
21 Bun-an-uilt, Islay

[NR 295 692]–[NR 297 694]

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21.1 Introduction

The rocks of Islay may be separated into four major divisions, namely the Rhinns Complex, Colonsay Group, Bowmore Sandstone Group, and Dalradian Supergroup. The boundaries between these units are tectonic and poorly exposed, and partly because of this, correlation of the Rhinns Complex, the Colonsay Group and the Bowmore Sandstone Group with rocks elsewhere in Scotland has proved equivocal. Of interest here is the Bowmore Sandstone Group and its relationship to the Dalradian rocks. The boundary between these two units is a tectonic break known as the Loch Skerrols Thrust. This structure was first recognized and described by Wilkinson (1907) who noted the existence of mylonitic rocks at the junction between the two units. Bailey (1917) alluded to the presence of a tectonic break on stratigraphical grounds, because the Bowmore Sandstone rocks appear to lie within the western limb of the Islay Anticline and are not repeated on the eastern limb.

For much of its length, the thrust is not exposed and its presence is inferred from a change in lithology and by the local strain increase apparent in nearby exposures. The only locality where the thrust is actually exposed is at Bun-an-uilt on the east side of Loch Gruinart. Here the thrust is manifested by a shear-zone with intensely foliated rocks (mylonites) that separates the Jura Quartzite of the Dalradian Argyll Group to the south from the Bowmore Sandstone to the north.

The interpretation and significance of the Loch Skerrols Thrust is by no means resolved and, consequently, nor is the stratigraphical status of the Bowmore Sandstone. The latter, which shows no significant signs of metamorphism, has been variously correlated with the Torridonian (Wilkinson, 1907; Green, 1924; Peach and Horne, 1930; Stewart, 1969), the Moine (Roberts, 1974), or the Dalradian Crinan Grit Formation (Fitches and Maltman, 1984).

21.2 Description

Whereas the stratigraphy and structure of the Dalradian rocks of Islay are reasonably well understood, the same cannot be said for the Bowmore Sandstone Group. It is generally poorly exposed, but is assumed to be bounded by the Loch Skerrols Thrust to the east and the Loch Gruinart Fault to the west. It has been described by Stewart (1969) and Fitches and Maltman (1984) as consisting of monotonous grey-brown feldspathic sandstones, with indistinct bedding and poorly developed tectonic fabrics. The group was divided into two by Amos (1960): the Laggan Sandstone Formation overlain by the Blackrock Grit Formation. The Laggan Sandstone Formation consists of fine- to medium-grained sandstones with thin siltstones and mudstones, and the Blackrock Grit Formation consists mainly of coarse-grained sandstones with pebbly bands.

The area around Loch Gruinart is low lying and exposure inland is very poor. Exposure of the thrust is limited to a thin strip along the eastern shoreline of the loch ([NR 2950 6930], (Figure 2.47)), where it separates the Jura Quartzite Formation from the Blackrock Grit Formation. There are two outcrops of the Jura Quartzite along the shoreline. This is due to the shallow dip of the thrust (see below) and later faulting. South of the thrust at [NR 2947 6919], the Jura Quartzite rocks are white, medium-grained quartzites, which have a somewhat shattered appearance. Bedding is difficult to identify and the planar surfaces in the rock are most likely to be tectonic foliation surfaces, as they contain a stretching lineation. The Loch Skerrols Thrust is not a simple planar boundary but a zone of intensely deformed and recrystallized rocks (Figure 2.48), which Fitches and Maltman (1984) referred to as the Loch Skerrols Shear-zone. The intensity of the foliation increases in the Jura Quartzite as the thrust (shear-zone) is approached, as indicated by its closer spacing. The

foliation surfaces generally have shallow dips and a well-developed stretching lineation, which generally plunges towards 110° but with a variable amount of plunge due to later folding. The later folds are upright open structures that have hinges trending approximately east–west. However, these are only minor folds with wavelengths of a few tens of centimetres.

Immediately north of the shear-zone are greenish weathering impure feldspathic sandstones, which belong to the Blackrock Grit Formation. They also have a fabric, but this fabric becomes less intense northwards away from the shear-zone. The foliation surfaces are more micaceous than those in the Jura Quartzite and the rocks have an upright crenulation cleavage striking about 200°. Unlike the quartzites they do not show an obvious stretching lineation. The exposure ends a few tens of metres north of the shear-zone. About a hundred metres farther north, just west of Bun-an-uillt house, there is prominent headland that consists of shattered white quartzite. This appears to be Dalradian and was interpreted by Fitches and Maltman (1984) as lying adjacent to a later fault, not the Loch Skerrols Thrust. The Loch Skerrols Thrust is cut by several later faults such as this one, and these faults, along with later folding, probably explain the outcrop pattern of the thrust at the GCR site.

