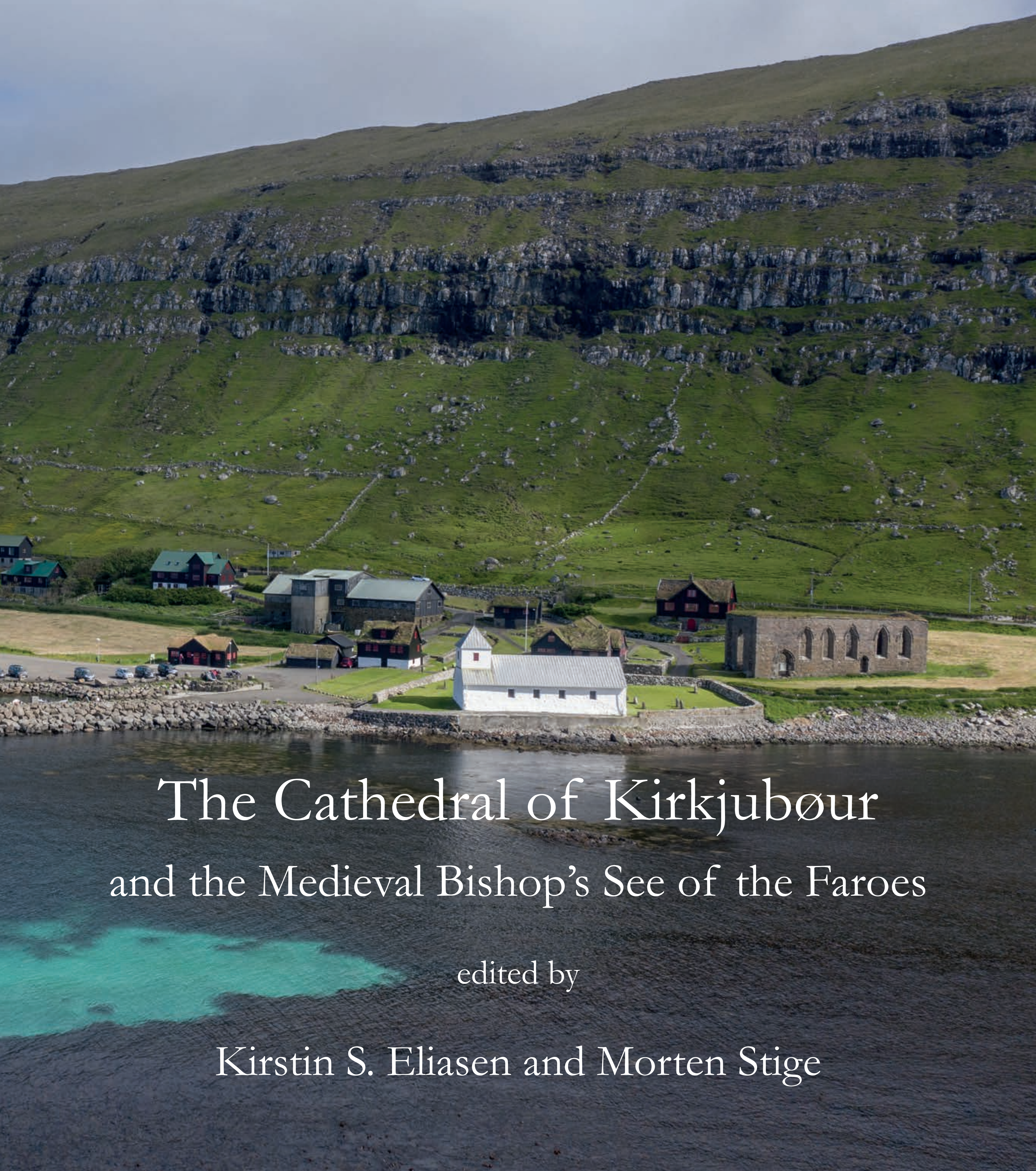

The Cathedral of Kirkjubøur

and the Medieval Bishop's See of the Faroes

edited by

Kirstin S. Eliasen and Morten Stige

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TJÓÐSAVNIÐ

Tórshavn 2024

The Cathedral of Kirkjubøur and the Medieval Bishop's See of the Faroes
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Front-cover: Kirkjubøur seen from the south. Photo Ólavur Frederiksen 2020
Back-cover: Consecration crosses. Drawing by L. Koefoed-Jensen 1905

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PREFACE

In 2011, a so-called "pondering meeting" was organised about the archaeological monuments at the Bishop's See in Kirkjubøur. The initiative for this event was taken by the late Símun V. Arge and the Norwegian art historian Morten Stige who together organized the first meeting of this kind in the Faroe Islands. The concept for this type of meeting originated in Norway, where a few years earlier, "pondering seminars" ("grubleseminarium") had been arranged concerning the churches at Tingvoll and Veøy on the west coast of Norway. The approach of such meetings is for participants to prepare for a specific topic. This is followed by a brief, thought-provoking presentation with subsequent discussion and debate. It was a multidisciplinary meeting: the topics covered included not only architecture and conservation issues – which have been particularly focused on in recent years – but also those relating to the cultural-historical significance of the monuments and relics at Kirkjubøur.

In addition to participants from the Faroe Islands, researchers from Norway, Denmark, England, and Scotland were invited. The topics encompassed art history, archaeology, architecture, geology, craftsmanship, decoration, arrangement of church rooms, and comparisons with our neighbouring countries. Besides providing knowledge and inspiration for further work on the Cathedral of Kirkjubøur "Múrurin" and other archaeological sites at Kirkjubøur, it was always intended that the presentations would be turned into articles to be subsequently published in a book. Símun V. Arge and Morten Stige were to lead the editorial work.

This work was somewhat delayed, and for this reason, another "pondering meeting" was held at Kirkjubøur in 2018 to restart the work, and it was decided that the National Museum would publish the book in both English and Faroese.

Unfortunately, Símun passed away suddenly on February 13, 2021, just as the work on the book was getting underway again. After some time had passed, it was decided to continue with the book project, and upon request, Kirstin S. Eliasen agreed to join the editorial team in Símun's place, resulting in this magnificent book. A short obituary of Símun V. Arge written by his colleagues is included after the preface.

"Múrurin" and the archaeological sites at Kirkjubøur are of great public interest in the Faroe Islands. There is not a large amount of literature or other writings that deal with the archaeological sites at Kirkjubøur, and for this reason, the National Museum deemed it necessary to publish the articles. Although the articles are academic, an effort was made to ensure they were written in a manner that is accessible for both laypeople and scholars, and furthermore are richly illustrated.

The title of the book is "The Cathedral of Kirkjubøur and the Medieval Bishop's See of the Faroes" and as the title indicates, the main part concerns matters relating to "Múrurin", but several of the articles also discuss other archaeological sites and buildings such as the church ruin "Líkhús," the Parish Church, and the log house.

The National Museum would like to thank all the authors for their significant contributions. Thanks to the late Símun V. Arge, Morten Stige, and Kirstin S. Eliasen for taking on the task of editing the collection of articles. Morten Stige must also be thanked for keeping the book project going over the years. We especially want to thank Kirstin S. Eliasen for the considerable work of coordinating the project and adjusting the Faroese texts after proofreading. A special thanks also to Mogens Vedsø for graphic design and Sarah E. Thomas for copyediting. Thanks also to Helgi Michelsen and the Archaeology Department of the National Museum for the photographic material, digital work with the images, for map making and for finding and digitizing archaeological material and pictures. Thanks to Sprotin for proofreading, and last but not least, thanks to Betri Support and the National Culture Fund for financial support.

Hoyvík, April 2024
Herleif Hammer
Director, National Museum


Fig. 1. Múrurin under restoration in 2017, seen from the south-west, with the steep, volcanic hills which have a stepped appearance from the erosion of basalt flows in the background. Photo Per Storemyr 2017.

