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West Highland Sculpture, Scotland – Defining a Gaelic Lordship

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West Highland Sculpture; Lordship of the Isles; rock types; petrology; magnetic susceptibility

1. Abstract

The graveyards of the West Highlands of Scotland contain many commemorative crosses and grave-slabs dating from the 14th to mid 16th century. They are carved in a distinctive style from a variety of rock types. Their distribution largely coincides with the Lordship of the Isles, a powerful Gaelic Princedom, often in conflict with the kings of Scotland. It defines the culture and influence of the Lordship. A study of rock types and quarry sources, including innovative non-destructive measurements of magnetic susceptibility, is leading to a reassessment of where the sculpture was carved and what that tells us about the extent of power and patronage in the Lordship.

2. Introduction

West Highland burial grounds and churches contain an outstanding corpus of over 600 grave-slabs and commemorative crosses dating from the late 14th to the middle of the 16th century (fig. 1). Although many of the decorative motifs used are derived from wider European traditions of Romanesque and Gothic art these are clearly the work of local schools of craftsmen, patronised by the leaders of West Highland society. The grave-slabs are not matched by any in other parts of Britain and Ireland, and commemorative stone crosses are unique to the West Highlands in the Late Middle Ages. The carvings give a remarkable insight into the culture of an area and society that was largely independent of the rest of Scotland and most of which was unified under the leadership of the MacDonalds, Lords of the Isles and Earls of Ross. They depict the people, their equipment and even their activities.

A magisterial study of this sculpture was published in 1977 by K. A. Steer and J. W. M. Bannerman. They identified four schools of carvers in the 14th and 15th centuries, and a fifth, along with various independent workers, operating in the 16th century. This scheme depends solely on a stylistic analysis of the sculpture. Some of the pieces of sculpture have commemorative inscriptions that are an aid to dating but only four are inscribed with the name's of their makers, three of them arguably by the same man. Steer and Bannerman further suggested locations for their five schools on the basis of intuition and the distribution of the sculpture. The most prolific and important they placed on the island of Iona, the main religious centre in the West Highlands, with a Benedictine monastery which doubled as the cathedral for the Isles from 1498, and an Augustinian nunnery. Iona also has by far the largest collection of West Highland sculpture in one place, some 106 pieces. The others they located in the region of Loch Awe, around Loch Sween, in Kintyre, and on the Island of Oronsay where there was an Augustinian priory, founded c. 1325 to 1353 (fig. 1).

This is not the place to attempt a thorough review of the sculpture, but the four examples selected to illustrate this paper may give a flavour of the range. Firstly, there is a grave-slab (fig. 2a, after Drummond 1881, pl. XXI, 2) with a long rectangular panel of plant scroll within a broad border. This one is at Iona Abbey and may date to c. 1500. All slabs of this type are assigned by Steer and Bannerman to the Iona School, and are described as class II slabs.

Figure 2b (White 1873, pl. XI) shows a cross that now serves as the market cross of Campbeltown in Kintyre but which probably came from the church of Kilkivan, a few kilometres away. It typically has a disc head with a Crucifixion (now defaced). Other panels, which probably contained the images of the clerics who commissioned it, have also been chiselled flat. The two priests, father and son, are named in an inscription panel, and the son is documented as living in the late 14th century. The rest of the cross (front, back and sides) is covered with plant-scroll decoration and animals (RCAHMS 1971, 103–105).

Figure 2c (after White 1875, pl. XXVI) shows a grave-slab of the so-called Loch Sween School of the 14th and 15th centuries at Keills Chapel at the mouth of Loch Sween. A sword substitutes for the shaft of a cross with a head of interlace. Down one side of the sword is a plant-scroll design, and on the other a range of devices including a pair of shears, a comb, a casket and a harp. The last two are clearly identifiable from surviving examples as West Highland types. A worn inscription shows that the stone commemorates a father and son, possibly members of a hereditary family of harpists (Steer/Bannerman 1977). A recent re-interpretation of another inscription indicates that the carver was called O Cuinn (RCAHMS 1992, 91).

Figure 2d (after Drummond 1881, pl. XLI) is of a grave-slab at the Abbey of Iona with the effigy of a man in armour. He grasps a sword at his belt, and wears an aketon (a quilted jacket), a mail collar, and a bascinet on his head. There are two small angels above his shoulders and other decoration on the base-slab. The armour and sword are not significantly different from those employed in the 12th century but this monument probably dates to the late 15th century. An inscription on the pillow at the top indicates it was carved by Mael-Sechlainn O Cuinn.

