Chapter 12

Local Availability and Long-range Trade: the Worked Stone Assemblage

Colleen E. Batey, Amanda K. Forster, Richard E. Jones, Geoff Gaunt, Fiona J. Breckenridge, Judith Bunbury and James H. Barrett

12.1. Introduction

On a site without waterlogged deposits in an archipelago without forests it is not surprising that worked stone was a significant component of the recovered portable material culture. Five-hundred objects of stone are summarized in the following chapter and itemized in Appendix 12.1. Nevertheless, it is remarkable that a high proportion of this material is demonstrably or probably imported. The steatite (soapstone) has come from Shetland and Norway, mostly in the form of vessels (the broken fragments of which were sometimes recycled as other objects). The Eidsborg schist came from Norway, in the form of hones for sharpening blades. Schist of Norwegian origin was also imported as bake stones of the kind traditionally used for making unleavened bread. Mica schist hand querns for grinding grain were also of non-local origin. They could have come from Norway, Shetland, the Scottish Highlands or the Western Isles.

Local stone was used for expedient pounders, anvils and 'pot lids'. Moreover, locally available stone replaced imported schist for use as hones in the later phases of occupation. Flakes of struck flint, probably from the use of strike-a-lights, may also have derived from locally collected material. Lastly, a few portable architectural features (such as pivot stones) were made of local stone.

The use of stone material culture at Quoygrew is indicative of networks of supply and culturally significant choices. Steatite was the favoured raw material for vessels in Viking Age and medieval Norway, but not in mainland Scotland, the Western Isles or elsewhere in the North Sea and Irish Sea regions. The use of schist hones and bake stones (and possibly also the mica schist querns) similarly indicates that access to products of Norwegian provenance and/or style was at times both possible and desirable.

This chapter discusses the stone artefacts from Quoygrew as subdivided by a combination of raw material and object type, with the goal of balancing ease of use and economy of presentation. Studies of provenance — based on ICP-MS (inductively coupled plasma mass spectrometry) analysis, the optical examination of lithology using hand specimens and thin-section analysis — are included. The basic unit of quantification is the find number, which may represent a single object or a small collection of objects (such as vessel sherds) found together.[12]

12.2. The steatite

12.2.1. Rare earth element analysis of the steatite

The largest category of worked stone (299 finds) was of steatite. This raw material is not local to Orkney, but could have come from any number of quarries in Shetland and Norway thought to have been worked during the Viking Age and Middle Ages (Forster 2004a, 2; 2009a; Fig. 12.1). Thus 31 steatite objects from Quoygrew were selected for chemical characterization by ICP-MS. The compositions were then examined in order to assess whether or not the artefacts had a similar origin and to make some statement about the

12. The objects were catalogued by Colleen Batey, Pieterjan Deckers and James Barrett. Richard Jones wrote the report on chemical characterization of the steatite finds. Geoff Gaunt identified the raw material of the hones and the quern fragments based on optical examination of lithology. Fiona Breckenridge and Judith Bunbury conducted the thin-section analysis of the hones. Amanda Forster, Colleen Batey and James Barrett wrote the section on typological analysis of the steatite. Geoff Gaunt, Fiona Breckenridge, Colleen Batey and James Barrett wrote the hones section. The remaining sections were authored by Colleen Batey and James Barrett, with raw material identifications by Geoff Gaunt.

