Did the North Atlantic region constitute a market for quernstones from Norway during the Viking Age and the Middle Ages?

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In the Viking Age and the Middle Ages there was a close connection between people from the North Atlantic region and Norway, which is reflected in both written and archaeological evidence. The aim of this paper is to investigate whether this contact also included trade of quernstones from Norway. Did the North Atlantic region constitute a market for Norwegian quernstones? Geological studies have been conducted on quernstone assemblages in Shetland, Iceland and the Faroe Islands dating to the Viking Age and the Middle Ages. The results indicate that Shetland seems to have been self-sufficient with quernstones, whereas quernstones from the quarries in Hyllestad in the county of Sogn og Fjordane in Norway were distributed to Iceland and the Faroe Islands. However, the finds are few and Hyllestad does not stand out as a dominant supplier. During the Viking Age, quernstones from Hyllestad were only exceptionally distributed westwards, most likely as personal belongings of travelling people. In the Middle Ages, Iceland and the Faroe Islands became more integrated in the quernstone trade, most likely because of their close contact with Bergen. The trade of quernstones from Hyllestad was in all likelihood largely organised via Bergen, along with a variety of other commodities.

Keywords: quernstone, millstone, quarry, Hyllestad, Shetland, Iceland, the Faroe Islands, Viking Age, Middle Ages

During the Viking Age (c. 800–1050) and the Middle Ages (c. 1050–1500), there was a close connection between people from the North Atlantic region and Western Norway. Iceland, Shetland and the Faroe Islands were to a large degree settled by Vikings from Norway; for both the Faroe Islands and Iceland, the colonisation from Norway seems largely to have taken place from the western parts of Norway – even though settlers from Northern Norway also are indicated in both written and archaeological sources (Landnámabók, Arge 1989:106, Mortensen et al. 2012:59–62) (Fig. 1) – and contact with the Norwegians was maintained throughout the following centuries. The somewhat short sea journey between the North Atlantic Islands and Western Norway, also made a close connection possible and, during the Middle Ages, large amounts of commodities were transported between the areas (Øye 2008:243).

Is this development then also to be reflected in the quernstone material? Were quernstones from Norway distributed to the North Atlantic Islands – and if so – was it an organised commercial trade, or was it perhaps an exchange where the products passed from hand to hand through a network of personal contacts? In order to look into Norway’s role as a potential supplier of quernstones to the North Atlantic region, provenance studies of quernstones in Iceland, Shetland and the Faroe Islands have been conducted.

Garnet-mica schist for quern and millstones – a Norwegian speciality?

In Norway, the rotary quern was introduced in the first centuries AD. A large collection of quernstones dated...
to the Iron Age from Rogaland in Southwest Norway are almost exclusively made from erratic boulders of local origin, mainly gneiss (Hauken & Anderson submitted). Quernstones made of slabs or flat blocks of gneiss and schist are also common at different sites from the Iron Age and into the Middle Ages. Some of these slabs may have been quarried by wedging, but no quarry has been found so far, and the majority were probably made from loose blocks found near the farms where they were used.

From the Viking Age onwards a change in the production of quernstones is documented. From this period on, quernstones were mainly extracted from quarries, and several quernstone quarries are located in Norway. Through detailed studies of the mineralogical, textural and structural features of the rocks at the sites, a record of the characteristic features for each quarry has been obtained. Thin sections and chemical analyses of each quarry are also available, and both are useful – and in some cases necessary tools for identification. In most cases, however, a geologist with experience from

Fig. 1. Map of the North Atlantic region. Drawing: Eva Bjørseth, Department of Earth Science, University of Bergen.

Fig. 2. Rotary quern of staurolite gneiss, Shetland Museum. The staurolite crystals can be seen on the grinding surface of the lower stone. Diameter 34 and 35 cm. Photo: Øystein James Jansen.
Norwegian quernstone quarries is able to recognise the provenance of the majority of Norwegian quernstones based on macroscopic criteria observed using a hand lens or stereo microscope. The rock type in all of the main quarrying areas that emerged throughout the Viking Age and the Middle Ages was based on garnet-mica schist, a metamorphic rock quite common in Norway (www.millstone.no).