21.3 Interpretation

As emphasised by Fitches and Maltman (1984), the interpretation of the Loch Skerrols Thrust is vital to any consideration of the stratigraphical affinity of the Bowmore Sandstone. Early workers (see introduction) had considered that the Bowmore Sandstone could be correlated with either the Torridonian or the Moine rocks of the Northern Highlands, which presumably would imply that the Loch Skerrols Thrust is a structure analogous to the Moine Thrust. Fitches and Maltman concluded, however, that the thrust is a re-activated normal fault that developed into a shear-zone during the same deformation event that produced the Islay Anticline. Because the strain associated with the thrust diminishes considerably towards Tallant [NR 330 590], some 11 km south-south-east of this GCR site, and Laggan Bay, they also concluded that there might be stratigraphical continuity between Dalradian rocks on the north-western limb of the Islay Anticline, and the Bowmore Sandstone. The Bowmore Sandstone was thought to be 'laterally equivalent to the Crinan Grits', being the shallow-water correlative of the deeper water grits.

A provenance study of clasts in the Bowmore Sandstone has revealed various gneisses and pegmatites of Lewisian type (Saha, 1985). In particular, distinctive blue quartz that is characteristic of Scourian granulite-facies gneisses is present, as it is in the Colonsay Group and the Dalradian rocks of north-east Islay. The Blackrock Grit Formation also contains pebbles of chert, jasper and ferruginous sandstone indicative of non-metamorphic or low-grade sedimentary rocks (e.g. Torridonian) in the source area.

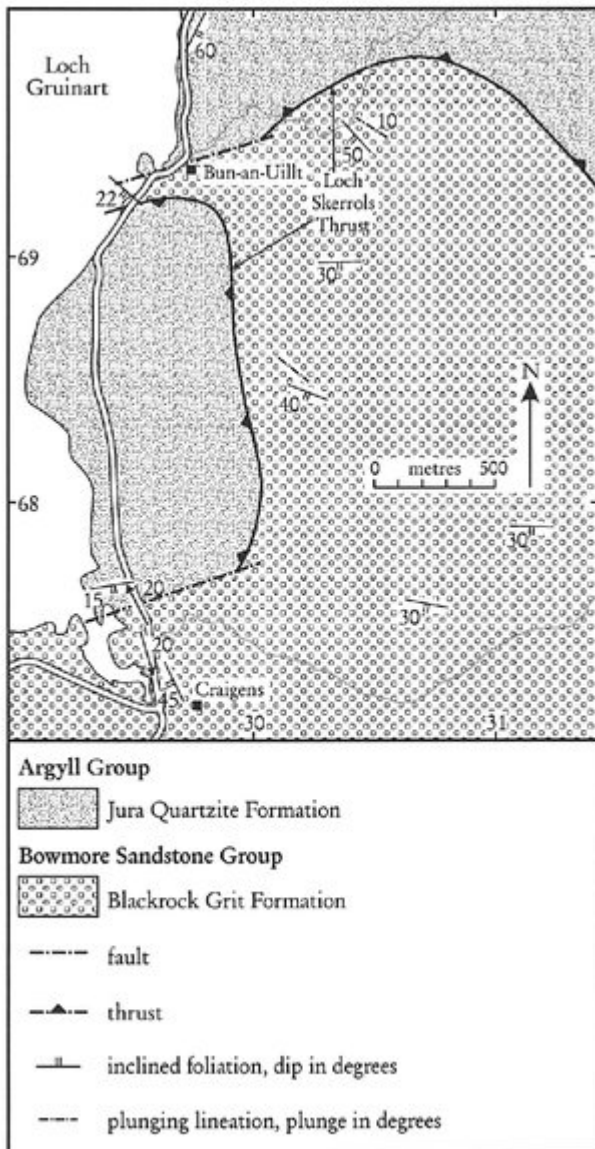
Saha (1989) also studied the variation in strain associated with the Loch Skerrols Thrust, and concluded that the thrust is a break-thrust that developed on the overturned north-western limb of the Islay Anticline. He drew no conclusions as to the stratigraphical affinity of the Bowmore Sandstone. However, it is implicit in his structural model that it must be Dalradian and it would be reasonable to reach the same conclusion as Fitches and Maltman (1984), namely that it correlates with the Crinan Grit Formation. In this case the older Jura Quartzite would have been thrust over the younger Bowmore Sandstone (=Crinan Grits). Finally, it should be stressed that there is as yet no consensus as to the precise significance of the Loch Skerrols Thrust as a major tectonic structure, nor to the stratigraphical affinity of the Bowmore Sandstone, and it has even been argued that the lithologies could be consistent with the Grampian Group (Stephenson and Gould, 1995).