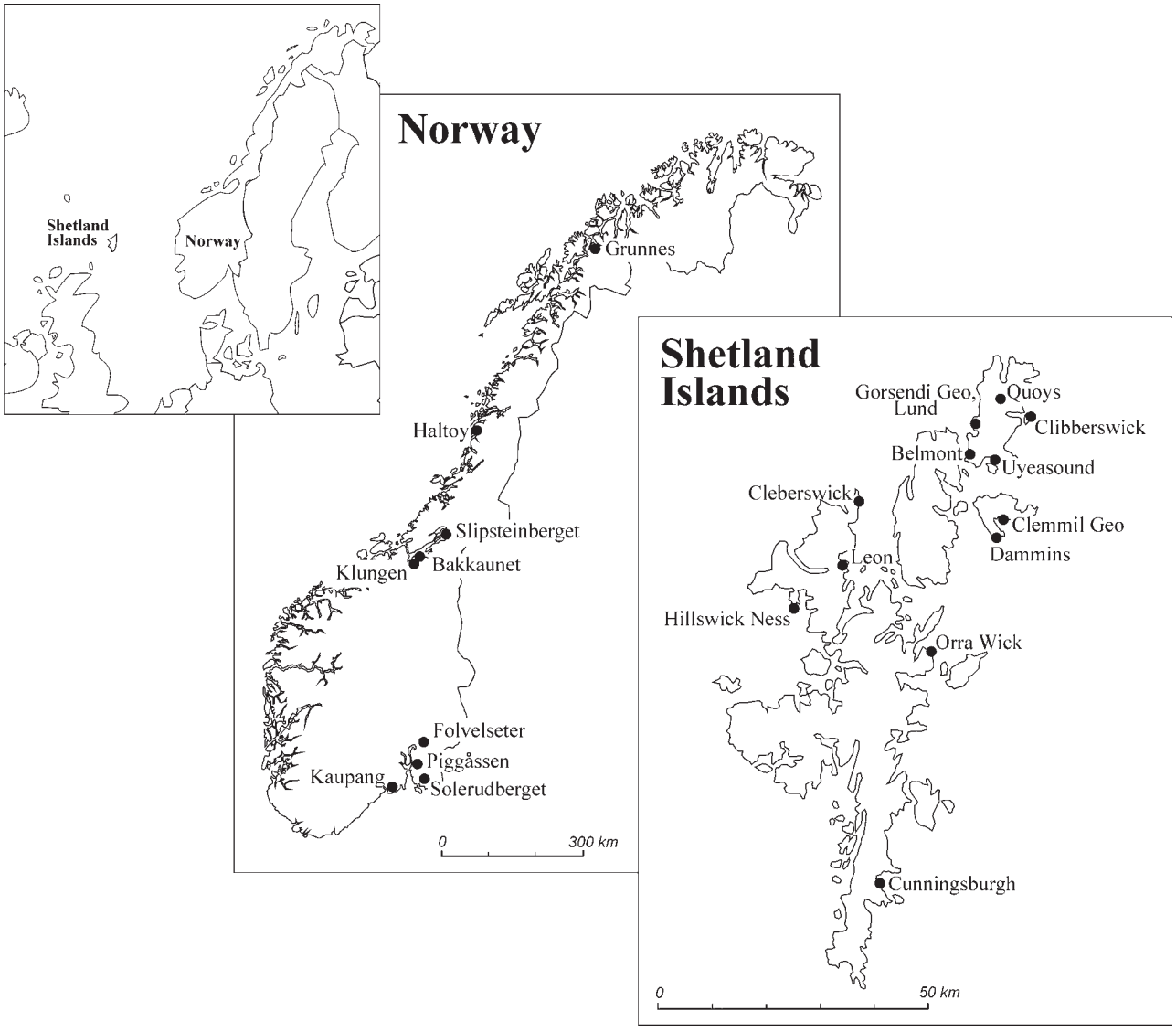

Figure 12.1. *Locations of the Shetlandic and Norwegian steatite sources included in the chemical characterization study. Not included on the map is Fluetjern which lies east of Kaupang. (Image: Lorraine McEwan and Richard Jones.)*

possible identity of their origin or origins (cf. Jones *et al.* 2007; Baug 2011, 329–31).