Steer and Bannerman sought the advice of a British Geological Survey geologist, G. H. Collins, for guidance on the stone used by the sculptures. He was unable to undertake a systematic scientific analysis, but listed ten rock types, the most prevalent being 'calc-chlorite-albite-schist' (chlorite schist). The probable source for this was identified as a quarry at Doide on the shore of Loch Sween. Doide is the only actual quarry specified by Collins (Steer/Bannerman 1977, 195–200).

Fig. 1: Map showing the extent of the Lordship of the Isles and the Earldom of Ross, West Highlands of Scotland.

Collins notes that the Iona school of carvers not only used chlorite schist which he supposed came from Doide, some 90 km away by sea, but also, to a lesser extent, black pyritiferous slate and epidiorite. Neither of the latter two occur anywhere within 50 km of Iona. Works of the Iona School are distributed in 38 locations apart from Iona. While these are mostly close to the sea, considerable sea voyages are involved – up to 200 km. Oronsay is similarly remote from supposed sources of rock, but works of the Oronsay School, all dated to the 16th century, are distributed almost as widely as those of the Iona School. The products of the Kintyre School are mostly localised in Kintyre, but appear for the most part to be carved in chlorite or mica schist from further afield. Only the Loch Sween and Loch Awe Schools are located in areas that contain the rocks used by their carvers although Collins (in Steer/Bannerman, 1977, 195–200) was unable to identify specific quarries for these stones. In addition, the products of these schools are much more localised than those of Iona and Oronsay.