The utilisation of this type of stone has formed a belief in Norway that the use of garnet-mica schist was a unique Norwegian specialty. In recent years, however, more focus and research on quern and millstones has brought information about garnet-mica schist quarries outside of Norway. Lisowska et al. (this volume) reports a quarry in garnet-mica schist in Kmieciec Zabkowicki, Poland, situated close to settlements from the ninth and tenth centuries. Roddy Mainland (Mainland 2012), a Scottish amateur historian, reports a garnet-mica schist quarry of unknown age at Glen Roy in western Scotland. Finds of quernstones of garnet-mica schist in Scotland have been reported in archaeological journals (Campbell 1987, MacKie 1972). Campbell (1987) suggested an early age, late sixth to early ninth centuries AD, for two “very well made” querns of “quartz-garnet-mica-chlorite schist”. MacKie (1972) describes a quarter of a garnet-mica schist hand quern found in the remnants of walls of a dun dated to the first or second centuries AD. Thus, the production of quern and millstones of garnet-mica schist is not unique to Norway.

Several of the quernstone quarries in Norway indicate a large-scale production aimed at larger markets. Were the North Atlantic Islands central markets for the Norwegian quernstones?

Shetland

Vikings seem to have settled in Shetland in the early 800s (Curle 1954), and Shetland remained under Norwegian control until the 1460s, when it was transferred to Scotland (Helle 1982:804). The close connection to Norway is documented through written sources (Smith 2002), but also through archaeological evidence. For instance, soapstone objects from Norway have been found in large quantities from the Viking Age onwards, e.g. at the Norse farmstead Jarlshof (Forster 2009:58–65). In addition, quernstones of garnet-mica schist are documented in several Norse settlements, such as Da Biggins in Papa Stour and Sandwick in Unst (Baug & Jansen in prep. a), and an obvious question would be if the quernstones from these sites could have a Norwegian origin.

The geological setting of Shetland is quite different from Iceland and the Faroe Islands, both consisting almost entirely of volcanic rocks. A major part of Shetland consists of metamorphic rocks; gneiss and schist – including garnet-mica schist, and the geology is in general similar to Norway.

The collections of quernstones at the Shetland Museum

Fifteen specimens were examined in Shetland. Eight were complete quernstones and the rest were fragments between ⅓ and ¼ of a complete stone. The composition of the stones was examined macroscopically by hand lens, and the conclusion was that none of the stones came from any of the Norwegian quarries (Baug & Jansen in prep. a).

The majority of the quernstones studied were made of metamorphic rocks, i.e. staurolite-bearing schistose gneiss (Fig. 2) and a couple of garnet-mica schist, rock types that are common in Shetland (Trewin 2002). Three quernstones are made of conglomerate, a type that occurs in the Devonian sediments in the southern part of Shetland. All of the quernstones in the collections at Shetland Museum then seem to be of local origin (Fig. 3). We also found quernstones and millstones without context, some located in private gardens (Fig. 4) and a couple at the harbour in Lerwick. These stones were made of schistose gneiss, mica schist and sandstone.

Fig. 3. Geological classification of the quernstone collection at the Shetland Museum. The number of stones of each type is recorded on the vertical axis.
- gr-mica sch=garnet-mica schist
- gneiss sch=schistose gneiss, often containing staurolite and occasionally garnet
- gneiss mas=massive gneiss
- conglomerate
The knowledge about the quernstones in Shetland is summed up by D. Gordon Tucker in his paper “Millstone making in Scotland” (Tucker 1984). Tucker lists twenty-six quarries but only two of them are located in Shetland, at Yell and West Burrafirth (Fig. 5). However, the only information about these quarries is that “garnetiferous schists were used for millstones in both places”. Tucker is quoting this information from MacGregor (1940), and also quoting Hibbert (1822) who described the Shetland millstones as “commonly formed of micaceous gneiss”. His own conclusions (based on pictures of 50 Shetland millstones offered him by collectors) are that several kinds of rock are used, “from sandstone to a sort of highly micaceous granite with small red pebbles – presumably the garnetiferous schist reported by MacGregor”. The diameter of these stones varies from 0.68 to 0.91 m, with a typical thickness of 0.13 m – and were used in the typical Norse watermill.