The analysed finds, all vessel sherds, were selected to include examples of different shape from different phases and locations (Table 12.1). After cleaning an area of the cross-section of each sherd, multiple drillings were taken with a tungsten carbide drill head (2.5 mm diameter) and the pooled powder (at least 500 mg) collected. In the case of Sf. 62127, which was too weathered for drilling, a cleaned fragment was prepared and crushed to powder in an agate mortar. In two cases — Sfs. 7929 and 60672 — the opportunity was taken to obtain samples drilled at different locations on the artefact in order to assess the extent of possible heterogeneity of composition. This exercise was taken a step further in the case of Sf. 61998 for which there was one drilled sample and three small fragments crushed to powder. Valerie Olive carried out the analyses by ICP-MS at the Scottish Universities Environmental Research Centre, East Kilbride, using an Agilent 7500ce instrument. The analytical procedure and acid dissolution method are described by Jones *et al.* (2007).

The concentrations (in ppm) of fourteen rare earth elements (REE) are given in Appendix 12.2. Visual examination of the REE pattern and concentration range of the data in chondrite-normalized form indicates a good measure of uniformity in composition among the samples apart from Sfs. 61132, 62160, 62154 and 62137. Principal component analysis of the

Table 12.1. *Quoygrew steatite samples characterized by ICP-MS.*

Find no.	Context	Vessel form	Attributed source (Discriminant analysis)	Attributed source (Typology)	Detailed phase	Location
60909	F243	Four-sided	Shetland (Clibberswick)	Shetland	4.1	Room 2 layer
62255	F1203	Four-sided	Shetland (Clibberswick)	Shetland	2.2	House 5 layer
70093	G058	Four-sided	Shetland (Clibberswick)	Shetland	2–3	Farm Mound midden
70101	G058	Four-sided	Shetland (Clibberswick)	Shetland	2–3	Farm Mound midden
7535	G015	Four-sided	Shetland (Cunningsburgh)	Shetland	2–3	Farm Mound midden
7546	G022	Four-sided	Shetland (Cunningsburgh)	Shetland	1.2	Farm Mound midden
60604	F055	Four-sided	Shetland (Cunningsburgh)	Shetland	4.3–4.4	Room 1 layer
60672	F206	Four-sided	Shetland (Cunningsburgh)	Shetland	4.2.1	Room 2 floor layer
61685	F891	Four-sided	Shetland (Cunningsburgh)	Shetland	3.2	Room 1 paving
62138	F1130	Four-sided	Shetland (Cunningsburgh)	Shetland	2.4	House 5 floor layer
62151	F1103	Four-sided	Shetland (Cunningsburgh)	Shetland	3.1	Area F layer
62158	F1106	Four-sided	Shetland (Cunningsburgh)	Shetland	3.1	Area F dump
62459	F1103	Four-sided	Shetland (Cunningsburgh)	Shetland	3.1	Area F layer
62154	F1110	Hemispherical	Norway (Fluetjern?)	Norway?	2.2–2.4	House 5 dump
62160	F1075	Hemispherical	Norway (Fluetjern?)	Norway?	3.2	Room 3 floor layer
7654	G022	Hemispherical	Shetland (Clibberswick)	Norway?	1.2	Farm Mound midden
7966	G052	Hemispherical	Shetland (Clibberswick)	Norway?	2–3	Farm Mound midden
61471	F538	Hemispherical	Shetland (Cunningsburgh)	Norway?	3.5	Room 1 floor layer
61545	F548	Hemispherical	Shetland (Cunningsburgh)	Uncertain	3.5	Room 1 pit fill
62234	F1184	Hemispherical	Shetland (Cunningsburgh)	Norway?	2.2	House 5 floor layer
70254	G090	Hemispherical	Shetland (Cunningsburgh)	Norway?	2–3	Area G3 midden
61998	F995	Hemispherical handled	Shetland (Cunningsburgh)	Norway?	2.2–2.4	North Midden
62137	F1129	Uncertain	Norway	Uncertain	2.4	House 5 floor layer
61132	F036	Uncertain	Norway (Fluetjern?)	Uncertain	4.3–4.4	Room 1 floor layer
7952	G048	Uncertain	Shetland (Cleberswick)	Uncertain	2-3	Farm Mound midden
7640	G022	Uncertain	Shetland (Clibberswick)	Uncertain	1.2	Farm Mound midden
62127	F1159	Uncertain	Shetland (Clibberswick)	Uncertain	2.3	House 5 floor layer
7929	G048	Uncertain	Shetland (Cunningsburgh)	Uncertain	2-3	Farm Mound midden
61638	F842	Uncertain	Shetland (Cunningsburgh)	Uncertain	3.3	Room 1
61639	F842	Uncertain	Shetland (Cunningsburgh)	Uncertain	3.3	Room 1
61649	F846	Uncertain	Shetland (Cunningsburgh)	Uncertain	3.3	Room 1 floor layer