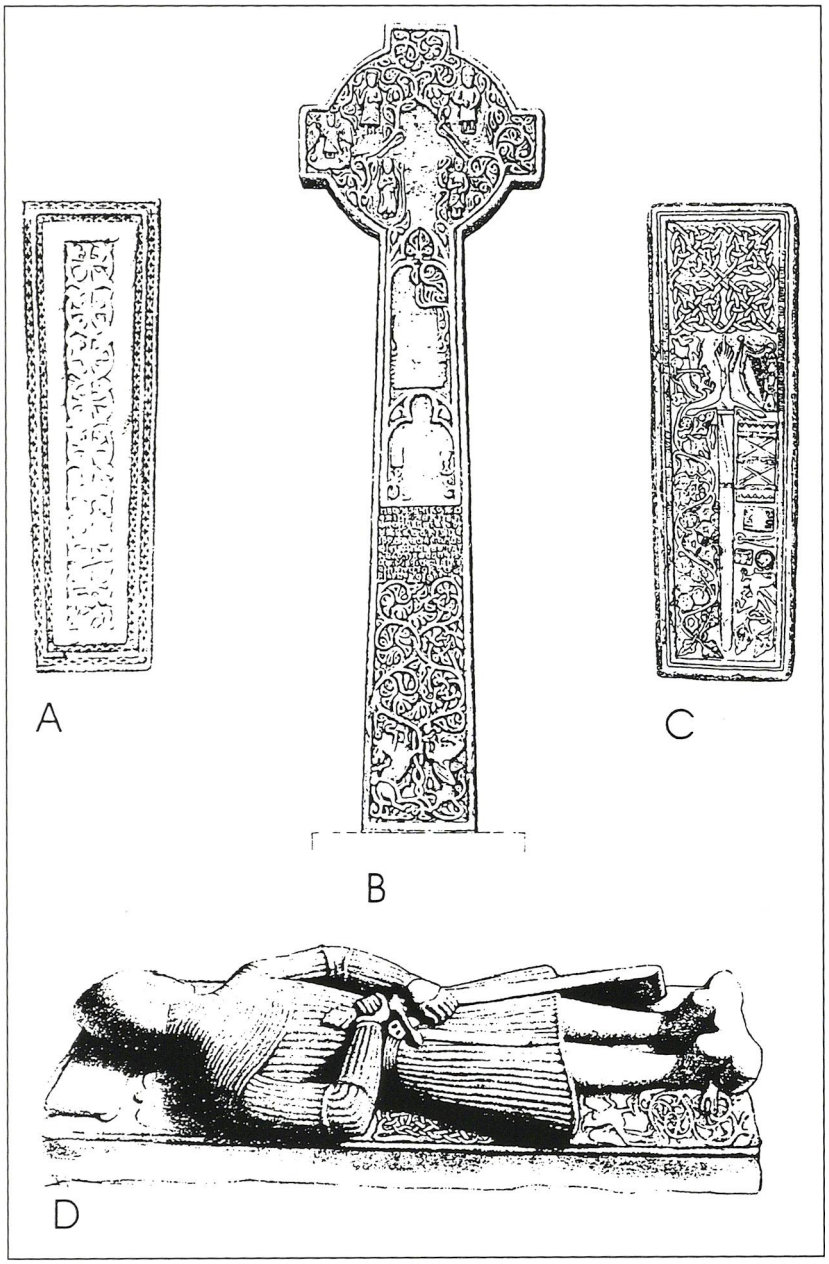

Fig. 2: Examples of West Highland sculpture. A) Class II grave slab, Iona. B) Cross, Campbeltown. C) Grave Slab, Keills Chapel. D) Grave slap with effigy, Iona.

Reassessment of all this work is now overdue, thanks to access to more sources of information and scientific techniques. Here we want to concentrate on two related problems, firstly, whether there really were schools as suggested by Steer and Bannerman, and, secondly, whether an alternative model would provide a more apt explanation of the place of the sculpture in medieval West Highland culture and society.

The first phase of the project has involved non-destructive techniques, namely detailed petrographic descriptions of the rock types and *in situ* measurement of magnetic susceptibility. This was undertaken on selected crosses, grave slabs and possible rock sources from Iona, Oronsay, Islay, Loch Sween and the Kintyre Peninsula. So far our work has been concentrated on two large collections of monuments on Iona and at the priory on the Island of Oronsay. The second phase has involved careful sampling from possible sources. These samples have been used for detailed microscopy and microanalysis and submitted for bulk chemical analysis using x-ray fluorescence (XRF). A third phase involving non-destructive x-ray fluorescence measurements of all the artefacts using a portable unit has been proposed. The non-destructive XRF measurements will be correlated to the more accurate chemical compositions obtained from sampling and destructive analysis.

3. Methodology

3.1 Petrological Analysis

All available sculptured stones have been examined using non-destructive petrological techniques in order to provide a ‚field identification' of the rock type. This type of petrological analysis has provided a basic identification of rock type and has been used to distinguish between general rock types. These rock types have been compared with a number of potential sources.

All examination includes the following measurements:

- colour (with reference to Munsell standard colour charts). Colour measurements from all weathered surfaces were obtained. In a small number of cases, it was possible to make observation of the unweathered colour of the sculptures;
- grainsize (with reference to standard grainsize measurements on the micron scale);
- macroscopic mineralogy (i.e. mineralogical content that can be ascertained by hand-specimen examination with hand lens);
- textural & structural characteristics such as schistocity, cleavage, jointing, bedding, cross-bedding, grainsize variation;
- clast distribution and composition;
- weathering characteristics.

Division of the specimens into "rock types" has been primarily based on the textural and mineralogical characteristics. Colour has been used only as a general guide to overall appear-

ance since in many cases, the sculptures have undergone varying degrees of weathering and/or cleaning and are covered in varying amounts of lichen all of which can significantly alter the colour of the surface of the specimen. The petrological examination of the sculptures indicates the use of at least thirteen different rock types including varieties of schist, metabasite, amphibolite, quartzite, slate, gabbro and sandstone.
In addition, thin sections of the rocks from possible quarry sites were examined to give a detailed mineralogy.

3.2 Magnetic Susceptibility

3.2.1 Background
Most igneous and metamorphic rock types contain varying amounts of ferromagnetic minerals such as magnetite. To a lesser extent sedimentary rocks, especially where they have been formed from the erosion of igneous and metamorphic material, also contain limited amounts of ferromagnetic material.
Measurements of magnetic susceptibility are by nature closely related to the content of magnetite and other iron minerals and can be used in characterising rock outcrops. By comparing the physical properties and magnetic susceptibility of the rock outcrop with those of the carved stone it is possible to evaluate the source(s) of the carved stones.
This technique has been employed in the provenancing of igneous rocks e.g. Roman granite columns (Williams-Thorpe/Thorpe 1993; Williams-Thorpe et al. 1996; Williams-Thorpe et al. 1997), greenstone axes (Markham 1997) and Charlemagne's 'black stones' (Peacock 1997).
Published material on the use of magnetic susceptibility data has virtually always referred to igneous and metamorphic rock types. Only a very small number of limited studies have employed magnetic susceptibility in describing sedimentary rocks. Floyd and Trench (1988) employed a Kappameter Model KT-5 in evaluating magnetic susceptibility contrasts in Ordovician greywackes and Hall *et al.* (2000) reported on the use of this technique in provenancing the sandstone of the Crieff Burgh Cross. Recent unpublished research by Ruckley in the Tarbat Peninsula, Inverness-shire, and on Islay has shown that the KT-9 Kappameter has an important role in provenancing

