Dalradian rocks of the South-West Highlands

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Contents

The Dalradian rocks of the South-west Highlands — introduction

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Introduction

Dalradian rocks outcrop over a wide area in the Scottish Highlands immediately to the northwest of the Highland Boundary Fault. They form a very thick sequence of sediments, of late Precambrian to Cambrian age, which was deposited in part of the Caledonian geosyncline. Unlike the underlying sediments of the Moine Series, which are a monotonous sequence of impure sandstones and shales, the Dalradian Series is a lithologically diverse sequence of conglomerates, sandstones, limestones, dolomites and shales. The deposition of these sediments was interrupted on occasion by the eruption of volcanic rocks, accompanied by the voluminous intrusion of dolerite sheets and sills. These rocks were then deformed and metamorphosed during an early stage of the Caledonian orogeny, probably at the end of Cambrian times.

Although an emphasis has been placed on the structure and metamorphism of the Dalradian rocks, there are many areas of low-grade metamorphism where the deformation is relatively slight. The rocks of such areas can still be studied to advantage as sedimentary rocks from a stratigraphic and sedimentological viewpoint. This is certainly true of the Dalradian rocks in the South-west Highlands, defined as extending from Ballachulish and Lochaber in the north-east, to Islay, Jura, South-west Argyll, Cowal and Rosneath in the south-west. It is this area which is covered by the present series of excursion guides.

Stratigraphy and depositional history

The mapping of the South-west Highlands by the Geological Survey led to the recognition of a number of local successions for the Dalradian rocks. The correlation of these successions with the standard sequence of Ballachulish and Central Perthshire is shown in (Table 1). It should be noted that some formations are named after a particular lithology. This refers to the dominant lithology which typifies the formation in its type area. Other lithologies may be present, while facies changes may occur as the formation is traced throughout its outcrop. Other formations are named after the metamorphic grade of the rocks by means of terms such as slate, phyllite and schist. However, the metamorphic grade of the rocks may change outwith the type-area of the formation.

It is convenient to divide such an extended sequence as the Dalradian by the use of marker-horizons. The Loch Tay Limestone serves as the base of the Upper Dalradian, while the Portaskaig Boulder Bed is taken as the base of the Middle Dalradian. The Lower Dalradian consists of all those formations below the Portaskaig Boulder Bed, lying above the lowermost quartzite in the succession.

Few fossils have been found in the Dalradian rocks of the South-west Highlands. The agnostid trilobite *Pagetia* indicates that the Leny Limestone has a topmost Lower Cambrian age, although its stratigraphic position within the Upper Dalradian is rather uncertain, while an acritarch fauna from the Tayvallich Limestone, which locally defines the base of the Upper Dalradian, has also a Lower Cambrian age. Otherwise, there is little fossil evidence which could be used to erect a biostratigraphy. This means that the sedimentological approach to the Dalradian must be based on the cruder foundations of a lithostratigraphy, erected by means of lithological correlation.

Such a stratigraphy should preferably be divided by marker-horizons of strict contemporaneity. The probable origin of the Portaskaig Boulder Bed as a glacial tillite is important in this respect since it is likely to have formed in response to a short-lived climatic event. Similarly, the Loch Tay Limestone is a relatively thin formation extending for a long distance along the strike which is unlikely to be markedly diachronous. Such an argument may also be applied to other formations of limestone or black slate, particularly if they are found within a sequence of lithologically diverse formations. It is a characteristic feature of the Lower Dalradian, at least, that such formations can be traced for long distances along the strike without any marked changes in lithology. However, the Middle and Upper Dalradian rocks often show evidence of major changes in facies, implying that these formations have boundaries which are diachronous to some extent.

It is not proposed to describe systematically each formation in the Dalradian sequence. However, some generalities can serve as an introduction to the stratigraphic record and its interpretation in terms of depositional history. Although the sequence has been divided into three parts by the Portaskaig Boulder Bed and the Loch Tay Limestone, the depositional history falls naturally into two stages. The first stage resulted in the deposition of shallow-water marine sediments on an unstable shelf, while the second stage was associated with the development of a sedimentary trough, resulting in the deposition of sediment in much deeper water. This difference in depositional environment is reflected by the nature of the various formations.

Deposition on a shallow shelf

The first stage in the sedimentary history of the Dalradian was marked by the deposition of a varied sequence of sandstones, limestones, dolomites and shales, now forming the whole of the Lower Dalradian and the lower part of the Middle Dalradian, below the horizon of the Jura Slates.