After finishing our studies of the museum collections, we spent a few days searching for the quernstone quarries. Proper rocks of the same type as the majority of the quernstones at Shetland Museum were identified, i.e. staurolite gneiss and garnet-mica schist. The quarries were, however, more difficult to find. This was mainly due to a lack of proper information about the location of the quarries we were searching for, but also the short time available. Only two quarries were identified.

One quarry was found in Weisdale, about 10 miles northwest of Lerwick (cf. Fig. 5), situated in a zone of staurolite-bearing gneiss and mica schist belonging to the Precambrian Dalradian Supergroup (Trewin 2002). After hours of searching the grassy hills, we managed to find a small, unregistered quarry (Fig. 6). In this quarry, millstones had been produced from slabs of schistose gneiss containing porphyroclasts of retrograded staurolite – probably muscovite aggregates. A few discarded millstones and a small amount of waste was all that was left. The diameter of the discarded stones measured between 66 and 80 cm, obviously stones for water mills. In the surrounding area along the ridge, traces of extraction of slabs by wedging were also found on small outcrops.

A possible quern or millstone quarry was found further north, at the island of Yell, situated in a schistose garnet-bearing gneiss of the Moine Supergroup (Trewin 2002). This quarry is bigger than the first one (Fig. 7) and may be the one mentioned by Tucker (1984) citing McGregor (1940). No proper evidence of quern or millstone production was found, but it was most likely a quarry of old age, with a waste pile containing garnet gneiss of good millstone quality.

An important reason for our unsuccessful search for quarries may well be that the quarries were small and quarried far back in time, and later overgrown.
and covered by vegetation. The local extraction was obviously sufficient and, despite the close contact between Shetland and Norway since Viking times, there are no indications in the archaeological record that an import of quernstones from Norway took place.

Iceland

Iceland is, in geological sense, a young island, formed by volcanic activity over the last 15–16 million years. Metamorphic rocks, like garnet-mica schist are not present in the bedrock, and any artefact found of this rock type must have been imported.

Quern- and millstones of the garnet mica-schist type have been found at six sites in Iceland, altogether 30 finds. Macroscopic investigations by stereo microscope of the mineral composition, texture and structure, show that nearly all the stones studied come from the quarries in Hyllestad, in the county of Sogn og Fjordane. Two hand querns and two water millstones found in Akureyri, in northern Iceland, were produced in Selbu, in the county of Sør-Trøndelag, Norway. These stones are of a more recent date, and all quernstones of garnet-mica schist with a possible date to the late Viking Age and the Middle Ages were produced in Hyllestad (Baug & Jansen in prep. b).

The Hyllestad schist

The quarries in Hyllestad are located by the Åfjorden fjord, north of the outlet of the Sognefjord fjord, on the west coast of Norway. The garnet-mica schist from the Hyllestad quarries is rather special compared to the schist from the other Norwegian quarries and, for a trained geologist, it is normally the easiest one to identify macroscopically. A unique feature of the Hyllestad schist is the occurrence of kyanite, a bluish (or sometimes greyish) mineral that appears as elongated crystals up to 2 cm long (Fig. 8). In Norway, kyanite is only found in quernstones from Hyllestad. (Carelli & Kresten 1997, Baug 2002). Unfortunately, some stones from Hyllestad do not carry kyanite, but the following criteria are most often sufficient for a positive identification: 1) The white mica (muscovite) occurs in coarse-grained aggregates, giving a shell-like, silvery appearance. 2) The garnets are dark red with a brownish tint, ranging in size from 2 to 8 mm. 3) The garnet crystals are most often rounded, sometimes cracked and commonly partly retrograded to chlorite; this is due to a late low-grade metamorphic shearing (Fig. 9) that also produced typical shear bands, which cut obliquely through the main schistosity (Fig. 10). 4) Minor amounts of staurolite and retrograde