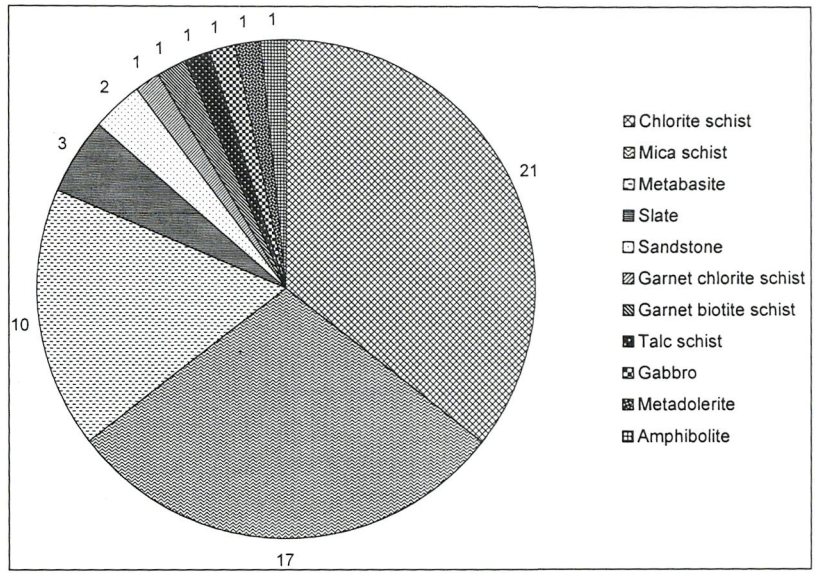

Fig. 3a: Rock types from 59 Medieval carved stones at Iona Abbey.

standing and carved stones ranging from Dalradian metabasites and metasediments to Old Red Sandstones and Palaeogene basalts.

3.2.2 Magnetic susceptibility methodology
The magnetic susceptibility was measured with an Exploranium KT-9 Kappameter (manufactured by Exploranium G S Ltd.) giving a measurement of the true susceptibility. It measures the volume magnetic content of rocks to extremely low levels, and thus can identify and classify minute quantities of magnetite, titanomagnetite, ilmenite and pyrrohite.

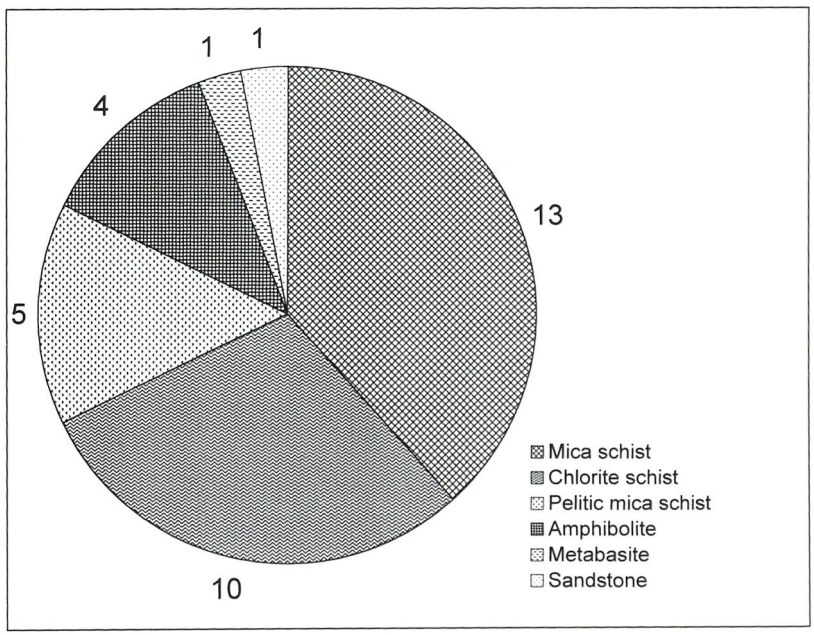

Fig. 3b: Rock types from 34 Medieval carved stones at Oronsay.