log-transformed composition data confirms that these four finds are clear outliers (Fig. 12.2).

The Quoygrew data can be compared with reference data for known occurrences of steatite in Shetland and Norway. In addition to the data presented by Jones *et al.* (2007) for some of the major Viking Age and medieval quarries on Shetland, it is now possible to add data for other Shetland quarries (including those on Fetlar) and for several quarries situated in, first, western and northern Norway, most of which have been exploited since the Viking period, and, second, east of Kaupang (Baug 2011, 329–31).

The REE pattern of the *main* group of Quoygrew samples visually resembles that of the Cunningsburgh quarry in Shetland, both in shape and in concentration ranges. Moreover, when the Quoygrew samples (excluding the above-mentioned outliers) are added to a discriminant analysis consisting of reference groups from the three main Shetland quarries (Cunningsburgh, Clibberswick and Cleberswick) all Quoygrew samples are assigned to Cunningsburgh apart from 7640, 7654, 7966, 60909, 62127, 62255, 70093 and 70101 (to Clibberswick) and 7952 (to Cleberswick) (Fig. 12.3). Bearing in mind the known variability in composition within the Cunningsburgh source, it is plausible that all members of the main group are from Cunningsburgh.

Turning to the four outliers from Figure 12.2, they have been added as individual samples to a discriminant analysis consisting of (a) the three Shetland reference groups, (b) four reference groups east of Kaupang in Østfold and Akershus — from Solerudberget, Fluetjern, Folvelseter and Piggåssen — and (c) *single* samples (kindly supplied by Tom Heldal of the Geological Survey of Norway) representing quarries in western and northern Norway — from Bakkaunet, Klungen and Slipsteinberget situated inland between Trondheim and Bergen, and Haltoy and Grunnes situated well to the north of Trondheim. The minimum information that can be drawn from this exploratory

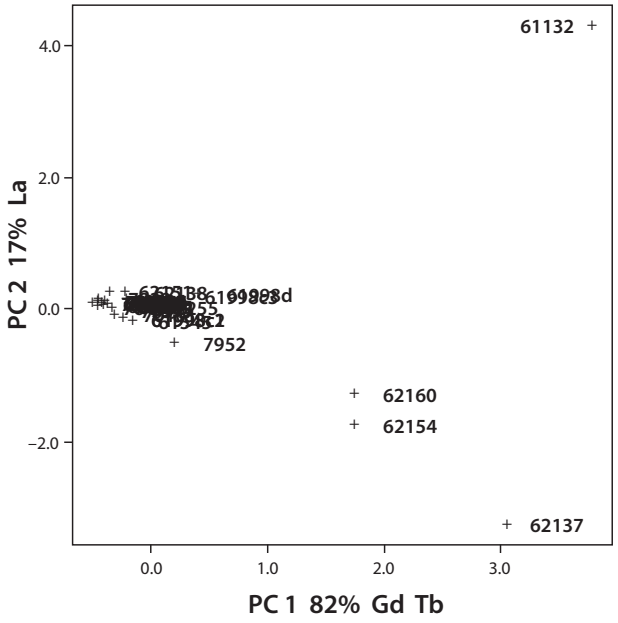

Figure 12.2. *Results of a principal component analysis of the Quoygrew steatite REE composition data in the form of a plot of the first two principal components. Note the four outliers.*