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1 Quern- and millstones located at the National Museum of Iceland, as well as at the Akureyri Museum were studied in 2010. Quernstones excavated more recently may be located with different excavation companies, but due to the limited time and financing for this project, these finds could not be investigated.
chloritoid are also common (seen through a hand lens as small, black grains embayed in a light grey mica matrix).

5) Amphibole may occur, but the dark mica biotite that is common in most other Norwegian quarries is not reported in the Hyllestad schist (Grenne et al. 2008). The coarse grain size of the muscovite, the special appearance features of the garnets, the shear bands and the lack of staurolite and biotite is normally enough to identify the Hyllestad stone and sort it out from the other Norwegian garnet-mica schists – even without the appearance of kyanite.

For a few of the stones found in Iceland, no information with regard to context and date could be retrieved. The quernstones of mica schist constitute about one fourth (26 quernstones) of all the quernstones found, whereas the rest are made of basalt, probably locally produced in Iceland. The stones seem to have been used a lot, until they were worn thin, and the quernstone material from Hyllestad is thus very fragmented. The exception is the well-worn, but still intact and beautiful, lower stone on display at the National Museum of Iceland, unfortunately from an unknown context (Fig. 11). Forty
specimens of quernstone fragments from the museum stores were studied. They ranged mostly from 30 to 10 cm, but some pieces were even smaller (Fig. 12). Some of the fragments may belong to the same quernstone, and the representation of Hyllestad stones may thus be substantially lower than the number of fragments would indicate. The mineral kyanite was only found in two of the investigated specimens. The small size of the fragments may partly explain the rare occurrence of kyanite, a diagnostic but not always a particularly abundant mineral in the Hyllestad schist.

Most of the quernstones (17 quernstones) were found at Stóraborg, a farm mound dated from the twelfth to the nineteenth century in the southeastern part of Iceland (Colic & Snæsdóttir 2010:1, 3). Five of the quernstones studied (including a small toy quernstone of soapstone) were found at the landnám farm Bergþórshvoll, the home of Njál þorgeirsson, mentioned in one of the Icelandic sagas, the Njál saga. The farm has, however, been settled up until today (Eldjárn & Gestsson 1951:5–6, 12–13), complicating dating of the quernstones (Baug & Jansen in prep. b).

The Faroe Islands

The bedrock of the Faroe Islands is, apart from some subordinate sediment layers, composed of volcanic rocks formed by eruptions 60–70 million years ago (Fig. 13). Metamorphic rocks, like schist and gneiss, are not present in the bedrock, and quernstones made of such rocks must be imported.

The quernstones investigated at the National Museum of Faroe Islands counted 43 specimens; only 8 stones were complete, 20 of the quernstones were large fragments with half the stone or a quarter of the stone left, while 15 fragments consisted of smaller pieces (2–20 cm). The rock types were examined by hand lens to determine the mineral composition, texture and structure. The result is shown in figure 14.
Quernstones of Hyllestad provenance

Four quernstones were identified to be of Hyllestad origin (Fig. 15), three of them displaying the irrefutable evidence, kyanite. Three more stones of garnet-mica schist were regarded as “probably Hyllestad”. A deviation from the normal size of garnet (2–8 mm) for two of the stones, and a minor content of biotite for the third was the main reason for not including them as proper Hyllestad stones. We must add that if these stones had been found in Norway, they would have been considered to be within the limits of Hyllestad stones, since all the other Hyllestad criteria were fulfilled. However, as many of the millstones in the Faroe Islands collections are not of Norwegian provenance it is necessary to exercise more care. Especially since the knowledge about the millstone quarries and its rocks in nearby Scotland and Shetland is very limited.