The sandstones are represented by a number of quartzite formations. The Binnein Quartzite is a well-sorted and fine-grained ortho-quartzite of considerable purity; the Eilde, Glencoe and Islay Quartzites are generally fine-grained but somewhat felspathic ortho-quartzites; while the Appin Quartzite is a coarse-grained arkose showing evidence of deposition in a higher-energy environment than the other quartzites. Cross-bedding on various scales is a characteristic feature of all these quartzites, suggesting that they were deposited in shallow water, possibly under the influence of tidal currents.

The limestones and dolomites include some formations which also show clear evidence of deposition in shallow water. In particular, sandy dolomites with ripple-drift bedding are found in the Appin Limestone and the Bonahaven Dolomite. Algal stromatolites are developed in the latter formation, and may be indicative of intertidal condi tions. Stromatolites are also found in the Islay Limestone, associated with mud-flake breccias formed by sub-aerial desiccation and erosion. Beds of oolitic limestone are also present in this formation, indicating the action of currents in shallow water. However, dark, fine-grained limestones such as the Ballachulish and Lismore Limestones appear to have been deposited in deeper water.

The shales are now represented by formations which can be divided into two groups.

Firstly, the Ballachulish, Cuil Bay and Mullach Dubh Slates are dark, carbonaceous pelites which were laid down under conditions of restricted circulation, probably in relatively deep water. Secondly, the Eilde, Binnein, and Leven Schists, and the Appin Phyllites are pelitic sediments which were deposited under conditions of open circulation, beyond the reach of coarse sediment.

The outcrop of these various formations is rather restricted since they can only be traced in a discontinuous manner from Islay and Jura to Ballachulish and Lochaber.

The following succession of quartzites and schists below the Ballachulish Limestone is only seen around Kinlochleven to the east of Ballachulish. The Fort William Slide cuts out this part of the succession to the west, while the whole succession is only represented by a single quartzite overlain by a pelitic schist farther to the south in Glen Orchy.

The formations extending upwards from the Ballachulish Limestone to the top of the Lower Dalradian are poorly exposed on Islay. However, they are well-developed in the Ballachulish district, especially in the west. The succession becomes attenuated as it is traced to the east, although it is uncertain whether this is the result of deformation or the consequence of an original change in facies.

The sequence of Middle Dalradian formations above the Islay Limestone can be traced from Islay into the southern part of the Ballachulish district. The Portaskaig Boulder Bed at the base has its thickest development on Islay and the Garvellachs. This horizon is only represented by one or two sporadic outcrops farther to the north-east. The overlying Islay Quartzite is 5 km thick in Jura, but it thins rapidly south-west and north-east along the strike. Palaeocurrent evidence shows that this lenticular mass of quartzite was deposited by currents flowing towards the north-east (Anderton, Guide Number 4). Although it may not be the case, this direction may correspond to the depositional slope.

Although the formations above the Islay Limestone are only 1 km thick in Ardmucknish, where they form a sequence of fine-grained quartzites and dolomitic flags, they show marked changes in thickness and facies as they are traced across the strike to the east into Glen Creran. They result in a 7 km thick sequence of pebbly quartzites and black slates, evidently deposited in a sedimentary basin which was undergoing differential subsidence to the south-east. The development of this basin is a precursor of the important changes which mark the beginning of the second stage in the sedimentary history of the Dalradian.

Deposition in a sedimentary trough

The horizon of the Jura Slates marks a widespread change, in sedimentation and depositional environment, which results in the deposition of the upper part of the Middle Dalradian and the whole of the Upper Dalradian in the deeper waters of a sedimentary trough.

The psammitic formations deposited during this stage of the sedimentary history include the Port Ellen Pebbly Quartzite (= Scarba Conglomeratic Group), the Crinan Grits (= Erins Quartzite) and the Loch Avich Grits (= Beinn Bheula Schists). All these formations are typically composed of coarse-grained elastic sediments which may on occasion be classed as conglomerates. The Port Ellen Pebbly Quartzite and the Crinan Grits are similar in lithology, being composed of poorly-sorted, sometimes felspathic, coarse-grained, pebbly quartzites, while the Loch Avich Grits are poorly-sorted, chloritic and generally felspathic, schistose grits which can best be described as metagreywackes. Graded bedding is a characteristic feature of all these formations, as witness to their deposition by means of turbidity currents.