The Stones and Mortars of the Faroese Medieval Cathedral

Per Storemyr and Uni Árting

Introduction

Far away from contemporary European centres of stone architecture, the Faroese medieval cathedral, Múrurin of Kirkjubøur, is an outstanding example of medieval masonry built from local materials. There are none of the 'normal' building stones preferred by medieval masons, like limestone and sandstone, anywhere in the Faroe Islands. The whole archipelago is a basalt province and so the building and decorative stones of the church are all basalt, except for a few sculptural elements made from imported soapstone.[1]

There is, however, a distinct difference between the generally hard, dark basalt of the main rubble

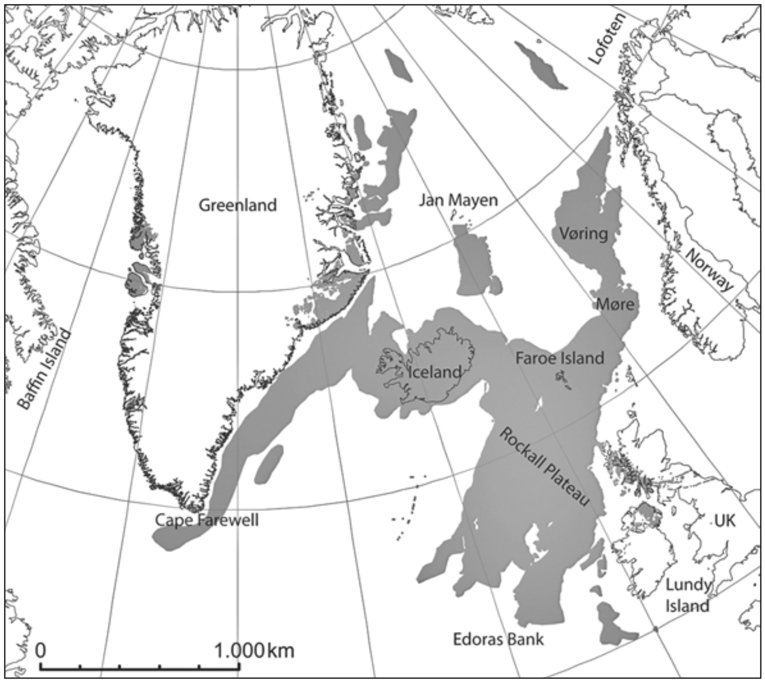

Fig. 2. Schematic map of volcanic sequences within the North Atlantic Igneous Province (NAIP). After Horni et al. 2017.

masonry and the variegated, softer basalts used for carved mouldings and other decoration around the windows, portals and vault ribs.[2] It is likely that this distinction is because the harder basalt is very difficult to work with using medieval stone carvers' tools. This approach is in line with the situation at many medieval churches across Europe, including Norway, outside the Oslo–Hamar region, which has good limestone. Elsewhere, churches in Norway were often built from hard 'granitic' stone and gneiss for rubble masonry and used soft soapstone for carved decoration. Usually, the main building stones were of local origin, which was obviously in order to reduce the cost of transportation, whereas soapstone was shipped from specific quarries located farther away. Put simply, this is a matter of Norwegian geology: there are few deposits that can be used for both large amounts of material for rubble stonework and more easily worked stone for decoration. And, although numerous, the Norwegian soapstone deposits are usually small and so generally had to be reserved for finer carving.[3] The situation is slightly different in Scotland, the Faroe Islands' other "neighbour". Although many Scottish churches were built of hardstone rubble, mainly basalt and granite, the geology of Scotland, including its Western and Northern Isles, is unusually diverse, which implies that many kinds of usable stone only needed to be transported for short distances.[4]

The main hypothesis of this chapter thus mainly draws on the Norwegian situation: Múrurin may well have been built according to the Norwegian strategy of using local rubble for masonry construction and, if not available locally, transporting softer stone for finer carving from further away. This hypothesis also seeks to test previous observations that all the stones at Múrurin are of local

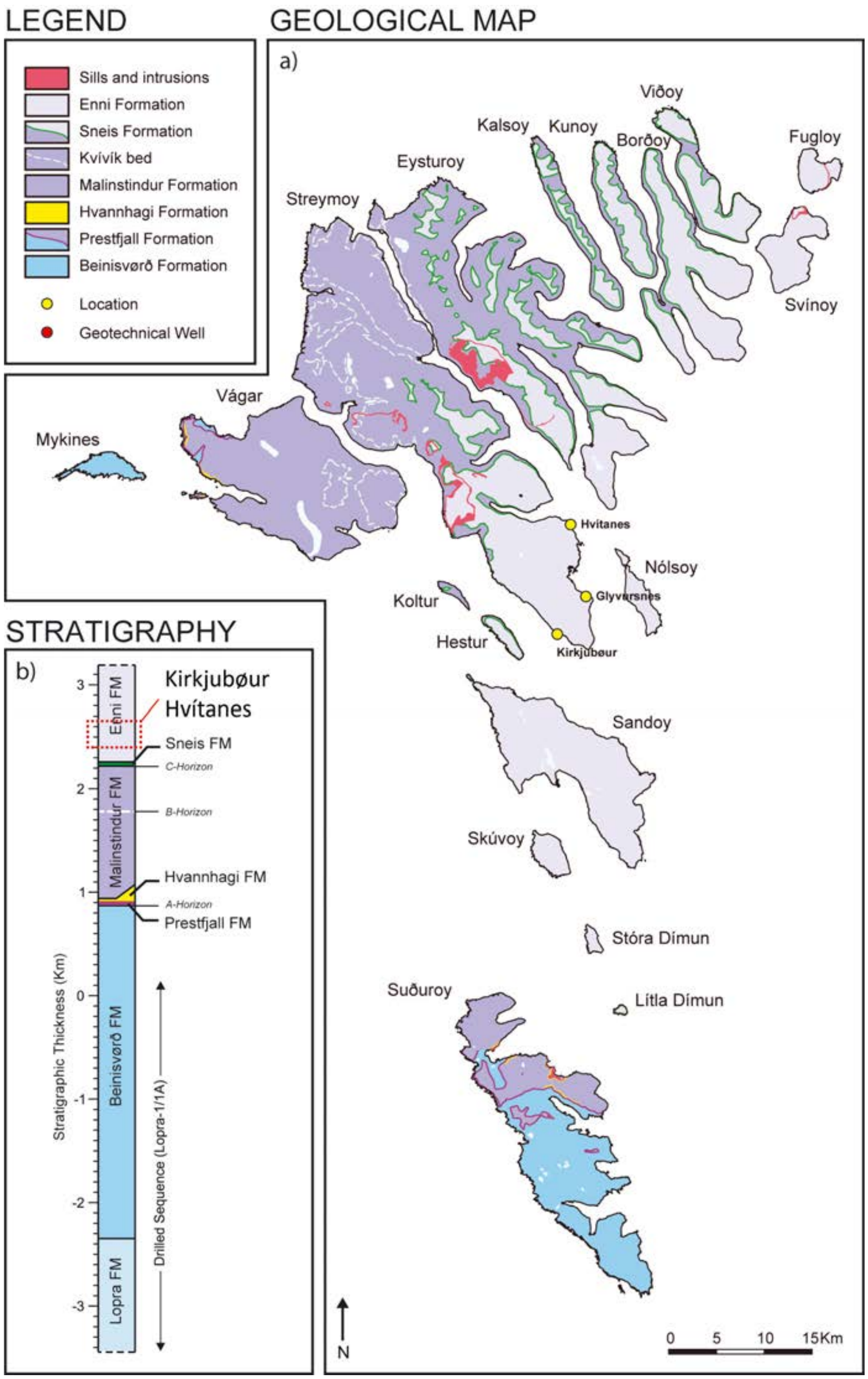

Fig. 3. Simplified geological map of the Faroe Islands (a) and stratigraphy of the onshore parts of the Faroe Island Basalt Group (b). Modified after Passey and Jolley 2009.

origin and are mainly field rubble picked from the ground.[5]

In addition to an investigation of masonry and the provenance of the building and decorative stones, including soapstone, we also discuss the mortars, which are made from burnt shells (s*kilp* in Faroese).[6] Furthermore, notes on stone weathering are included, mainly to draw attention to the similarities in weathering between natural outcrops and what can be observed at Múrurin. This, as well as other aspects of this chapter, requires a basic understanding of Faroese geology, which will also be dealt with.