The four quernstones that definitely originated in Hyllestad were found at Durhusi in Eiði and in Skarvanes, both dating to the Middle Ages, and two stray finds that may stem from the early modern period. The three stones that most likely stem from Hyllestad were found near the old churchyard in Sandur at Sandøy and dated to the late Viking Age, at the churchyard in Sumba dated to the late Middle Ages and a stray find possibly from the early modern period (Baug & Jansen in prep. c). Thus, only one possible quernstone from Hyllestad dates to the Viking Age – the rest are from the Middle Ages and the early modern period.

Quernstones of other provenance in the Faroe Islands

As shown in figure 14 the quernstones found in the Faroe Islands are of a quite varying composition and, apart from two stones of possible local origin (basalt/microgabbro and conglomerate/agglomerate), they are all imported. It is beyond the scope of our task to find the provenance of these quernstones, but we would like to draw attention to the ten stones found in a settlement from the Viking Age at Toftanes, Lørvik. Four of the stones consist of dark, fine-grained biotite schist, containing staurolite and garnet. The composition and structure are similar to the well-known high quality millstones from Selbu in Norway (Fig. 16). The fact that the stones are found in a Viking Age context does, however, exclude Selbu as the source, since the earliest quarrying so far documented is based on written documents from the 1600s (Friis 1632:97).

The other quernstones found in the same settlement are made of garnet gneiss (2 quernstones), garnet-muscovite-biotite schist (2 quernstones) and granitic, igneous rock (2 quernstones). Their geological characteristics do not match with any of the Norwegian quarries and Scotland and Shetland are the most likely candidates, also for the staurolite schist (Baug & Jansen in prep. c).
Was there a quernstone trade from Hyllestad to Iceland and the Faroe Islands?

In Hyllestad, a large-scale production of quernstones took place during the Viking Age and the Middle Ages, and the production provided a surplus for exchange and trade. The earliest extraction dates to the early Viking Age, approximately AD 800s (Baug 2002:50–51, 57–58), but a wide-ranging distribution of the stones does not seem to have taken place prior to the latter half of the tenth century (Carelli & Kresten 1997:121, Baug 2013:303–304). From the end of the Viking Age, then, and throughout the Middle Ages, the quernstone quarries in Hyllestad clearly signify links with long-distance trade systems. Hyllestad stones are found in large quantities all over the territory of medieval Denmark, but seem to be concentrated to the eastern parts of the country, i.e. Northern Jutland and on the islands, and towards the Baltic Sea, with large quantities found in Scania and Bornholm (Carelli & Kresten 1997, Sindbæk 2004:148–150, Baug 2013:227–235).

Even though several quernstone quarries are known in Norway from the Viking Age and the Middle Ages, Hyllestad is the only quarry site that exported quernstones to the North Atlantic region during this period. In southern Sweden and north-eastern Denmark, quernstones from Hyllestad clearly dominate the market, even though stones with different origin also have been found, complicating the picture (Carelli & Kresten 1997; Baug 2013:228–231). The presence of quernstones in urban environments and market places in southern Sweden and eastern Denmark indicates an organised and commercial trade. But do the quernstones in Iceland and the Faroe Islands also represent traded commodities?

It is, of course, difficult to identify forms of transaction for the quernstones from the archaeological evidence alone. The objects found in the North Atlantic region reflect some form of contact, but the spread of quernstones cannot always be understood in terms of trade. The scarcity of quernstones from Hyllestad dated to the Viking Age in these societies suggests that these finds represent personal belongings, most likely brought there by travellers or perhaps even settlers. According to written sources (the Landnámabók recorded in the twelfth century), the Norwegian colonisation of Iceland took place in the decades between 870 and 930. The written evidence also indicates that Iceland largely was settled by people from Norway – many from the western part of the country (see e.g. Mortensen et al. 2012:58–62). Yet, it is striking that, except for Bergþórsvoll, none of the landnám farms in Iceland seem to have quernstones from Hyllestad (see e.g. Gestsson 1959:71–72, Magnússon 1971:68, 72–74).