21.4 Conclusions

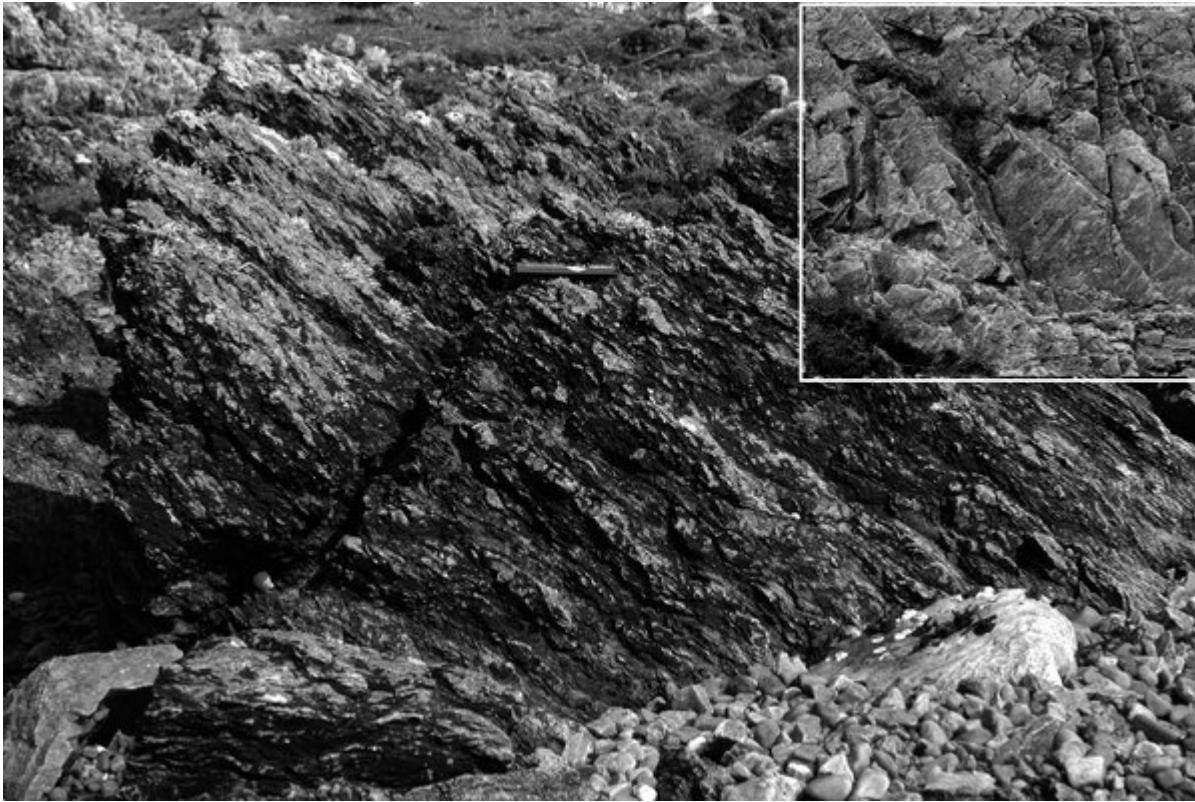
The Bun-an-uillt GCR site includes the only exposure of the Loch Skerrols Thrust, one of the more enigmatic structures of the Scottish Caledonides, and hence is of great national importance. However, due to poor exposure its tectonic significance and the relationship between the rocks that lie above and below it are poorly understood. The Jura Quartzite lies above the thrust, and the Blackrock Grit Formation of the Bowmore Sandstone Group lies below. The tectonic significance of the thrust is therefore important in defining the stratigraphical status of the Bowmore Sandstone Group, which has been variously correlated with the Torridonian, the Moine or the Dalradian. The most recent interpretations have suggested that the thrust is not a major tectonic boundary (such as the Moine Thrust) and, therefore, that the

Bowmore Sandstone may be the lateral equivalent of rocks belonging to the Upper Argyll Group of the Dalradian.

References



(Figure 2.47) Map of the Loch Skerrols Thrust on the east side of Loch Gruinart, Isle of Islay showing the Bun-an-Uillt GCR site (after Fitches and Maltman, 1984).



(Figure 2.48) (a) The main exposure of cataclastic rocks within the Blackrock Grit Formation, below the Loch Skerrols Thrust, [NR 2950 6930], c. 300 m south-west of Bun-an-Uilt, Islay. Scale is 5 cm long. (b) Possible stretching lineation in the Jura Quartzite, above the Loch Skerrols Thrust [NR 2947 6919]. Scale is 5 cm long. (Photos: P.W.G. Tanner.)