This chapter is based on observations at the cathedral, field walks in the surrounding area and at other, selected places, as well as previous investigations. The fieldwork was mainly carried out over a few days in July 2017 and so it was impossible to make detailed maps and cover all aspects needed for a sound interpretation. Nor was it possible to properly investigate the other churches and buildings that comprise the wider Kirkjubøur site. Also, no petrographic analyses have been carried out, and consequently the interpretation of the stones relies on visual inspection only. Thus, the results are of a preliminary nature.

Geology and rock types of the Faroe Islands

The basaltic rock formations on the Faroe Islands are exposed remnants of one of the largest volcanic provinces in the world, the North Atlantic Igneous Province (NAIP) (Fig.2).[7] It features rocks which were formed when the North American and Eurasian continental plates began to drift apart and as the Atlantic Ocean opened. The NAIP is also found on East Greenland, Baffin Island, West Greenland, Jan Mayen Island, Iceland, Northern Ireland and Great Britain. Offshore, volcanic sequences cover much of the Greenland margin from Cape Farewell to the East Greenland Ridge, the Jan Mayen microcontinent, as well as a large part of the area from southern Rockall to Lofoten.

The NAIP contains a wide range of rock types, including tholeiitic and alkali basalts, nepheline- and quartz-syenites, nephelinites and carbonatites. However, all the rocks on the Faroe Islands are classified as basaltic, with thin volcaniclastic sedimentary beds, which are not suitable for building stone, in between the subaerial lavas flows.

Faroe Islands Basalt Group (FIBG) covers the basaltic lava sequence onshore as well as the offshore continuation onto the Faroe Platform, the Faroe–Shetland Channel and the banks south of the Faroe Platform. The islands themselves are a 1399km^2 remnant archipelago of the extensive subaerial volcanic sequence (Fig. 3), which encompasses an area of some 120,000km^2.[8] The formations of the FIBG comprise a stacked sequence of lava flows with a total stratigraphic thickness of about 6.5km. The formations are divided based on lithostratigraphic field criteria and dominant flow morphology, which in the FIBG are mostly simple and compound type flows. Thus, from bottom to top we find formations named *Lopra*, *Beinisvørð*, *Prestfjall* (coal bearing), *Hvannhagi*, *Malinstindur*, *Sneis* and *Enni*, ranging in age from a little more than 60 to *c.*55 million years (Ma).[9] The entire southern part of Streymoy, including the Kirkjubøur area (and Tórshavn and vicinity), as well as the neighbouring island Sandoy, belongs to the uppermost Enni Formation (Fig. 3).

The Enni Formation (previously named the Upper Formation[10]) has a minimum stratigraphic thickness of 900m, but it has been estimated that about 1km has been eroded away.[11] The sequence contains interfingering compound-braided lava flows and tabular-classic sheet flows. They are frequently separated by very thin sedimentary horizons, which indicates that there were pauses

Fig. 4. The rubble masonry of Múrurin, showing the portal and windows in the south-western part of the nave. Note large, polygonal stones lower down and more slab-like stone at higher elevations. Photo Per Storemyr 2017.

between the volcanic events, as the soil had time to develop and create an environment suitable for forests to colonise the then subtropical, flat landscapes. At this time, some 60–55 million years ago, the Faroe Islands were situated much farther south than today. Volcanic activity eventually died down as the area moved out of the active volcanic rift zone. On moving north, the subtropical climate of the area cooled over the next 40–50 million years, culminating in the ice ages of the Quaternary period. Erosion during the ice ages transformed the landscape into the deep valleys, steep mountain slopes and narrow fjords that we see today.

For a visual classification of rocks, the basalt flows of the FIBG are subdivided into three broad groups, based on their macroscopic petrographic textures.[12] The first group consists of rather hard basalts that often, but not always, lack phenocrysts (visible light minerals) and typically have a fine-grained aphanitic groundmass. The second group has softer and often vesicular ('porous') basalts that include a wide variety of porphyritic textures (with plagioclase as the most common visible, whitish mineral). They are normally formed in the higher, gas-rich portions of individual basalt flows. Lastly, there are the greenish olivine-porphyritic basalts, which are characterised by small (<5mm) olivine phenocrysts. Varieties of all these basalt types are present at Múrurin. Furthermore, various volcanoclastic rock types, tuffs and pyroclastic rocks are found in the islands. These are not as abundant as the lavas and have not been observed at Múrurin.

The rubble masonry of Múrurin

The overall architectural features of Múrurin are the topic of other chapters in this volume, whereas the details of building techniques and restoration works have been examined in several previous reports.[13] Most investigators mention the 'compact' rubble masonry, a masonry in which the stones have been fitted together by the extensive use of pinning stones (*klipur* in Faroese, flat, small stones in the joins between the rubble). They also note the limited use of lime mortar in joints and masonry cores, which can be explained by the lack of limestone and the scarcity of shell deposits in the islands, and of the absence of any imported lime from Scotland or Norway (see below).

When compared with Scottish examples, the masonry is a variety of 'Type 3' in the regional classification scheme.[14] A similar classification scheme has not been worked out for Norway where rubble masonry often is divided into "Romanesque" and "Gothic" categories.[15] However, medieval rubble masonry is commonly rather similar in Norway, Scotland, and The Faroe Islands.

Generally, the *c.*1.6m thick walls are characterised by exterior and interior faces of coursed, hardly worked, large rubble stones of hard, dark basalt (Fig. 4). The basalt is slightly porphyritic, with feldspar (plagioclase) inclusions, and it looks vesicular (porous) when these minerals are weathered away (Fig. 5). Many of the quoins have been shaped to rectangular/cubic forms, and other stones may have had odd corners removed by hammering. (Fig. 6). Furthermore, some basalt blocks may have been split to obtain even surfaces. As observed on the wall heads, the masonry features a thin core with a lot of stone between the rubble faces, and very little mortar (Fig. 7). The wall heads have been heavily

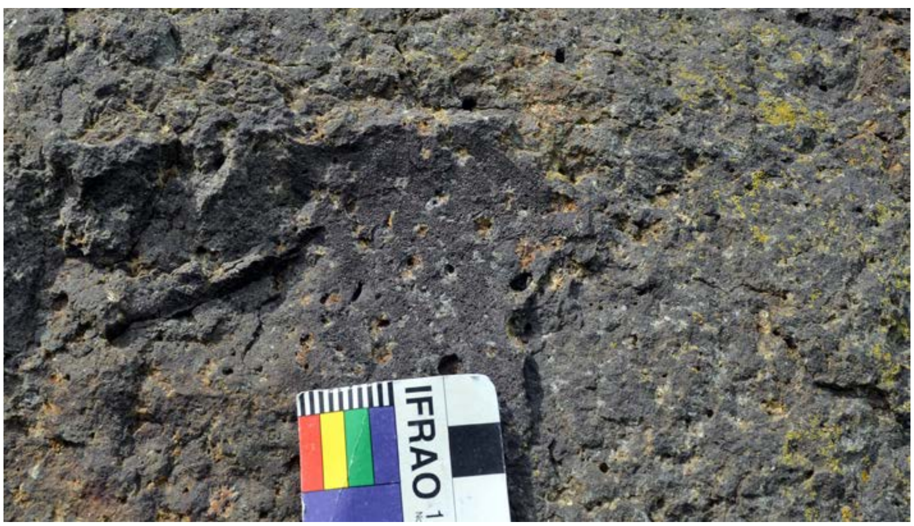

Fig. 5. The main rubble building stone, a hard, slightly porphyritic dark basalt with small phenocrysts of plagioclase, which are often weathered, leaving a porous surface. Photo Per Storemyr 2017.