The instrument is the size of a large torch, 187 mm (without pin) in length, 65 mm in diameter and weighs 0.35 kg (including battery). The KT-9 has a sensitivity of 1×10^{5} SI units. The operating range is from 1×10^{5} to 999×10^{3} SI units and is powered by a 3V battery. It gives a digital readout of susceptibility in non-dimensional SI units factored by 10^{-3}. A unique feature of the KT–9 is the pin that protrudes from the centre of the machines front face. This enables the user to take a reading from an extremely small portion of the sample's surface. The KT-9 will, with successive readings on an uneven surface, remove any 'unevenness' error, and a very accurate result will be obtained.

The KT-9 uses an air-cored measuring coil which has a much greater degree of sample 'penetration' when compared with an instrument using a ferrite core where only 2–3 mm is achieved. The KT-9 receives 90% of its signal from the first 20 mm of sample.

The KT-9 has several operating modes but to achieve a consistency of readings the "pin mode" of working was used throughout. The KT-9 handbook recommends that the "Pin Mode" is used "for all measurements where an uneven surface and weathering are present – effectively all field samples." The "No Pin Mode" is recommended "for all drillcore measurements, cut or polished rock samples or for relatively smooth rock faces (if weathering is not a problem)". *User's Guide KT-9 Kappameter Revision 1. Exploranium Radiation detection systems. August 1997.*

The accuracy on a flat rock is estimated to be ±3% in the "pin mode" and ±1% in the "no pin mode". *User's Guide KT-9 Kappameter Revision 1. Exploranium Radiation detection systems. August 1997, p. 74.* However, for the above mentioned reasons the "pin mode" allows a much better match to be made between weathered uneven surfaces of natural rock in the field and the weathered faces of the carved stones and has been used for all the magnetic susceptibility readings in this study.

Whenever feasible a series of a dozen readings were taken from the front of graveslabs and all faces of upstanding crosses and carved stones away from all possible sources of magnetic contamination (see section 2.2.4). Twelve readings represent one data set. Over 180 individual data sets were collected and were initially logged into a Psion 3a palmtop computer where the average and standard deviation of each set of readings were determined. From all the non-contaminated data, a representative value was chosen for each stone and then plotted in Excel 97. Approximately 25 data sets taken previously, mainly from quarry or outcrop locations, were also utilised to provide a broader database for the current project.

3.2.3 Effect of weathering

It is important to match weathered carved stone faces with weathered natural outcrop as very fresh faces from outcrops will give a different reading. The effects of weathering on magnetic susceptibility readings from the differently orientated faces of a standing stone can easily be detected. The variability of data from different faces of stones must be in part due to the effect of differential weathering brought about by temperature, wind and water. Another factor to be considered, especially in sedimentary rocks, is the natural differential weathering between the face and edge of a stone.

3.2.4 Contamination of data

Magnetic contamination of the readings was noted on some of the sculptures. It can be broken down into three sources, namely method of mounting, repairs to the stones and the composition of surfaces on which the sculptures are lying.

The metal pins or metal clamps holding the stones upright, or the shelves on which the objects are located, can have an effect on the measurements. Readings can be low, negative or higher than usual. The various faces of a stone can show readings on entirely different scales. This may be a result of weathering effects, fixings, structure of rock etc. or even a combination of these factors.

Metal fixings would alter the readings and so all readings were taken as far away as possible from any metal. Fresh and weathered surfaces do give slightly different results and the preferred surface would be a slightly weathered one as it allowed more accurate matching with weathered faces in other grave slabs as well as quarry faces. Generally the face of the gravestone would represent the natural face of the rock and readings from the true face, rather than the edge have been used throughout.

At all locations, stones with a thickness less

than 6 cm were treated as suspect as no tables for adjusting the readings from thin rock units have been made (Williams-Thorpe et al., 2000). As all the measurements have been taken with the same instrument, there is a good degree of comparison between data without any inter-instrument effects.

3.3 X-ray Fluorescence Spectroscopy

XRF analysis of the rocks from possible quarry sites was undertaken. This geochemical data was used to corroborate the findings of the petrology.

4. Summary of the geology of the West Highlands

The West Highlands of Scotland are characterised by an enormous variety of rock types that are found in the catchment area of the Lord of the Isles. The geology includes Lewisian gneiss, Torridonian sedimentary rocks, a variety of younger intrusive and extrusive igneous rocks and metamorphosed sedimentary and igneous rocks.

The geology of Iona and Oronsay is more restricted but none the less does show a variety of rock types.

Iona comprises mainly rocks of Lewisian age – gneiss, marble and hornblende schist with minor younger intrusive igneous rocks. Sedimentary rocks (conglomerate, grit and shale) of Torridonian age also crop out on Iona.