Several pelitic formations are found within the succession.The Easdale Slatesare dark, graphitic slates and thin limestones which occur above the Scarba Conglomeratic Group. They are overlain by the Craignish Phyllites (= Ardrishaig Phyllites), forming a thick sequence of calc-sericite phyllites with sandy limestones and fine-grained quartzites. These rocks are succeeded by the Crinan Grits, above which the Tayvallich Limestone (= Loch Tay Limestone) marks the base of the Upper Da1radian. This formation consists of black, sometimes gritty, slates which are locally associated with slump-breccias, and dark limestones which occur either as laminated beds of fine-grained limestone showing ripple-drift bedding or as graded beds of coarse-grained limestone carrying detrital grains of quartz and felspar. The deposition of these rocks was closely followed by the eruption of the Tayvallich Pillow Lavas. This part of the sequence is described by Gower (Guide Number 3). Although volcanic rocks (sensu stricto) are restricted to the Loch Awe Syncline, they are represented farther to the south-east by the Green Beds as sedimentary rocks rich in amphibole, chlorite and epidote resulting from *the inclusion* of volcanic detritus. These rocks are overlain by the thick sequence of schistose grits which forms the bulk of the Upper Dalradian. The deposition of these rocks appears to have been interrupted by another episode of volcanic activity, giving rise to the Loch Avich Lavas (Borradaile, Guide Number 6).

All these formations were deposited in a sedimentary trough which evolved through a broadening of the basin which previously influenced sedimentation in the Glen Creran district. The horizon of the Jura Slatesis taken as marking the establishment of this trough since all the psammitic rocks above this horizon were laid down by means of turbidity currents. Facies changes associated with the Crinan Grits serve to define the northwestern. margin of the trough, while sparse palaeocurrent evidence from the Ardrishaig Phillites, the Crinan Grits, the Tayvallich Limestone and the Loch Avich Grits indicates that these formations were deposited by turbidity currents flowing north-east or southwest along its axis.

The Scarba Conglomerate Group and the Easdale Slate were first laid down within the sedimentary trough once it became widely established. The former formation was deposited by turbidity currents flowing down a northerly slope, while the latter formation was laid down in the trough farther to the north-east, beyond the reach of the turbidity currents. The details are described by Anderton, Baldwin and Johnson (Guide Numbers 4 & 5). A thick sequence of black slates is not found farther south-west than Scarba. Instead, the two formations already mentioned are together represented by the Port Ellen Pebbly Quartzite, formed by an influx of turbidites into an area of lesser subsidence.

The deposition of these rocks was followed by a more uniform period when the Craignish and Ardrishaig Phyllites were deposited under conditions of open circulation, perhaps in relatively shallow water. This was followed by an influx of coarser sediment, carried by turbidity currents flowing along the axis of the trough and laid down as the pebbly quartzites of the Crinan Grits.

The Crinan Grits show significant changes in thickness and facies across their outcrop. The formation thins to the north-west across the Loch Awe Syncline, and the sediments become better-sorted and more mature in this direction. Accordingly, the north-western margin of the sedimentary trough can be recognized as running along the north-western side of the Loch Awe Syncline. The south-eastern margin of this trough has not been recognized with certainty. The Crinan Grits are correlated with the Erins Quartzite, which forms a thick sequence of rather fine-grained quartzites to the south-east of the Ardrishaig Anticline in Knapdale and North Kintyre. These rocks were presumably deposited within the trough. However, the Erins Quartzite can be traced north-east along the strike towards the head of Loch Fyne where it is represented by a thin sequence of pelitic rocks known as the Garnetiferous Mica-Schist (= Ben Lui Schists). Although this marked change in thickness and facies may mark the south-eastern margin of the trough, it is also possible that the Garnetiferous Mica-Schist is the distal equivalent of the Erins Quartzite, deposited within the trough beyond the reach of turbidity currents.

There was then a pause in the abundant supply of coarse elastic sediment, marked by the deposition of the Tayvallich Limestone and followed closely by the onset of basic vulcanicity. Although the Tayvallich Limestone appears to show little change in thickness and facies across the Loch Awe Syncline, it is represented farther to the south-east by the Loch Tay Limestone as a thinner sequence consisting predominantly of fine-grained limestone.