Fig. 6. The western facade with the remains of masonry belonging to the vanished tower. The quoins have been worked into rectangular forms. Photo Per Storemyr 2017.

modified during the restoration work of the last 150 years,[16] and so there is a doubt whether the walls might be of more, or less, massive construction lower down. However, core drilling in lower parts indicates that the masonry is rather massive, indeed.

There is typically a marked difference in stone size from bottom to top, with the larger stones (up to 1.5m long and 1m high) in the lower parts of the walls. Around the windows there are smaller stones, which are often slab-like, and then larger stones again further up, but these are not as big as in the lowest courses. These differences may reflect the availability of stone at the site during the building process.

With a petrography similar to the rubble stone, there is extensive pinning in all parts of the ma-

Fig. 7. The south-eastern wall-head under restoration in 2017. There are slab-like blocks and a very narrow core with little mortar. Photo Per Storemyr 2017.

sonry, especially around the bigger, rounded or polygonal stones in the lower portions. In places, the horizontally laid pinnings make up whole panels of a size that nearly matches the principal building stones (Fig. 8). A comparison with Norway shows that the masonry structure has much in common with roughly contemporary, Gothic masonry on the west coast. Utstein and Selja Abbey churches, as well as the interior masonry of Bergen cathedral, are some of the most striking examples (Fig. 9).[17]

There is – as we also shall see below – a specific origin of much of the pinning stone at Múrurin. This is because the local basalt has undergone so-called onion-skin or spheroidal weathering (mainly in previous, subtropical climates[18]), leaving suitable flakes that can be gathered. Such flakes can also be seen 'attached' to many masonry blocks. In other words, these blocks also show onion-skin weathering, which must be regarded as a primary reason for the widespread flaking (or exfoliation) of the stones at the church (Fig. 10).[19] Given the onion-skin weathering, it is possible that the trimming of the blocks included chipping off loosely attached flakes, which in turn could be used for pinning. Below, we shall also see that geology, i.e. the crack pattern in local deposits, explains the polygonal forms of many rubble blocks and why their faces look so even.

In the highest wall elevations there are many roughly rectangular, slab-like blocks, which seem

Fig. 8. The rubble masonry at the east end of the cathedral, with widespread use of pinning stone in vertical joints. Photo Per Storemyr 2017.

Fig. 9. Rubble masonry with widespread use of pinning stone at Selja Monastery, western Norway. Photo The Norwegian Directorate for Cultural Heritage.

Fig. 10. A basalt block with pronounced spheroidal weathering at the south facade of Múrurin. Photo Per Storemyr 2017.

Fig. 11. Typical decorative stones at Múrurin: Greyish and brownish/purplish soft basalt, both porphyritic. West portal in the south façade. Photo Per Storemyr 2017.

to be different from the rounded and polygonal blocks below (and above). The colour of these generally aphyric basalts is lighter and the onion-skin weathering is not so pronounced or is even absent on some. It is thus reasonable to suggest that they have a different origin. A similar phenomenon can be observed with the quoins, where some stones have similar properties to the harder decorative stones in the windows and portals.

The decorative stones of Múrurin

Carved into fine mouldings, tracery, small sculpture, springers, wall ribs, voussoirs and other features of the windows, portals and vaults,[20] the decorative stones are generally very different from the bulk basalt rubble. They mainly consist of a variety of softer basalts, most of which have a porphyritic texture with plagioclase as the primary phenocrysts (Fig. 11). They come in colours like purple, greenish and grey and are often very vesicular or porous, with po-

Fig. 12. Extreme cavernous weathering (tafoni) of soft decorative stone. West portal in the south facade. Photo Per Storemyr 2017.

rosity either a primary feature, created by gas as the basalts cooled, or originating from a later dissolution of specific minerals. A few greenish blocks of much harder olivine basalt have also been spotted, particularly in the west portal of the south facade.

The primary reason for selecting such stones for carving must have been their relative softness. However, with their porphyritic texture they are also beautiful stones, especially the purple varieties. We can think of the famous 'Imperial Porphyry', a similar, though harder rock quarried in the Eastern Desert of Egypt, which became extremely fashionable across the entire Roman Empire 2000 years ago, and has enjoyed reuse and fame until the present day, including in Britain.[21]

Unfortunately, the porphyritic stones suffer from fast weathering at the church, which results in deep alveoles and caverns.[22] So fast has the weathering been that the bulk of the stones have lost much or all of their carved features (Fig. 12). Though the exact reasons remain unclear, the processes are connected to salt weathering and so-called tafoni-formation.[23] We shall see below that these and similar rocks suffer from exactly the same decay at natural outcrops on the islands.

This fast weathering may have some implications for the interpretation of the building history of Múrurin. There has been much discussion about whether the church was completed, particularly if roof and vaults were ever finished (except in the sacristy attached to the north side of the church).[24] If pointed rib vaults, with webbing of either stone or wooden planks, were constructed using soft porphyritic basalt for the ribs, such stone may perhaps have deteriorated rapidly and contributed to an early collapse. There is certainly a need to take into account the fact that the stones would have been indoor, but water leaks and humidity may also have taken their toll, even within a roofed construction.

Fig. 13. Greyish-bluish-greenish, homogeneous soapstone at Múrurin. Reliquary box in the east facade. Photo Per Storemyr 2017.

The soapstone

Soapstone was used for the consecration crosses carved in relief on small slabs set into the basalt masonry and also for the relief panel of the reliquary box (*Gullskápið*) in the east wall. Moreover, there are medieval sculpture fragments and baptismal fonts made from soapstone in Faroese museums collections.[25] Since soapstone had to be imported, its provenance is of particular interest, as it may indicate connections to overseas workshops involved with the building of Múrurin. Norway, which was a large producer of soapstone in the Middle Ages, may appear to be the most likely place of origin, especially the west coast with its numerous quarries. However, Shetland (and Greenland) had soapstone industries in the Middle Ages and thus the question of provenance might be more complex than at first sight.[26] Unfortunately, it has not yet been possible to carry out petrographic analysis and scientific provenance studies, e.g. based on trace elements and stable isotopes. As for now, it is therefore only possible to draw inferences based on visual inspection.

The consecration crosses and reliquary box appear to be similar in colour, structure and composition. It is a greyish-bluish-greenish, rather homogeneous soapstone, with talc and probably chlorite as the main minerals. It has slight foliation and seems to lack visible carbonate mineral veins and aggregates (dolomite, magnesite and/or calcite) (Fig. 13–14). Based on our own observations of its visual appearance it would seem that the stone type is dissimilar to the vast majority of soapstone types used across medieval West and Central Norway, e.g. in Trondheim, Bergen and Stavanger. Almost all of the dozens of soapstone types once used in this region, as well as

Fig. 14. Greyish-bluish-greenish, homogeneous soapstone at Múrurin. Consecration cross inside the church. Photos Per Storemyr 2017.

generally in Norway, feature carbonate mineral veins and aggregates, which are often easily recognisable from their brownish oxidation colour. The Kirkjubøur reliefs are also dissimilar to the greenish, soft chlorite schists often used along with soapstone in Norway (e.g. in Stavanger and Trondheim).[27]

A key contemporary building that features soapstone was the Apostle Church (III) in Bergen, which was erected around 1300. We could naturally speculate whether raw blocks or finished objects might have been shipped to the Faroe Islands from the workshop responsible for the church. Unfortunately, the Apostle Church was soon destroyed, but it is believed that much of its soapstone was reused in the sixteenth century, e.g. for decorating the nearby Rosenkrantz tower.[28] A detailed study of all the dozens of soapstone decorations at the tower shows that they are typical representatives of regional soapstone types, often schistose and with smaller and larger carbonate veins and aggregates.[29] It is thus unlikely that the Múrurin consecration crosses and reliquary box can be connected to the Apostle Church.