Oronsay has much more restricted geology – principally sedimentary rocks of Torridonian age (conglomerate, grit, sandstone and shale). The geology of its close neighbour, Colonsay, is similar although more shale and minor igneous rocks (augite diorite and lamprophyre) do crop out on this island.

However, the Lordship of the Isles and Earldom of Ross covered a considerable area of the West Highlands (fig. 1). The rock types used for the sculptures can all be sourced within this area.

Results

Based on the examinations carried out there are a significant number of macroscopic diffe-rences in the stone types used for the sculptures at all of the sites examined. An attempt has been made

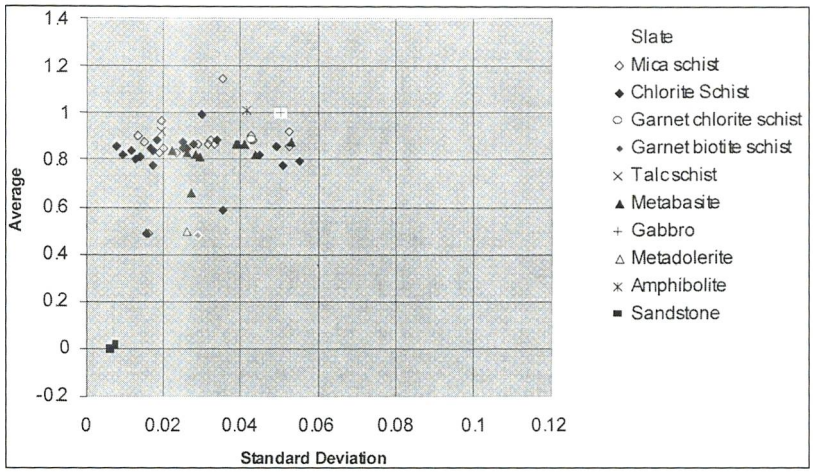

Fig. 4a: Magnetic Susceptibility of identified rock types fraom Medieval Carved Stones at Iona.

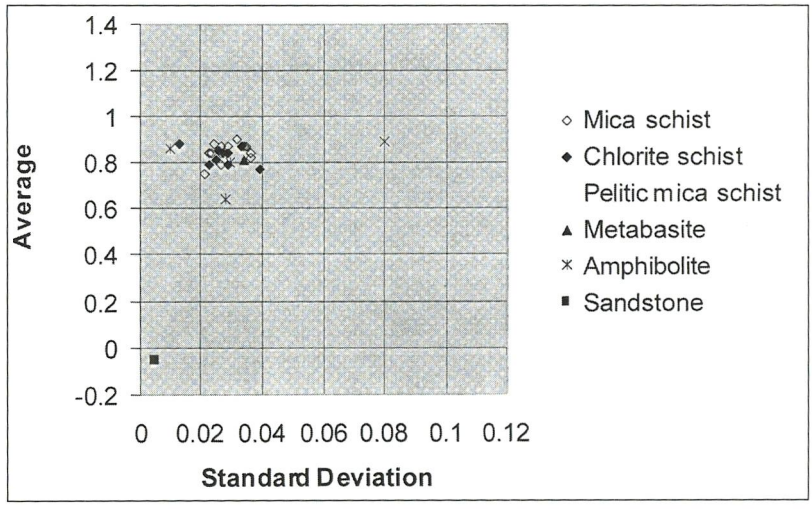

Fig. 4b: Magnetic Susceptibility of identified rock types fraom Medieval Carved Stones at Oronsay.

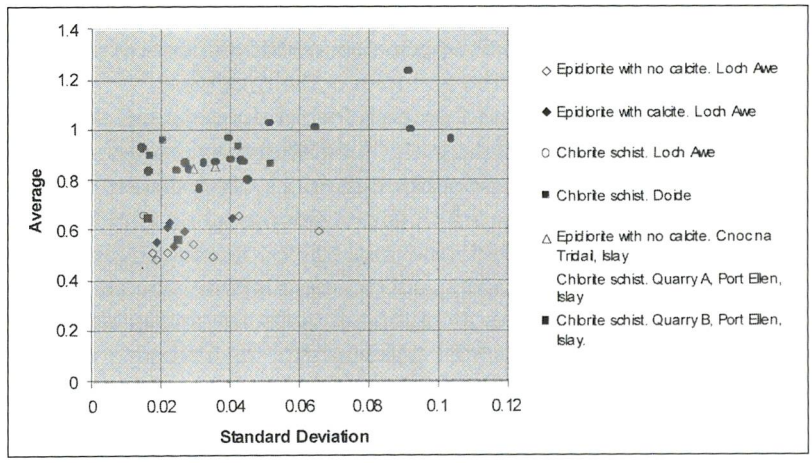

Fig. 5: Magnetic Susceptibility data from selected siteswith XRF data on the West Coast of Scotland. Multiple readings from some outcrops.

