartzite Formation. On the particularly well-exposed south-east flank of Creag nan Caisean, consistent younging evidence has played a vital role in establishing the stratigraphy on the upper limb of the major fold. This is the type area for the Tummel Quartzite Formation, which here contains a number of distinctive quartzite units separated by laminated schistose psammites. .

15.2 Description

The southern boundary of the GCR site coincides with a forestry road, which is accessible either from Easter Bohespic [NN 756 603] in the west or Grenich [NN 804 603] in the east.

The Bruar Formation is exposed on the forestry road to the west of the surge shaft of the Dalcroy Power station (notably at [NN 767 603]), and on Meall Reamhar. Laminated schistose psammites with way-up evidence are dominant, but there are fewer quartzites and more schistose pelites and semipelites than in the overlying formation. On the summit of Meall Reamhar [NN 784 618] the formation contains more interbedded layers of schistose pelite and is intruded by late-Caledonian NE-trending dykes in the hinge-zone of the Meall Reamhar Synform.

Some 200 m to the east of the surge shaft, the lowest of the quartzite units at the base of the Tummel Quartzite Formation is well exposed. This is the first of numerous individual 5–30 m-thick beds of feldspathic quartzite, which are characteristic of the Tummel Quartzite in this area and extend north-eastwards for 9 km towards Glen Garry. In general they dip steeply to the south-east. Interbedded with the quartzites are schistose psammites, which display laminations with abundant examples of ripple drift, dunes, convolutions and, more rarely, sedimentary dykes, all younging consistently to the south-east, towards the upper boundary with the Tummel Psammite Formation.

Small-scale minor folds are common, especially within the quartzites. The polyphase nature of the deformation means that styles and plunges vary greatly throughout the formation. Two penetrative schistosites are related to two sets of early minor folds, which are commonly difficult to distinguish one from the other. However the dominant vergence of the later of the two sets is to the south-east, and they are associated with an axial planar cleavage dipping steeper than the bedding. Two further sets of crenulation cleavages cross-cut the early sets.

Immediately to the north-west of the summit of Meall Reamhar, the dip of the bedding and the subparallel schistosity become less steep (25–40°) and the second, dominant, penetrative schistosity is steeper (40–60°), indicating that the axial trace of the major Meall Reamhar Synform has been crossed. This is confirmed by the occurrence of inverted cross-bedding in the laminated schistose psammites on the southern slopes of Glen Errochty, to the north of the GCR

site. The axial trace of the synform trends north-east below the summit ridge, where there is an antiformal plunge culmination; from here the hinge plunges at low angles to the south-west and north-east.

15.3 Interpretation

The excellent exposures in this GCR site provide critical evidence for the key, upward-younging, stratigraphical succession of the Grampian Group from the Bruar Formation through the Tummel Quartzite into the Tummel Psammite above.