At first glance with no obvious connection to Norway, future provenance studies of the reliefs therefore must also include the soapstone deposits in Shetland. There are several old quarries in Shetland, and many have already been geochemically fingerprinted in connection with studies of Viking Age vessels and other objects,[30] a similar situation to that of Norway. Hence, databases for future provenance studies of the Múrurin reliefs exist, which can also be used for provenancing other soapstone objects, now in Faroese museum contexts, as well as sculpture from Múrurin. Some of these objects feature clear carbonate veins and hence might originate in Norway.


Argir Beds
Map by S.Passey (2004)
Árnanes Flow
Sandoy tunnel
0
0.5
1km

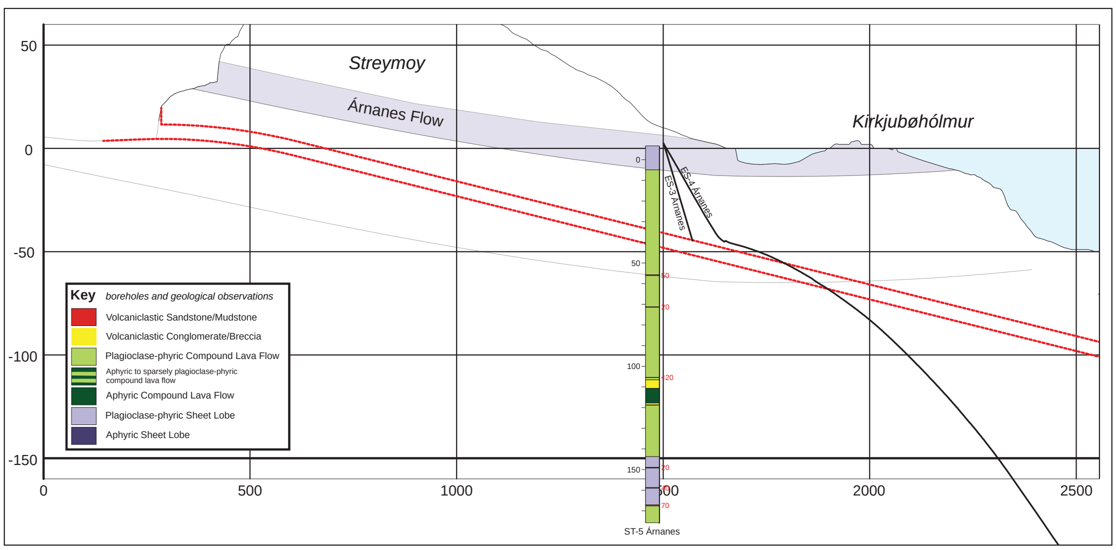
Streymoy
Árnanes Flow
Kirkjubøhólmur
ES-4 Árnanes
ES-3 Árnanes
ST-5 Árnanes
Key boreholes and geological observations
Volcaniclastic Sandstone/Mudstone
Volcaniclastic Conglomerate/Breccia
Plagioclase-phyric Compound Lava Flow
Aphyric to sparsely plagioclase-phyric compound lava flow
Aphyric Compound Lava Flow
Plagioclase-phyric Sheet Lobe
Aphyric Sheet Lobe
50
0
-50
-100
-150
0
500
1000
2000
2500

Fig. 16. The Árnanes peninsula 400–500m north-west of Múrurin feature basalt outcrops with stone similar to what is observed at the cathedral. Photo Per Storemyr 2017.

The geology of the Kirkjubøur area and the provenance of rubble stone

An important source for the geology of the Kirkjubøur area is the detailed mapping undertaken across the mountains from Kirkjubøur, at the southeast-tip of Streymoy, to just south of Tórshavn (Glyvurnes).[31] In broad terms, the volcanic stratigraphy at Glyvursnes correlates with the stratigraphy in the Kirkjubøur area, as confirmed by our own field walking in both regions. Another source for detailed geological descriptions, are the reports written by the Faroe Islands Geological Survey prior to the construction of the new tunnel that connects Streymoy and Sandoy. These reports include detailed core descriptions of the relevant stratigraphy, mapping and logged profiles onshore. The Sandoy tunnel passes directly below Kirkjubøur.

Fig. 15. Volcanic stratigraphy and the extent of the Árnanes basalt flow between Glyvurnes and Kirkjubøur. Modified after Passey 2005.

In the context of this chapter, the most important trait of the geology is the existence of the so-called Árnanes basalt flow,[32] the lowest onshore

Fig. 17. Polygonal crack pattern, even surfaces and signs of spheroidal weathering in the basalt outcrops at Árnanes. Photo Per Storemyr 2017.

unit in the stratigraphy at Kirkjubøur (Fig. 15). This basalt is hard, dark, homogeneous and generally porphyritic with small clusters of diffuse, irregular phenocrysts (plagioclase), making up 5–15% of the volume. It is indistinguishable from the bulk of the building stones at Múrurin.

This basalt flow is seen from 0–42m depth in a drill core at Árnanes;[33] it extends onshore from south of Kirkjubøur and continues several kilometres along the shoreline towards the northwest (Fig. 15). The flow is also described as the Høvdhamarin flow[34] and is estimated to cover a minimum area of *c*.200km^2 with a minimum volume of 2–3km^3. Most of the loose boulders and blocks on the current foreshore at Kirkjubøur are from this flow. A striking exposure is Árnanes itself, 400-500m northwest of Múrurin (Fig. 16). Here, we can recognise all features that we also find in most stones in the masonry of the church: similar petrography, texture and, not least, structures; generally polygonal crack pattern but with many 'straight' or even cracks (Fig. 17) and widespread evidence of onion-skin weathering (Fig. 18).

It would have been very easy to select individual boulders along the shore from Múrurin towards Árnanes or to lever out blocks that were partially attached to the bedrock at Árnanes. Today, there are thousands of tonnes of stone still easily available. We could have proceeded as the medieval quarrymen probably did as they erected Múrurin; loading the stones, each of which weighs up to several hundred kilos, on sledges, and transporting them to the building site either through the strength of men or cattle, or perhaps horses.

However, the environment and landscape in the Kirkjubøur area has radically changed since the Middle Ages. Slight land subsidence, followed by storms and hurricanes, have contributed to the erosion of a significant stretch of land and thus the little islet, Kirkjubø Hólmur, some 400m southwest of the church, would have been accessible on foot 700-800 years ago.[35] The geology of this islet is similar to that along the current shoreline, and the implications are obvious: in the Middle Ages, Kirkjubø Hólmur may also have provided building stone.

Although we have studied all of the basalt at Múrurin and in its near environs, it is now impossible to determine whether loose boulders were just chosen along the shore or whether they were levered out from the bedrock along pre-existing cracks in one or several real quarries. Storms and hurricanes have altered the landscape – and the rock deposits – in such a profound manner that traces of potential quarrying activities will have been lost.

Stone not readily observed in the Kirkjubøur environs

What about the rectangular, slab-like and often smaller blocks found in elevated portions of the Múrurin masonry? In the Árnanes flow such stones are absent, but we could spot similar stone among the generally rounded blocks along the shores. This could imply that such stone is available among the other basalt flows higher up the steep slopes above Kirkjubøur. If so, it is reasonable to suggest that less eroded blocks than those on the shoreline were obtained from screes, or on land that was cleared for agriculture around the site.

Similar arguments can be put forward for some soft and rather porous stones used for the quoins and in some places around the portals and windows. However, our observations of soft stones which we found when we climbed the very steep slopes at Kirkjubøur do not suggest that the bulk

Fig. 18. Pronounced spheroidal weathering of a basalt boulder along the shoreline by Árnanes. Photo Per Storemyr 2017.