The final stage in the sedimentary history was marked by the further influx of coarse elastic sediment, resulting in the deposition of the Loch Avich Grits and the Beinn Bheula Schists. It seems likely that the axis of the sedimentary trough migrated to the south-east during this stage, since the Beinn Bheula Schists appear to form a much thicker sequence of schistose grits to the south-east of the Ardrishaig Anticline than the Loch Avich Grits to the north-west.

Structural evolution

The structure of the Dalradian rocks in the South-west Highlands is the result of a polyphase history of deformation. Each phase in this deformation history produced a cleavage, axial-planar to folds, of bedding and the earlier cleavages. It is the superposition of structures belonging to successive phases of deformation, upon pre-existing structures developed in response to earlier phases of deformation, which results in the rather complex structure now shown by these rocks.

Methods of structural investigation

A polyphase history of deformation is recognized to affect the Dalradian rocks in the South-west Highlands because the structures produced by the various phases of deformation can be dated relative to one another. As shown by C.T. Clough (1897), this merely requires an extension of the normal methods used in historical geology.

Cleavages and folds are considered to belong to the same phase of deformation if the cleavage is axial-planar to the fold. If this is not the case, either the cleavage or the fold is the earlier structure. The cleavage is earlier if it is folded to pass around the hinge of the fold, whereas the fold is earlier if the cleavage cuts across the axial-plane of the fold. Interference patterns typical of refolding are developed where a later set of folds is superposed on an earlier set. The earlier folds can be recognized since their axial planes are folded around the hinges of the later folds.

The cleavages produced in response to particular phases in the deformation may have characteristic features which are an aid in their recognition. Thus, the earliest phase in the deformation history is assumed to produce a slaty cleavage, affecting bedding as the only fabric in the rock-mass prior to deformation. Subsequent cleavages affect the slaty cleavage as well as bedding, so that they form strain-slip or crenulation cleavages. The character of these cleavages depends to a considerable extent on their relative age. There is a tendency for the deformation to decrease in intensity with each successive phase in the deformation history. This means that the earlier strain-slip cleavages tend to be closer and more penetrative than the later crenulation cleavages. Moreover, the formation of the earlier cleavages often takes place under conditions of progressive metamorphism, so that recrystallization and new mineral growth tend to destroy any earlier fabric which may be present. Accordingly, there is often difficulty in distinguishing the early cleavages from one another, particularly since these cleavages often have the appearance in the field of a slaty cleavage.

Minor folds share the same axial-planar cleavage as major folds belonging to the same phase in the deformation history. As a consequence of this fact, the vergence1 of minor folds changes as they are traced across the hinge of a major fold. Alternatively, if minor folds are not present, there is a corresponding change in the relationship of bedding to the axial-planar cleavage across the major fold. These relationships can be used to map the major folds belonging to a particular phase of deformation, provided that minor structures can be recognized as belonging to the same phase. They can also be used to identify minor structures as belonging to particular phases of deformation, provided that the major folds can be mapped by other means.

1 Vergence refers to the sense of rotation shown by minor folds. This may be clockwise or anti-clockwise, as viewed down-plunge, resulting from a fold pattern which is either Z-shaped or S-shaped, respectively.The vergence is defined by the horizontal direction, as measured in a plane normal to the fold-axis, towards which the upper component of this rotation is directed. The direction of vergence corresponds to the direction in which an antiform is first encountered, while it is opposite to the direction in which a synform is first encountered.

Although the outcrop pattern of sedimentary formations may reflect the presence of major folds, it is preferable to use sedimentary structures such as cross-bedding and graded-bedding to map the major folds present in the rocks. The vergence and orientation of the minor structures can then be studied to determine whether or not these structures are congruent with the major folds. Only those structures which are congruent with the major folds, in that they share the same axial-planar cleavage, can reasonably be identified as belonging to the same deformation phase.

Different relationships arise if the minor structures are not related to the major folds present in the rocks. These structures may be earlier than the major folds, so that they show systematic changes in orientation which can be directly related to the major folds, or they may be later than the major folds, across which they are superposed without any marked change in orientation.

The deformation history

An extended sequence of deformation phases can be recognised in the Dalradian rocks of the South-west Highlands. However, only the first phase in this deformation history affects the rocks throughout the whole region. It produces structures which can be identified wherever subsequent deformation and metamorphism does not prevent their recognition. Structures developed by the subsequent phases of deformation are characteristically found in discrete zones. This means that the deformation histories recognized from local areas within the South-west Highlands generally consist of fewer phases than the regional deformation history. Indeed, there are many areas where only the first phase in the deformation history can be recognized.