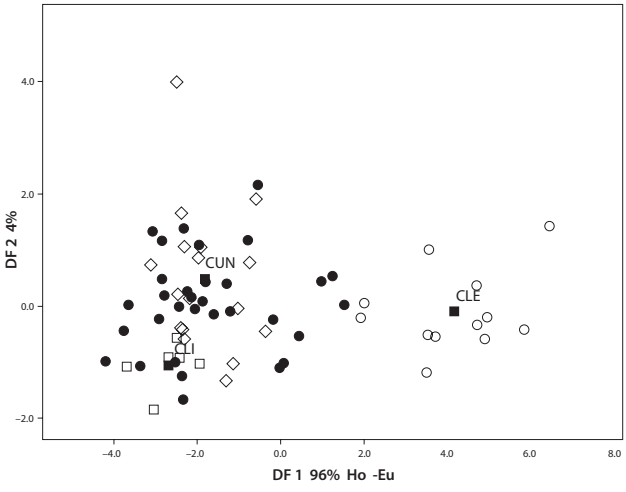

Figure 12.3. *Discriminant analysis of the Quoygrew samples (black circle) and three Shetland reference groups — Cunningsburgh (CUN diamond), Clibberswick (CLI square) and Cleberswick (CLE open circle). The centroids for the three reference groups are marked as black squares. Discrimination between Cleberswick and the two other quarries is apparent on the axis of the major discriminant function (DF1) which is dominated by the Ho and Eu contents. The distinction between the Cunningsburgh and Clibberswick quarries is along the much less powerful discriminant function DF2.*

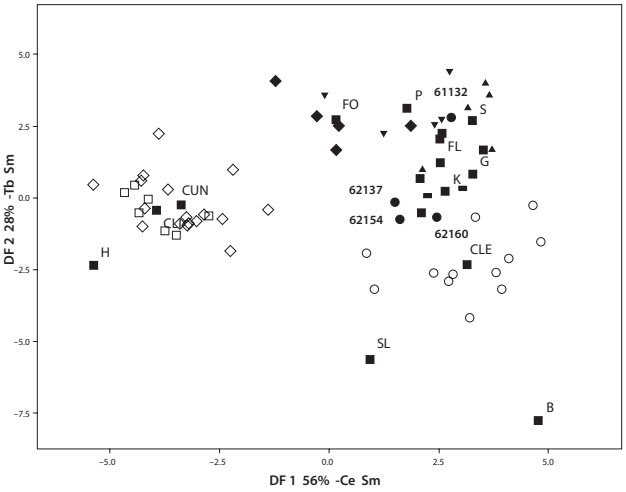

Figure 12.4. *Discriminant analysis of: Quoygrew samples 61132, 62160, 62154 and 62137 (full circles); the three Shetland reference groups (CUN, CLI and CLE); the reference groups from Solerudberget (S full triangle), Fluetjern (FL full square), Folvelseter (FO full diamond) and Piggåssen (P inverted triangle) in Norway; several individual reference samples from Bakkaunet (B), Haltoy (H), Klungen (K full rectangle), Slipsteinberget (L) and Grunnes (G) in Norway. The principal discrimination is along DF1 dominated by the Ce and Sm contents, but there is also significant discrimination along DF2 which allows some of the Norwegian quarries to be distinguished from each other.*

Table 12.2. *Summary of the steatite assemblage.*

Find type	No. of finds	%	Weight (g)	%
Vessel	111	37.1	24,056.4	96.2
Spindle whorl	12	4.0	343.5	1.4
Line sinker	1	0.3	81.1	0.3
Worked fragment	20	6.7	318.8	1.3
Amorphous fragment	155	51.8	194.4	0.8
Total	**299**	**100.0**	**24,994.2**	**100.0**

analysis (Fig. 12.4) is that 61132, 62160, 62154 and 62137 are all likely to be Norwegian in origin. Whether the specific assignment by the discriminant analysis of 61132, 62160 and 62154 to Fluetjern is indeed a correct indication of origin must await future comparison with a larger data base.