Streymoy
Kaldbak
Kaldbaksvegur
Akkersvík
Hvítanes
Norðradalur
Hoyvík
Kyrberg
Vegurin Langi
Tórshavn
Nólsoy
Argir
Kirkjubøreyn
Velbastaður
Kirkjubøarvegur
Glyvurnes
Gamlarætt
Hestur
Kirkjubøur hillside
Kirkjubøur
Arnanes
Skopunarfjørður
Skopun
Sandoyartunnilin
Heimasandsvegur
Sandoy
Borgarurð
Hvalnes
Sandur
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0
1
2km

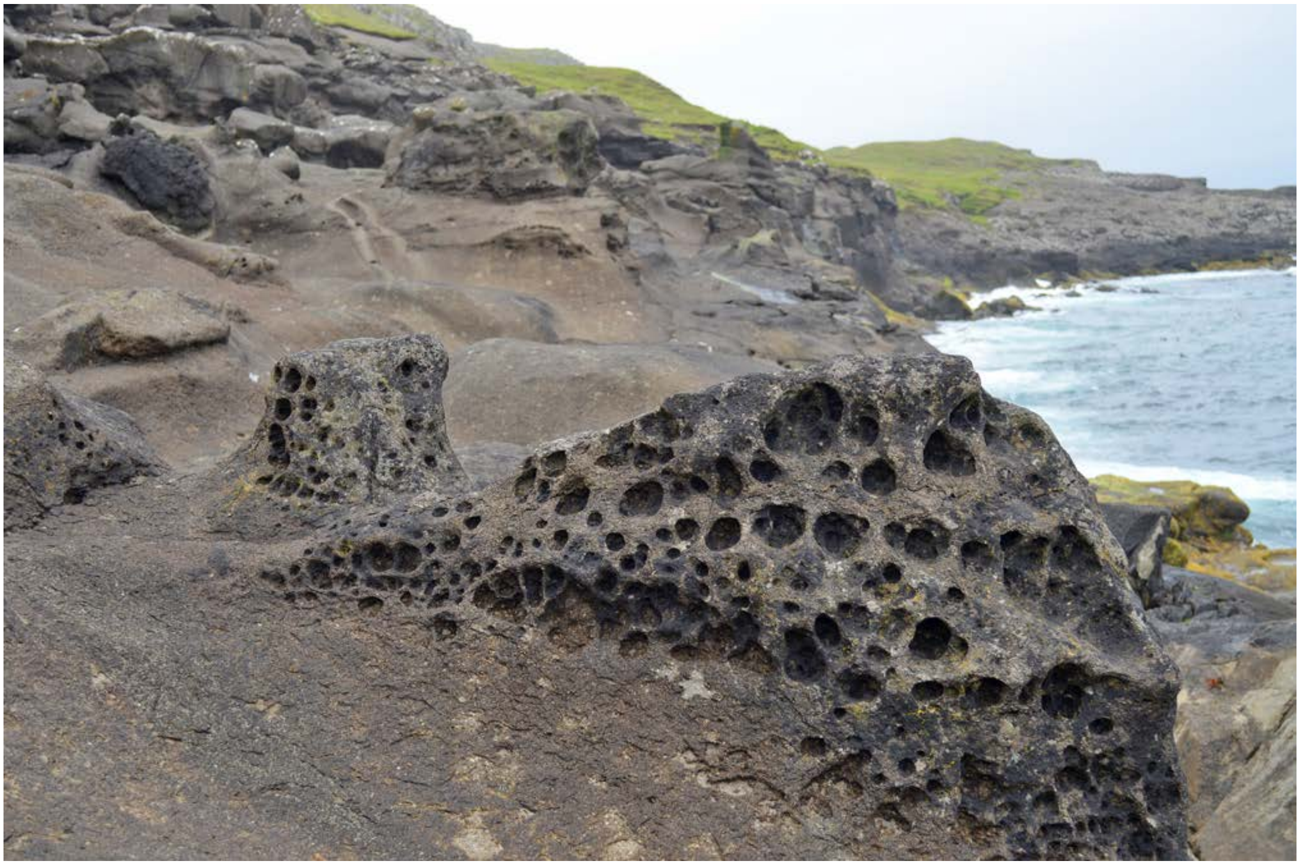
Fig. 20. Alveolar weathering (tafoni) in soft, porphyritic basalt at Kýrberg, north of Tórshavn. Photo Per Storemyr 2017.

of the decorative stones is of a local origin. There are certainly soft stones in the volcanic formations in the hills behind the Múrurin, but the porphyritic nature of the local, soft stones is not as pronounced as at the church, insofar as plagioclase feldspars are not as well developed. There is also a lack of the highly porous stones that we find in the portals and windows of Múrurin, as well as of olivine basalt.

Another indication that decorative stones were not provided from the local geology is that there is no proof of a quarry for such stone. It would have been very cumbersome to sort and pick possibly suitable stones along the shore or on clearing agricultural land. A rough estimate, considering that there are 13 windows and portals at Múrurin and potentially eight pointed rib vaults, indicate that up to 100m^3 of soft stone were used for the finer masonry. Further, considering that larger raw blocks must have been carved to produce the fine decorative stone, we can assume that much more, perhaps some 200m^3, were actually provided for the building site. This amounts to some 600 tonnes of raw blocks. Given that suitable bedrock deposits are available within acceptable reach, it would have been easier to rely on such deposits than on loose stones.

Fig. 19. Places surveyed for soft, porphyritic basalt deposits at Streymoy and possible, but not surveyed, deposits at Sandoy. Map modified from https://kort.foroyakort.fo/kort/.

Fig. 21. Akkersvík by Hvítanes features purple, soft porphyritic basalts (inserted). Photos Per Storemyr 2017.

The provenance of the decorative stone

Since it is impossible to assign most of the decorative stones at Múrurin to local deposits, surveys were made in several areas between Kirkjubøur and Tórshavn (Glyvurnes, Kirkjubøreyn, Gamlarætt, fig. 19), with negative results. Local knowledge indicated that similar stone is present within the Enni Formation at Kýrberg by Hoyvík, about 3km north of Tórshavn, as well at slightly north of Hvítanes (Akkersvika), another 2km north of Kýrberg (generally 15–17km by boat from Kirkjubøur). Observations at these places indicated that the rocks are very similar indeed to the decorative stones at Múrurin, with a variety of purple to greyish, porous porphyritic basalts. However, at both places, plagioclase phenocrysts generally seem slightly larger and better developed than what can be observed at Múrurin.

Moreover, at Kýrberg, with its spectacular geology, featuring fantastic forms of deep alveolar and honeycomb weathering (tafoni), it is difficult to land a boat close to the cliffs (Fig. 20). Thus, we presume that this location has to be ruled out as a source of stone for Múrurin. But the rock formations supply good comparable evidence of the tafoni weathering, as seen on the Múrurin decorative details, and it demonstrates the natural origin of such weathering forms.

At the northern reaches of Hvítanes, in Akkersvika, there is much better accessibility, with a bay and a small boat landing (Fig. 21). There are also other places close to Hvítanes where it would have been entirely possible to load stone onto boats to sail to Kirkjubøur. We may have missed important deposits while surveying the area around Hvítanes, and further field walking ought to be carried out.

Further survey is necessary not least because Hvítanes is a possible location for the burning of shells for lime mortar for Múrurin. There are historically recorded lime burning facilities at Hvítanes (see below), and so it would have been a good place from where decorative stone could also be shipped. It is easier to produce and ship materials from a place with some infrastructure available, than from a place where everything had to be constructed from scratch.

We also have to look for other places from where soft decorative stones could have come. There is indeed a local story that suggests that stone was shipped from Borgarurð at Sandoy, just 12km across the fjord from Kirkjubøur. The story is attributed to Tróndur Pætursson from Skálavík (Sandoy) and retold in Jóannesi Dalsgaard's book Søgur og søgubrot.[36] It is a dramatic story, involving the loss of several boats. Importantly, Borgarurð and its environs are known by geologists to feature soft porphyritic stone, and thus this area also ought to be carefully surveyed in the future (Fig. 22).