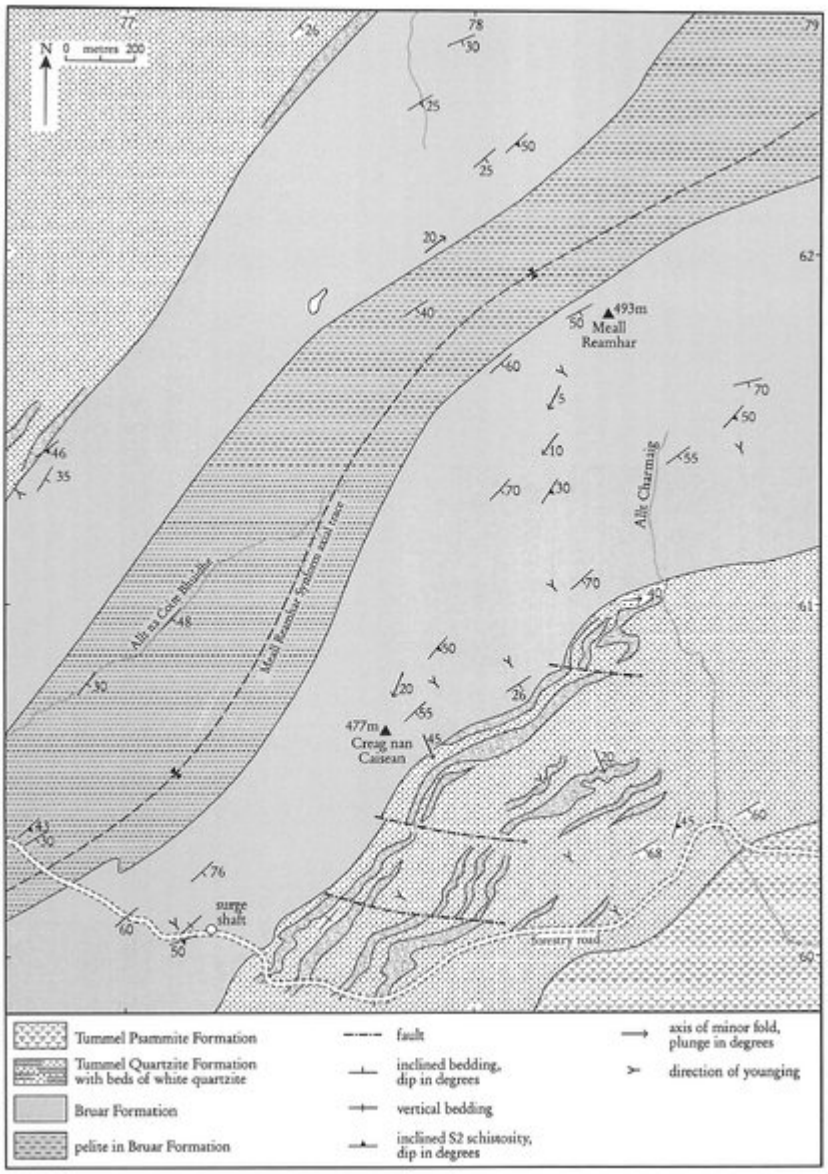
The main structural debate concerns the age of the major Meall Reamhar Synform. The presence of small-scale interference structures involving both of the primary deformation phases (D1and D2), as well as the two later cross-fold phases, indicates the structural complexity of the area, but it is considered that the primary deformation has dominated the large-scale structure. The major closure was initially interpreted by Thomas (1965, 1980) as an F1 closure. Two hundred and fifty metres to the west of the surge shaft at [NN 771 601], near the forestry road, there is evidence suggesting that some folding may be earlier than that associated with the Meall Reamhar Synform. Here, very steeply dipping schistose psammites with cross-bedded laminae are cut at right angles by a single (or composite) penetrative schistosity, with no sign of any bedding-parallel schistosity. (Figure 3.38) This was interpreted by Thomas as being representative of the downward-facing (F1) closure of the major Meall Reamhar Synform. However, it is now thought that this might be an early minor F1 fold hinge facing south-east, which is not related to the Meall Reamhar closure and certainly does not affect the general upward younging on the steep limb of that fold.

The Meall Reamhar Synform has been recently re-interpreted to be of D2 age, complementary to the Balliemore Antiform and other NW-verging major folds within the Appin and Argyll groups to the south (Treagus, 2000). The evidence for this, as well as that in this GCR site, comes from the consistent south-east vergence of F2 minor folds in Grampian Group formations to the south-east (e.g. in the Kynachan Quartzite Formation on Creag Kynachan at NN760 576) and the north-west vergence of the F2 folds to the north-west (as is also described at Clunes–locality 6 of the *A9 and River Garry* GCR site report). These folds are associated with a penetrative S2 schistosity in semipelites, on which the folds face down to the south-east.