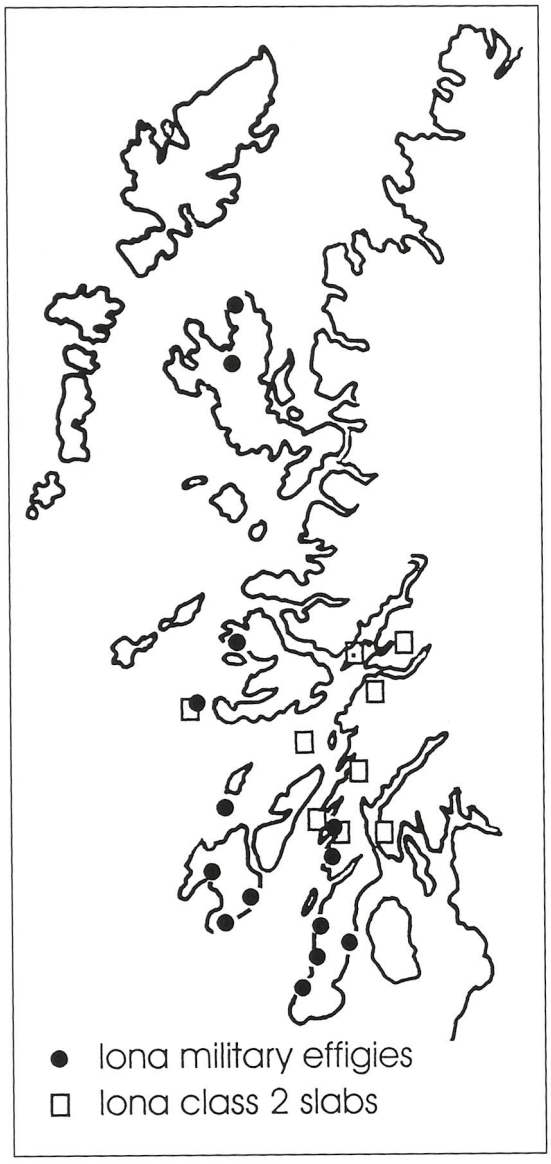

Fig. 6: Locations of class II grave slabs and military effigies in the West Highlands.

to characterise the general groupings based on petrology and magnetic susceptibility.

All petrological analysis was undertaken independently of the magnetic susceptibility measurements to ensure that no bias was recorded in the grouping of the rock types.

Based on petrological examination, the rocks used for the Iona sculptures include slate, a number of varieties of schist (mica schist, chlorite schist, garnet chlorite schist, garnet biotite schist and talc schist), metabasite, trachyte/dacite, gabbro, metadolerite, metagranodiorite, amphibolite, sandstone and quartzite.

The rock types used for the Oronsay sculptures is more restricted and includes mica and chlorite schist, pelitic mica schist, metabasite, amphibolite and sandstone.

On both Iona and Oronsay the most commonly used rock type is schist (fig. 3). The notable difference between Iona and Oronsay is that Iona has a greater variety of schist types with the exception of a distinctive pelitic mica schist that appears only on Oronsay.

The combined magnetic susceptibility data and petrological classifications for Iona and Oronsay sculptures are shown in figure 4. There is a good correlation between different rock types and average magnetic susceptibility measurements. In particular, slate (Iona), metadolerite (Iona), pelitic mica schist (Oronsay), and sandstone and Quartzite (both Iona and Oronsay) have consistently low magnetic susceptibility measurements whilst the other rock types, including all the other varieties of schist, exhibit higher average magnetic susceptibility measurements. Of the Iona carvings in slate, one is non-pyritiferous with a single slaty cleavage whilst the others are pyrite-bearing with at least two discernable cleavages. The two slate types also show distinct magnetic susceptibility measurements.