The provenance of the lime for the mortar

Borgarurð is important because it is situated just by Hvalnes (Fig. 22). And here comes the second part of the story told by Tróndur Pætursson.[37] For at Hvalnes, Pætursson indicates, it has been said that seashells or shell sand (Faroese: *skilp*) were procured for lime burning for Múrurin. The story may have its origin in Jens Chr. Svabo's work on the archipelago in the early 1780s. Svabo was

Fig. 22. Potential places on Sandoy for the procurement of soft porphyritic basalt (Borgarurð) and shell for lime (Hvalnes) for Múrurin. Map modified from https://kort.foroyakort.fo/kort/.

familiar with the practice of burning sea shells to make lime, and he gives references to the well-known oyster shell burning by European settlers in North America.[38] He reports that large deposits of *skilp* had previously been found at Hvalnes, and were used for lime burning for Múrurin, but that storms and waves had eradicated much of the deposits by the time of his visit.[39]

It is not known whether the shells were burnt at Hvalnes or at Kirkjubøur, but Jóannesi Dalgaard comments that Hvalnes, unlike Kirkjubøur, was actually a good place to procure turf for fuel.[40] For an archipelago which had practically been without woods since before human occupation and animal grazing had begun,[41] turf and peat were the traditional fuels,[42] just like most North Atlantic coastal areas until recently, perhaps at times supplemented by drift wood. However, in the early modern period and into the twentieth century, domestic coal was also important in the Faroe Islands. This is because of the coal seams on Suðuroy, which have been known since at least the early seventeenth century and intermittently mined from the eighteenth century, especially for household use.[43] Although one may speculate that domestic (or imported) coal may have been used as fuel for lime burning in more recent centuries, it is highly unlikely that it was used in the Middle Ages. Coal was first used for lime burning in Britain in the late Middle Ages.[44]

More recent investigations convincingly confirm that Múrurin was entirely built using very good lime mortar burnt from seashells.[45] This implies that burning was a local endeavour and that the availability of lime did not rely on imports. Kirkjubøur was thus part of the significant North Atlantic tradition of burning seashells, an ingenious tradition that stretches from regions poor in limestone and marble along the western and northern coasts of Scotland, to the west coasts of Denmark and Sweden, and several other places, including Iceland and Greenland.[46] This was part of a wider, global practice of burning seashells for mortar in regions that lacked limestone or marble. In Norway, however, burning seashells was rarely undertaken, neither during the introduction of lime in the early Middle Ages, nor later on. So far, with mortar analyses available from quite a few medieval churches, there are two conclusive examples of seashell lime in churches at the west coast and in the central part of the country. Both are repair mortars from the post-Reformation period. In addition, there are inconclusive reports of possible seashell mortar in 3-4 churches.[47] Presumably, the reason why burning seashells never became a larger tradition in Norway is because of available marble deposits along the coasts and the abundant limestone in the Skien-Oslo-Hamar region.[48]

It seems that the only known historical record of burning seashells in the Faroe Islands is related to Hvítanes, where the practice was ongoing in the eighteenth century[49] and continued until the 1920s.[50] Interviews with local inhabitants at Hvítanes, presumably conducted by Sverri Dahl in the 1950s,[51] indicate that there were still remains of several kilns in the 1940s. The kilns were up to 3m across, with thick (1m) and low (1m) stone walls/circles. There were large amounts of shell fragments and ash, as well as burnt fieldstones, in and around the kilns. Today there is hardly anything left on the surface, as these parts of the Hvítanes peninsula have been transformed into agricultural land/animal grazing. But beach deposits of coarse shell sand can still be observed (Fig. 23).

It is thus difficult to reconstruct how the kilns actually worked. This is also because we do not really know whether shell sand or whole seashells were used for burning. From modern experiments, it has been shown that it is difficult, but feasible, to burn whole shells in a proper kiln with a firing chamber below and shells stacked above. This

Fig. 23. Beach with coarse shell sand at Hvítanes, north of Tórshavn. Photos Per Storemyr 2017.

takes longer time as compared to burning lumps of limestone/marble, since shells have a tendency to fragment during burning and thus hamper the draught.[52] Burning shell sand will probably obstruct the draught even more, depending on the shell type and shell fragment size. In either case, at the Faroe Islands, we probably have to envisage an earth-mound, clamp or heap kiln (Norwegian: *mile*), with layers of shells/coarse shell sand and dry peat/turf alternately stacked, the stone ring around it intended to keep the heat required to obtain the necessary 850 degrees centigrade needed for calcination. This a well-known, old method which is used across the globe, although it is very inefficient in comparison to other types of kilns.[53]

Though it is reasonable to suggest that this method was used in the Middle Ages in the Faroe Islands, it cannot be confirmed, even after the excavation of possibly preserved and dated kilns (^{14}C dating of the ash), unless a stacked kiln that was never fired is found. The best way to find out is therefore to undertake experiments. Moreover, it is impossible at present, of course, to state anything categorical about whether lime for Múrurin came from Hvítanes, from Hvalnes, from both of these places – or from entirely different ones.

Concluding remarks

It is intriguing, indeed, that there might be a connection between the procurement of lime and decorative stone for Múrurin, at both Hvítanes and Hvalnes/Borgarurð. But this remains a hypothesis until further investigations through survey, excavation and ethnographic studies (old folk tales, place names etc.) can be carried out. It would, of course, not be the first time in history that various mineral resources were procured from the same place where the desired resources were actually present. Procurement centres often developed where more than one stone type or other mineral resource was available, with famous examples including Aswan in Ancient Egypt and the Purbeck Peninsula in Dorset (UK). Similar, but much smaller productions centres are also known across the globe, such as the combined quarrying of limestone and marble for building stone and lime burning, utilising different stone qualities within the deposits. Such centres attract able people who learn from each other. With the infrastructure available (tools, huts, transportation, food etc.), however inferior, it is often much better to go for one place than to start from scratch elsewhere.[54]

This said, it was Múrurin itself that was the centre for craftspeople working in stone and lime in the Faroese Middle Ages. Construction went on for many years and, though it is not known from where the builders came, we can tell that they were able craftsmen. This is evident from the excellent masonry they constructed, the fine carvings they made and the good lime they burnt and mixed into mortar and plaster.

The practice of burning seashells for lime is fascinating because this tradition hardly originate in Norway. Influences rather have to be sought elsewhere, for example in the islands off the coast of the Scottish mainland. Similarly, as it is hard to find visually matching soapstone in Norway, it should not be taken for granted that the soapstone used for decoration at Múrurin originated from there. Shetland must also be considered as a possible place of origin. Thus, influences related to material procurement and craftsmanship may well be come from the British Isles.

There is much work still to be done until the procurement of material for Múrurin is fully understood, but this study shows that practically all hard stone for the rubble masonry was provided from the **Árnanes** basalt flow in the immediate environs of the church. Moreover, it no longer remains a complete mystery as to where the soft decorative stones as well as lime might have come, with Hvítanes and Hvalnes as the hypothetical locations which need to be followed up. It is also clear that the procurement of stone followed the same strategy as in much of medieval Norway and across the globe: the bulk of the building stones were found close by the building site, the finer stones and lime, of which less was required, were transported by boat to the site from farther away – and as regards soapstone from much farther away.