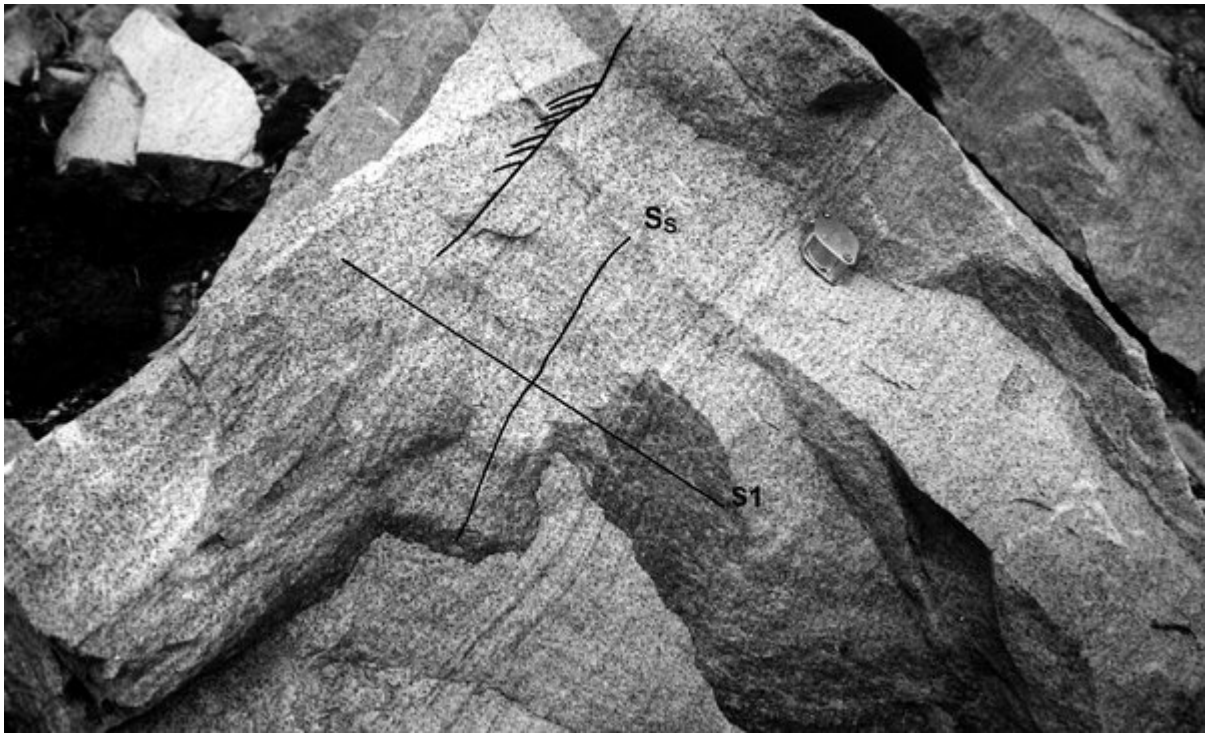
15.4 Conclusions

The Creag nan Caisean–Meall Reamhar GCR site provides important evidence that helps to establish a succession in the Grampian Group, through its excellent younging evidence and distinctive quartzite lithologies. The Bruar Formation and Tummel Quartzite Formation are both well represented. Creag nan Caisean is one of the best areas in the Central Grampian Highlands to see interference structures in minor fold outcrops, which reflect the regional polyphase fold pattern. The site also provides dramatic evidence, from minor tectonic structures, for the presence of the two limbs of the F2 Meall Reamhar Synform, a downward- and SE-facing anticline that is an important component of the major folds that affect the lower, inverted, limb of the Tay Nappe. This fold is complementary to the Balliemore Antiform described in the *Strath Fionan* GCR site report.

References



(Figure 3.37) Map of the Creag nan Caisean–Meall Reamhar GCR site after Thomas (1965). Minor intrusions are not shown.



(Figure 3.38) Exposure near the forestry road on the south flank of Creag nan Caisean at [NN 771 601], where a strong penetrative schistosity (S1) cuts steeply dipping, cross-laminated (SS) schistose psammite. The hand lens is c. 3 cm in diameter. (Photo: P.R. Thomas.)