The deformation history can be divided into primary and secondary stages. The primary deformation consists of all those phases related to the development of early, but not necessarily recumbent, folds which control the overall disposition of the stratigraphic formations. The secondary deformation is defined by the subsequent phases in the deformation history, resulting in structures which were superposed on the primary structures without any genetic relationship to these structures.

The earliest phase in the primary deformation produced a slaty cleavage axial-planar to folds of bedding. This was followed by the second deformation, giving rise to a closelyspaced and rather penetrative strain-slip cleavage which is axial-planar to folds of bedding and the first cleavage. These structures appear to be congruent with the major folds which started to develop during the first deformation and which continued to evolve during the second deformation. The second deformation can, therefore, be termed a "symmetry-constant continuation" of the first deformation since both sets of structures have the same vergence and facing in relation to the major folds developed by the primary deformation.

A characteristic feature of these early stages in the deformation history is shown by the development of a fibrous mineral lineation on the first and second cleavages. This lineation marks the direction of maximum extension in the rock, as shown by the stretching of rock fragments, detrital grains of quartz and feldspar, pre-tectonic blebs of pyrite and carbonate, ooliths and felspar phenocrysts, parallel to this direction. The stretching-direction, to use the phrase of C. T. Clough (1897), has a rather constant north-west to south-east trend throughout the South-west Highlands, resulting from its steep down-dip attitude on first and second cleavage-planes with Caledonoid trends.

The first and second folds have axes which apparently formed with Caledonoid trends, at a high angle to the stretching-direction developed on their axial-planar cleavages. This attitude is preserved in areas of slight deformation, north-west of the Loch Awe Syncline and along the Highland Border. However, as these structures are traced into areas of more intense deformation, the fold-axes tend to rotate, within the cleavages axial-planar to these folds, towards the stretching-direction. This results in early fold axes plunging steeply north-east and south-west in the core of the Ardrishaig Anticline, trending north-south across the Loch Tay Inversion, and plunging steeply north-east and south-west in the core of the Aberfoyle Anticline. All these folds have axes which are oblique to the stretching-direction, and which can be strongly curved within their axial-planar cleavages.

The final stage in the primary deformation is marked by cross-folding, affecting zones of intense deformation which are associated with the Loch Skerrols Thrust in Islay. The mylonitic banding within these zones, formed by the attenuation of bedding, is folded to form cross-folds with their axes parallel to the stretching-direction. These folds have therefore, a north-west to south-east trend which might be considered characteristic of "cross-folds". However, it should be realized that the first and second folds may have a similar trend, even although they have axes which are not parallel to the stretching direction.

The secondary deformation follows the primary deformation. It consists of several phases of deformation which resulted in the formation of crenulation cleavages axial planar to folds of bedding and the primary cleavages. It is only on occasion that the secondary structures profoundly modify the nature of the primary structures, thereby exerting an influence on the outcrop pattern of the stratigraphic formations.

The major structures

Our knowledge of the major structures affecting the Dalradian rocks in the Southwest Highlands stems mainly from the work ofE. B. Bailey. Thus, the Tay Nappe (part of Bailey's Iltay Nappe Complex), the Loch Awe Syncline and the Islay Anticline still stand as the major structures developed in the Middle and Upper Dalradian. Similarly, the Appin Syncline, the Kinlochleven Anticline and the Ballachulish Syncline were first established by Bailey in 1910 as the major structures developed in the rocks of the Ballachulish district. However, the attribution of these structures to particular phases in the deformation history has undergone a major revision, especially with regard to the first-mentioned structures, as the result of employing the methods already described.

The Islay Anticline, the Loch Awe Syncline and the Ardrishaig–Aberfoyle Anticline (as the anticlinal core of the Tay Nappe) are now all considered to be primary structures which started to develop during the first phase of deformation and which continued to evolve during the later stages of the primary deformation. The minor structures associated with these major folds fan through the vertical from the north-west facing Islay Anticline, across the upward-facing Loch Awe Syncline, to the south-east facing Ardrishaig Anticline. They are then arched across the secondary Cowal Antiform to become associated with the downward-facing Aberfoyle Anticline along the Highland Border. Accordingly, the Aberfoyle Anticline roots to the north-west across the Cowal Antiform in the Ardrishaig Anticline, while the intervening rocks between these anticlines form the Loch Tay Inversion.