NOTES

[1] Previous, general references to building materials include Dahl 1985, von Jessen 1986 and Eliasen 1995.
[2] Also noted by Jessen 1986 and Larsen 2008.
[3] Storemyr 2015; cf. Ekroll 1997; 2008.
[4] McMillan 2017a, 2017b, see also Richard Oram, *Kirkjubøur and Scotland,* pp. 411–38 in this volume.
[5] As stated in e.g. von Jessen 1986, p. 5; Brandt Pedersen et al. 1989, p. 2.
[6] Survey and analyses in Johansson 2008. On the history of Faroese *skilp*, see later in this chapter (p. 321).
[7] See e.g. Saunders et al., 1997.
[8] See Passey and Jolley 2009.
[9] Storey et al. 2007, Waagstein et al. 2002, Wilkinson et al. 2016.
[10] Noe-Nygaard and Rasmussen 1969.
[11] Jørgensen 2006, Waagstein et al. 2002.
[12] Noe-Nygaard & Rasmussen 1969.
[13] Descriptions starting with Svabo 1959 (1976). More recent works, see e.g. Dahl 1985; von Jessen 1986; Krogh 1988; Brandt Pedersen et al. 1989, Eliasen 1995, Arge 2008.
[14] See Richard Oram (cf. note 4).
[15] See e.g. Lidén 1974.
[16] Eliasen 1995, p.15.
[17] See Morten Stige, *The norwegian Parallels,* pp. 385–410 in this volume.
[18] Cf. Goudie 2004, p. 992.
[19] An explanation of additional weathering forms is given in Larsen 2008.
[20] The art history of the decorative stones is treated in Kjartan Hauglid, *Sculpture and Patronage,* pp. 343–84 in this volume.
[21] See e.g. Maxwell and Peacock 2001, Williams 2018.
[22] Further description of weathering in Larsen 2008.
[23] On tafoni, see Goudie 2004, pp. 1034–35.
[24] Krogh 1988, pp. 89-102, Eliasen 1995 and Kirstin S. Eliasen, *Múrurin – The Cathedral,* pp. 187–246 in this volume.
[25] See Kjartan Hauglid (cf. note 20), cf. Krogh 1988.
[26] See overviews and individual papers in Hansen and Storemyr 2017, which also contains several scientific provenance studies that may serve as inspiration for future studies of the soapstone at Kirkjubøur.
[27] Based on observations over more than 30 years, see Storemyr 2015. Øystein Jansen, who has inspected the Múrurin reliefs and has the best knowledge of soapstone types in the wider Bergen region, has informed the authors that he has not been able to observe obvious similarities to the Múrurin reliefs.
[28] See Hoem 2015, p. 46.
[29] See Storemyr and Meeks 2016.
[30] See Forster & Jones 2017.
[31] See Passey 2005, undertaken as part of the SeiFaBa Project Funded by the Sindri Group.
[32] Described by Heinesen et al. 2016.
[33] See Højgaard 2016.
[34] By Passey & Jolley 2009.
[35] See e.g. Krogh 1988, pp. 108-109; Símun V. Arge and Morten Stige, *The Site and Archaeology,* pp. 11–56 in this volume.
[36] Dalsgaard 1978, our English translation of the book's title: 'Legends/tales and stories'. See also Snar 2022.
[37] In Dalgaard 1978.
[38] Svabo 1959 (1976), §439-440 .
[39] Svabo 1959 (1976), §985-986 .
[40] Dalgaard 1978.
[41] Recent investigations indicate that occupation goes back to *c.*AD 500, see Curtin et al. 2021.
[42] See Arge 2005. Turf and peat generally have a long tradition of use for lime burning, see e.g. Wingate 1985, p. 64.
[43] See the comprehensive description of coal and coal mining in the Faroe Islands in Rasmussen & Noe-Nygaard 1969, pp. 141 f., with references to scholarly works back to the late eighteenth century.
[44] See e.g. Wingate 1985, p. 49.
[45] See Johansson 2008 and Larsen 2008.
[46] See e.g. Thacker 2013, 2016, and Gundesen 1940.
[47] Recent investigations by one of the authors (Storemyr) has found evidence of the burning of seashells for post-Reformation repairs at the thirteenth-century Hesby church in the Stavanger region. At Kinn church on the west coast, seashell mortar was used for repairs in the post-Reformation period and might have been used already in the Middle Ages, but conclusive evidence is lacking, see Hoem 2018 and Storemyr 2023, analyses by Seir 2016. Possible seashell mortar in medieval churches in Central Norway has ben reported by von Konow 1998, but also here the evidence is inconclusive.
[48] See e.g. Storemyr 2015.
[49] Svabo 1959 (1976), §986.
[50] See Johansson 2008.
[51] See note with the Faroe cultural heritage authorities, "Hvítanes – Skilpovne", transcribed 26.7.2017.
[52] See Storemyr 2018 and 2019.
[53] See e.g. Wingate 1985. Burning oyster shells in an uncovered wood-fired heap or *mile* has recently been tested with success in Norway, see https://www.kalkforum.org/nyhed-foraar-2021.
[54] See e.g. Storemyr 2015.

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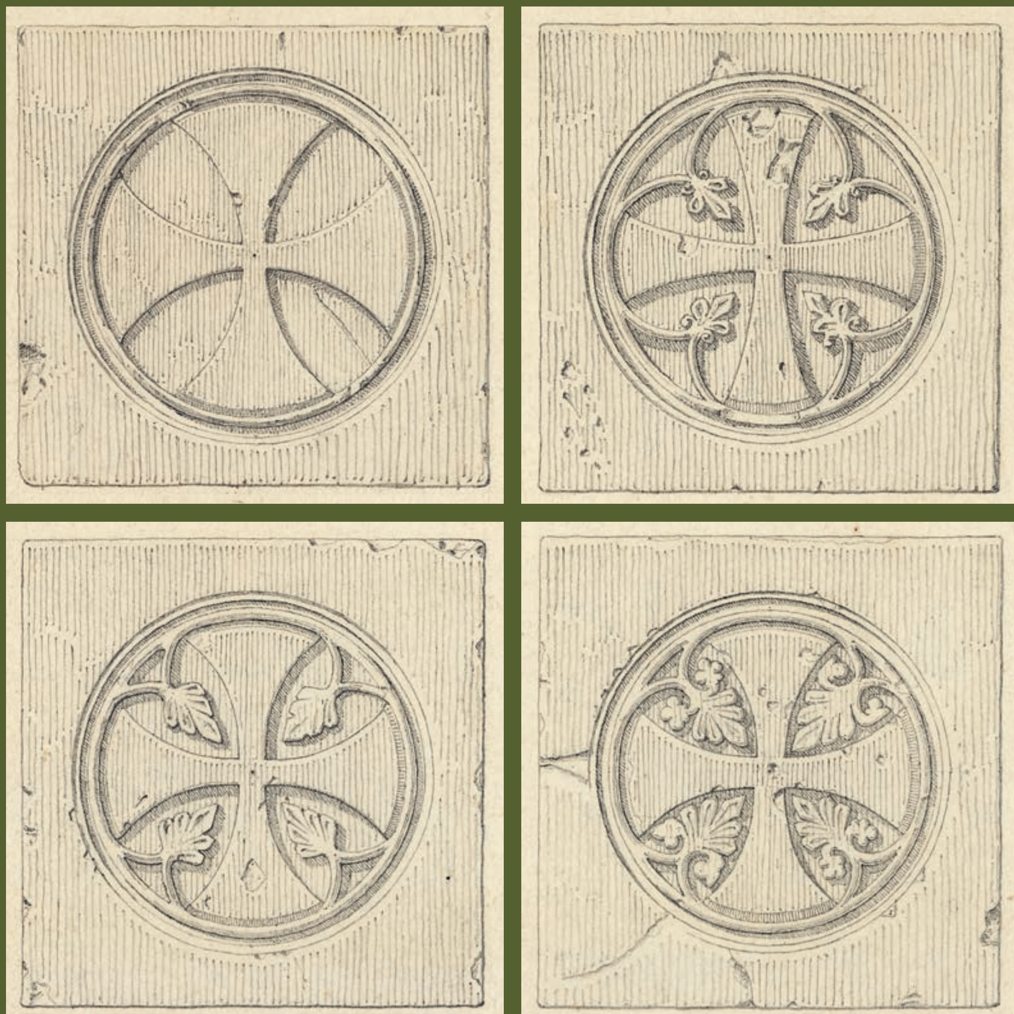

In 2011 and again in 2018, meetings known as "pondering meetings" were organized in Kirkjubøur. The purpose was to create a forum to reflect on the cultural and historical significance of the archaeological monuments at Kirkjubøur and to discuss research possibilities. Specialists in art history, archaeology, architecture, geology, craftsmanship, ornamentation, and church interior design were invited. The plan was to place these topics in a comparative context with our neighbouring countries. This international collaboration was evident in the participants, who included experts from Norway, Denmark, Scotland, and England, in addition to those from the Faroe Islands.

This book is a direct outcome of the pondering meetings. It is a collection of 17 articles by 12 authors.

TJÓÐSAVNIÐ

Tórshavn 2024

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