The rock types used for sculptures on both Iona and Oronsay cannot be locally derived. In addition, they cannot have a single source location since the range of rock types used indicates that a number of quarry localities must have been utilised. This is clear from the petrology (when compared to the local geology). However, all of the rock types identified could have been sourced within the West Highlands. Steer and Bannerman (1977, 195–200) suggested a possible source for many of the Iona sculptures as Doide "quarry" on the Kintyre peninsula. It is clear that comparing both the petrological and magnetic susceptibility data of the carved stones with that of rock from Doide quarry (fig. 5), this site may have been a source of some of the sculptured stones. However, it could not have been the source of all material for the sculptures examined.

Conclusions

Initial conclusions are that there are many more sources of stone used by medieval sculptors in the West Highlands than hitherto postulated, and there may not be a neat match between these sources and Steer and Bannerman's schools. Although a detailed reassessment of Steer and Bannerman's stylistic analysis has yet to be made, these points alone suggest that their model of five schools may need

revision. In any case, is it credible, as in their scheme, that the carvers, particularly on Iona and Oronsay and in Kintyre, imported blocks of stone over long distances for their work? There would presumably have been a significant amount of wastage in the process of shaping and carving the slabs and crosses, best left at the quarry itself. Stone is heavy and expensive to transport. Most craftsmen would surely have wished to have been closely involved with selecting the actual slabs they were going to carve. It therefore seems much more likely to the writers that the carvers would be based at the quarries and that long sea voyages would have been the exception rather than the rule. Work by scholars in England on other medieval grave slabs and covers suggests that such a picture would be the norm (Butler 1958; Butler 1964). Further research may reveal a more complex picture of individual craftsmen or workshops based at several quarries, or indeed opening up quarries from time to time to deal with local commissions.

A study by Caldwell and Ruckley (forthcoming) of medieval architecture in the Lordship of the Isles suggests that there were two main regions in the 14th and 15th century characterised by different types of masonry. One encompasses the area from the Island of Mull northwards, the other includes Islay, Kintyre and Knapdale. Builders in the latter area showed themselves to be adept in rough dressing metamorphic and igneous rocks for quoins, lintels, sills and jambs. At Oronsay Priory they even used chlorite and mica schist slabs for piers and gableheads in a re-modelling of the cloister arcade in the early 16th century. This work (Oronsay School?) is signed by Mael-Sechlainn O'Cuinn, who also made a nearby commemorative cross, described as Iona School, late 15th century. It was probably the same man who made the Iona School effigy at Iona described above (fig. 2d), and possibly also the slab with the harp at Keills (fig. 2c) assigned to the Loch Sween School.

There was indeed a preference for chlorite or mica schist, perhaps reflecting the regions in which most carvers operated, traditional quarrying and masonry practices. If we discard the assumption that there was one dominant Iona School based on that island, other trends can be seen to emerge. Here we will only consider the Iona School class II slabs (fig. 2a) and the effigies of men in armour (fig. 2d).

Fifteen out of a total of 28 class II slabs are on Iona. One is on the Garvellach Islands. Two are at the cathedral of Argyll on the Island of Lismore and the rest are on the mainland of Argyll (fig. 6). Apart from Iona and the Garvellachs these are in areas which were not within the Lordship of the Isles but were controlled, or under the influence of the Campbells, by the end of the 15th century. Their distribution coincides reasonably well with sculpture of the Loch Awe School and it seems probable that both groups represent the culture and society of people outwith the Lordship. RCAHMS (1982, 228) ascribe two graveslabs at Iona to the Loch Awe School, which, together with the class II slabs there, must represent those individuals from Loch Awe, Lorn and Knapdale who aspired to be buried in this most holy of places, the home of St Columba. The few Loch Awe slabs in MacDonald territory in Kintyre and on Islay may reflect in some way the alliance of the MacDonalds of Clan Donald South with the Campbells in the 16th century after the forfeiture of the Lordship of the Isles in 1493.

Apart from 2 on Skye there are 5 Iona School effigies of men in armour on Iona, 2 on Oronsay, 4 on Islay, 8 in Kintyre, and 2 at Kilmory on Loch Sween – all part of the Lordship of the Isles, and with the exception of Iona, all territory held by branches of Clan Donald (fig. 6). Perhaps most of them commemorate gentlemen of that clan and its close confederates. If the carvers worked at quarries on Clan Donald lands other clan leaders may not have been inclined to identify themselves with their products.

There is clearly much more research to be done on West Highland sculpture – more petrological and chemical analyses, the identification of additional quarry sources, and a complete reassessment of the stylistic characteristics of the carvings. We hope that this preliminary report will demonstrate the scope there is for redefining the nature of the culture and society of the Lordship of the Isles and the neighbouring areas.

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