This means that a zone of divergence can be recognized in the South-west Highlands, separating primary structures which face in opposite directions. However, although the structural cross-section just described from Islay to the Highland Border is relatively simple, it clearly becomes more complex as the structures are traced north-east to affect the rocks lying at a deeper level in the Ballachulish district.

Recent work has confirmed that the structure of the Ballachulish district is similar to that envisaged by Bailey, except for a single detail of considerable importance. Bailey recognized that the primary structures are affected by a secondary fold known as the Stob Ban Synform. However, he did not realize that the Kinlochleven Antiform occurs farther to the south-east as a fold complementary to the Stob Ban Synform. Accordingly, the primary structures face downwards between the Stob Ban Synform and the Kinlochleven Antiform, while they face upwards on either side of this zone (Roberts and Treagus, Guide Number 7). This means that overall the primary structures of the Ballachulish district face upwards to the north-west, at least at the level of the Moine-Dalradian boundary. Thus, these structures appear to be broadly equivalent to the structures facing north-west at a higher structural level in the Iltay Succession, farther to the south-west. Primary structures facing towards the south-east can be traced from the Highland Border across the Loch Tay Inversion as far north-west as the Glen Orchy district, where they affect the Moine and Dalradian rocks lying below the Tay Nappe on the south-east side of the Glen Orchy Antiform. Accordingly, it would appear that the zone of divergence lies within the Moine outcrop between Glen Orchy and the Ballachulish district. The interested reader is referred to a paper published by us in the last issue of this journal, which shows how all these major structures may be traced throughout the South-west Highlands, as shown in Figure 1.

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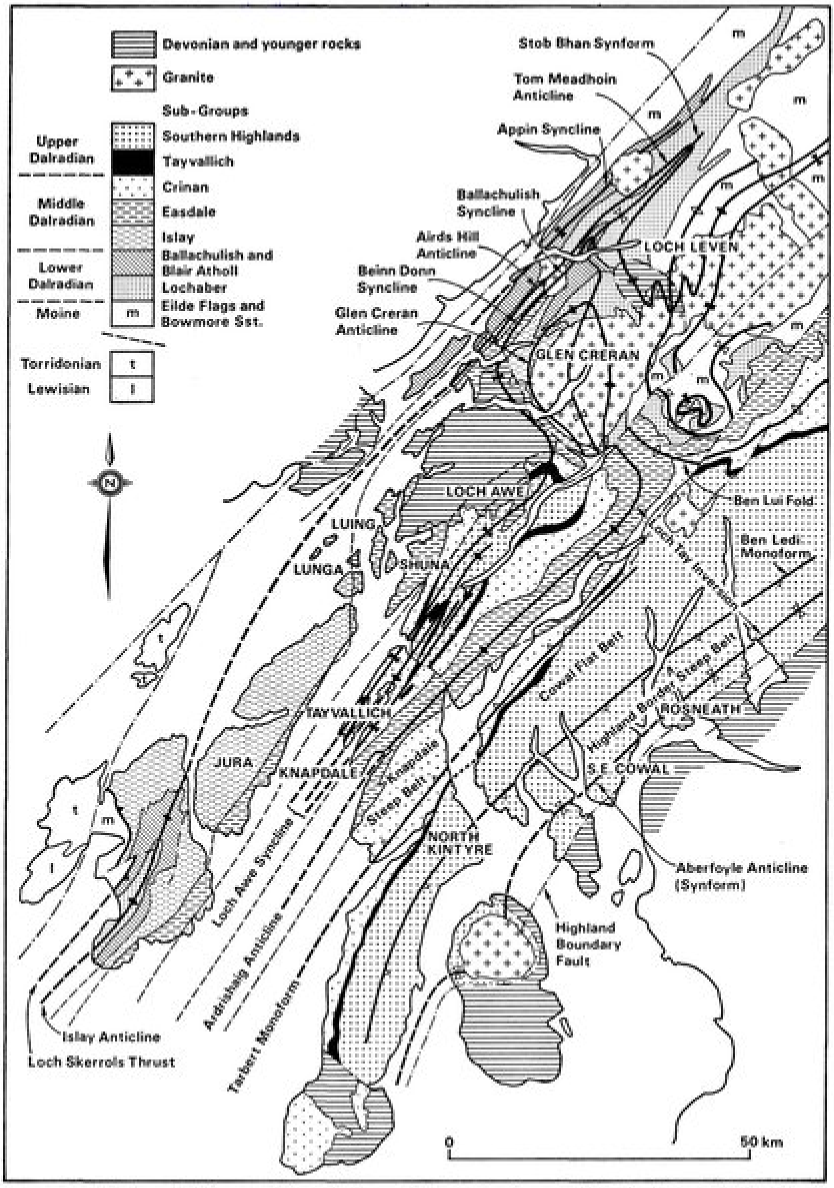
Figures and tables