Recent research indicate that the landnám in the Faroe Islands may have started already in the fifth–sixth centuries, some 300–500 years before the large scale colonisation by the Vikings. However, the finds from this first colonisation are minor compared to the large scale Viking colonisation of the 800s (Church et al. 2013). During the 800–900s, the settlers came from Norway, but most likely also from the Norse settlements in the British Isles. This is documented through written sources, such as the Færeyinga saga, in place names, in the language, as well as through genetic studies (Mortensen et al. 2012:56–58). Only one quernstone possibly from Hyllestad has been dated to the Viking Age (Baug & Jansen in prep. c). Thus, quernstones from Hyllestad were not commonly exported nor brought over to Iceland and the Faroe Islands this early. A study of Norwegian soapstone vessels in the North Atlantic region indicates the same situation as for quernstones. The relatively low number of these goods in this region does not support the idea of an organised export from Norway in the Viking Age (Forster 2004:351, 360, 2009:61). The presence of Norwegian stone products could represent personal possessions brought there by moving populations rather than being commodities within a commercial trade.

The character of the distribution to the North Atlantic islands seems to have changed during the Middle Ages, as the North Atlantic islands became more integrated into medieval trade, perhaps because of their close contact with Bergen. In the Middle Ages, people from the North Atlantic region had a close political-administrative and economic connection to Norway (see e.g. Arge 1989, Crawford 2002, Øye 2008). Medieval Bergen was the most important town in Norway, and from the middle of the twelfth century onwards, it was known as the largest trading centre in the country (Helle 1982:167). From the 1200s, Bergen was also a cultural, economic and legal junction for the North Atlantic islands, which were subjected to the fehird2 in Bergen from the beginning of the 1300s, meaning that taxes were paid to the Norwegian Crown (Helle 1982:173–174, 331). A large variety of products from far and near was brought to the town, also

2 In the Middle Ages the King’s income was paid in commodities and money to a regional fehird. In the 14th century the fehirdsle in Bergen was the largest one in the country – and also included the islands in the North Atlantic (Helle 1982:331).
quern- and millstones, which most likely should be seen as remains from trading activities (Baug 2002:78, 2013:215–220, 317–322). Evidence that Bergen was an important part of the quernstone industry can also be found in the medieval Urban Code of Bergen from 1276, which states that quernstones should be sold from the western side of the Vågen Bay, Stranden, and not from Bryggen (Bl VI:8).

From the 1100s onwards, people from the North Atlantic region travelled to Bergen in order to buy and sell goods. For instance, wool and fish were brought to Bergen and sold here. In Bergen, a variety of objects were acquired and brought back to the North Atlantic islands – most likely also quernstones. Most trade was, however, conducted by Norwegian traders and ecclesiastical institutions in Bergen, sending several ships westwards every year with Norwegian commodities. According to recorded evidence, the Norwegian Crown promised in 1262 to send six ships every year to Iceland with commodities from Norway and in 1271 a promise of two ships annually was made to the Faroe Islands (Helle 1982:165, 360–364). Most likely, also quernstones were brought westwards on these ships. There are, however, no indications that larger cargoes with quernstones from Norway were transported westwards. The medieval trade was largely organised via Bergen, along with a variety of other commodities.

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References


AmS-Skrifter 24

North Atlantic region a market for quernstones from Norway during the Viking Age and the Middle Ages?


Lisowska, E., Gunia, P. & Borowski, M. this volume. Production and distribution of rotary quernstones from quarries in southwestern Poland in the early Middle Ages.


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