(Figure 1) Simplified geological map of the Dalradian rocks in the South-west Highlands of Scotland, showing the axial traces of the major folds according to Roberts and Treagus (1977). Place-names in capitals give the locations of the various field-areas covered by this series of excursion guides. Note that the stratigraphic units correspond to the various sub-groups as given in (Table 1) and (Figure 2).

(Figure 2) Diagrammatic cross-sections through the Dalradian rocks in the South-west Highlands of Scotland, showing the structural relations of the major folds established in (Figure 1). Arrows give the facing of the early folds. These sections have been drawn on the assumption that the upper limb of the Ardrishaig–Aberfoyle Anticline is much less deformed than the lower limb.

(Table 1) Lithostratigraphy compiled for the Dalradian rocks in the South-west Highlands of Scotland after Harris and Pitcher (1976).



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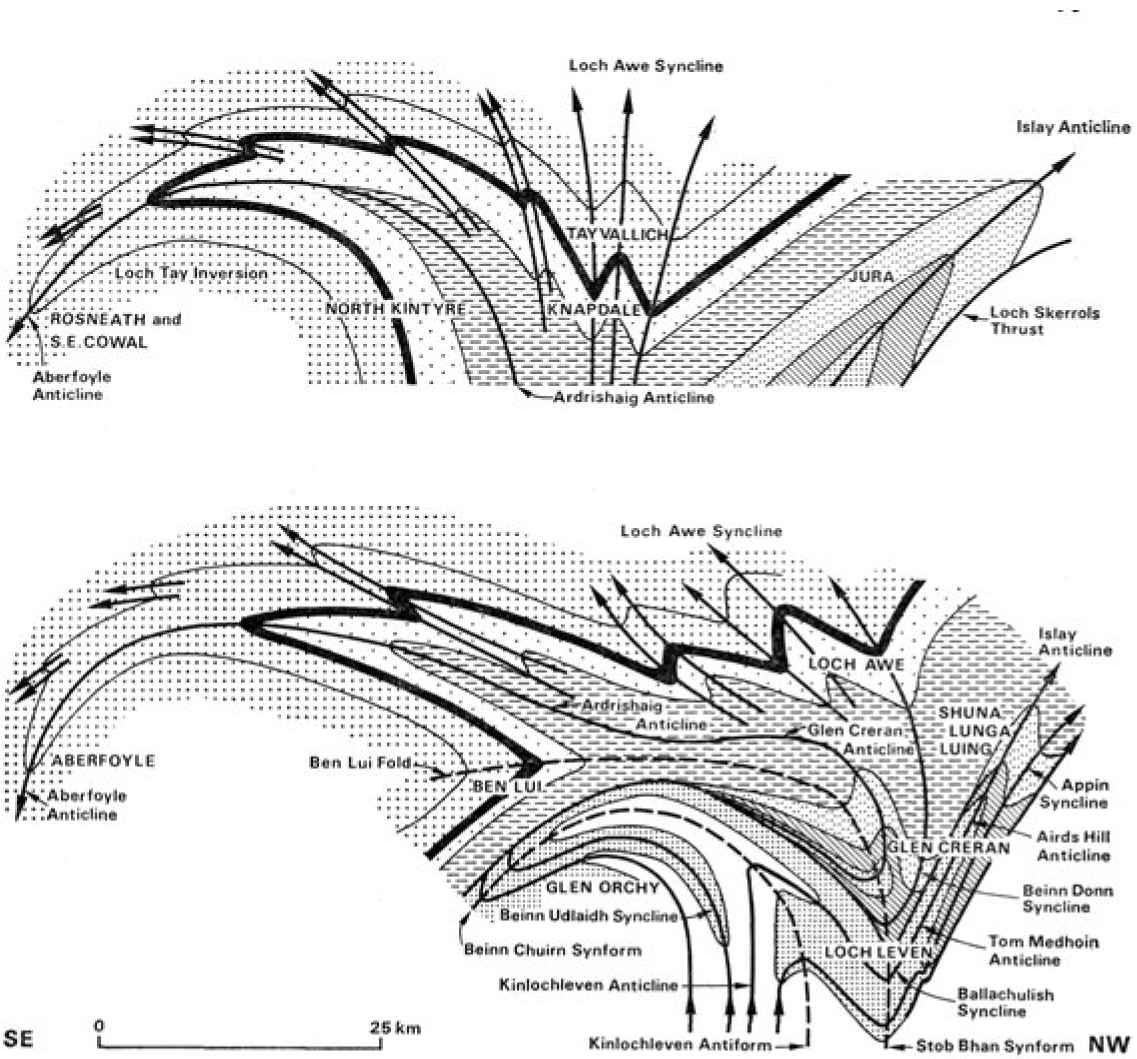

(Figure 2) Diagrammatic cross-sections through the Dalradian rocks in the South-west Highlands of Scotland, showing the structural relations of the major folds established in (Figure 1). Arrows give the facing of the early folds. These sections have been drawn on the assumption that the upper limb of the Ardrishaig–Aberfoyle Anticline is much less deformed than the lower limb.

		Islay & Tayvallich	Ballachulish & Loch Awe	Glen Creran	Knapdale & Cowal	Central Perthshire
Southern Highland (Upper Dalradian)		Kells Grit Tayvallich Volcanics	Loch Avich Lavas Loch Avich Grit Tayvallich Volcanics		Innellan Group with Loch Fad Conglomerate Bullrock Greywacke ? ? ? Dunoon Phyllite Beinn Bheula Schist Green Beds Glen Sluan Schist	Highland Border Series Upper Leny Grit Leny Limestone and Shale Lower Leny Grit ? Aberfoyle Slate Correlation uncertain Ben Ledi Grit with Green Beds Pitlochry Schist
Argyll (Middle Dalradian)	Tayvallich	Tayvallich Limestone	Kilchrenan Conglomerate Tayvallich Slate and Limestone (thin ash bands)		Loch Tay Limestone	Loch Tay Limestone
	Crinan	Crinan Grit Ardmore Grit Conglomerate	Crinan Grit		Stonefield Schist Garnetiferous Mica Schist Erins Quartzite (Upper part)	Ben Lui Schist
	Easdale	Limestone and Laphroaig Quartzite Port Ellen Phyllite Scarba Conglomerate Jura Slate	Shira Limestone and Slate Ardrishaig Phyllite Degnish Limestone Easdale Slate	Ardrishaig Phyllite (Bonawe Succession) Pebbly Quartzite Group	Stronachullin Phyllite Erins Quartzite (Lower part) Ardrishaig Phyllite Easdale Slate	Farragon Beds Ben Lawers Schist Ben Eagach Schist Carn Mairg Quartzite
	Islay	Bonahaven Dolomite Port Askaig Tillite	Islay Quartzite Dolomitic Beds Tillite	Creagan Creran Bridge Quartzite Creran Flags		Perthshire Quartzite Series: Killiecrankie Schist Schichallion Quartzite Dolomitic Beds & Boulder Bed Schichallion Boulder Bed
Appin (Lower Dalradian)	Blair Atholl	Islay Lst. (No correlation implied) Mullach Dubh Phyllite Ballygrant Limestone Baharradail Phyllites (Mull of Oa Phyllite)	Lismore Limestone Cuil Bay Slate	Lismore Limestone		Pale Group: Pale Limestone Banded Group Dark Group: Dark Limestone Dark Schist
	Ballachulish	Cnoc Donn Quartzite (Transition Group) Cnoc Donn Slate Kintra Limestone	Appin Phyllite and Lst. Appin Quartzite (Transition Group) Ballachulish Slate Ballachulish Limestone	Appin Phyllite and Lst. Appin Quartzite (Transition Group) Ballachulish Slate Ballachulish Limestone		Relationship Uncertain Kinlochlaggan Limestone Local Boulder Bed
	Lochaber (Transition)	Kintra Phyllite Maol an Fhithich Quartzite Bowmore Sandstone	Leven Schist Glencoe Quartzite Binnein Schist Binnein Quartzite Eilde Schist Eilde Quartzite Eilde Flags (Moine)	Leven Schist Glencoe Quartzite		Kinlochlaggan Quartzite Monadhliath Schist Eilde Quartzite Struan Flags (Moine)

(Table 1) Lithostratigraphy compiled for the Dalradian rocks in the South-west Highlands of Scotland after Harris and Pitcher (1976).