When the discriminant analysis results are compared with typological interpretation both approaches indicate a Shetlandic origin for all of the sherds of four-sided vessels included in the characterization study (Table 12.1). Conversely, many of the hemispherical vessels were attributed a Shetlandic origin by REE analysis despite being interpreted as of possible Norwegian origin based on their form and surface treatment (see below). Either unsampled Norwegian

Table 12.3. *Worked stone by general phase.*

Find	Phase										Unphased	'Palaeosol'	Total
	1	2	2–3	3	3–4	4	4–5	5–6	6	7			
Steatite vessel: hemispherical	3	4	11	6	1		1		1			1	**28**
Steatite vessel: hemispherical handled		1											**1**
Steatite vessel: four-sided	1	5	19	7		3						2	**37**
Steatite vessel: bucket-shaped		1											**1**
Steatite vessel: uncertain form	6	6	19	9		2						1	**43**
Steatite vessel: uncertain form handled			1										**1**
Steatite vessel fragment?	4	2	10	1				1		1			**20**
Steatite fragment	36	24	65	18	1	5	1	1		4			**155**
Steatite spindle whorl		1	4	2	1	2	1			1			**12**
Mica schist spindle whorl						1							**1**
Sandstone spindle whorl				1	2	1	2						**6**
Steatite weight						1							**1**
Mica schist weight				1			1						**2**
Sandstone weight				3		2	1						**6**
Schist bake stone				2									**2**
Eidsborg schist hone		5		7		1				1			**14**
Probable Eidsborg schist hone							1						**1**
Probable purple phyllite hone	1												**1**
Sandstone hone				3		1				1			**5**
Sandstone hone or weight						1							**1**
Sandstone grinding slab						1							**1**
Mica schist quern				1		1							**2**
Mica schist quern?						1							**1**
Mica schist disc				1		1							**2**
Mica schist fragment	17		7	2		19		1			1		**47**
Sandstone quern?				1					1				**2**
Sandstone pounder	1			5	1	7	1			2	2		**19**
Sandstone anvil?						4							**4**
Pumice float						1							**1**
Pumice	3	3	5		4	3	2	1					**21**
Gunflint											1		**1**
Flint	3	1	5	5	1	3	3	8	1	6	4	2	**42**
Sandstone pivot		1						1					**2**
Sandstone vessel		1											**1**
Other		2	4	4		2	1	1		1	1		**16**
Total	**75**	**57**	**150**	**79**	**11**	**63**	**15**	**14**	**3**	**17**	**9**	**6**	**500**

steatite sources have a chemical signature similar to that of the Shetlandic quarries or hemispherical vessels (including examples with lug handles) were being copied by Shetlandic steatite workers. For the present, the latter interpretation is taken as the most probable.

Despite this discrepancy, both chemical and typological study are consistent with the presence of a large group of steatite vessels imported from Shetland at Quoygrew, supplemented by a smaller but nevertheless significant group imported from Norway. In terms of chronology, sherds of Shetlandic origin were recovered from Phases 1 to 4 inclusive. Although fewer in number, finds attributed to Norway were recovered from house-floor contexts of Phases 2, 3 and 4 (although the last may be residual, see below). Moreover, their absence from Phase 1 should not be seen as significant as only three finds of this date were included in the REE study. Both Shetlandic and Norwegian vessels were probably imported to Quoygrew from the time of the settlement's foundation until the end of the Middle Ages.

12.2.2. The steatite assemblage: a typological overview

The 299 finds of steatite (weighing *c.* 25.0 kg) from the Quoygrew excavations are summarized in Tables 12.2 and 12.3. The recognizable objects — 111 vessel sherds, 12 steatite spindle whorls and a single unfinished fishing line sinker — are all common to Viking Age and

Table 12.4. *Worked stone from Area G by detailed phase.*

Find	Phase			Total
	1.2	2–3	6	
Steatite vessel: hemispherical	3	7	1	**11**
Steatite vessel: four-sided	1	12		**13**
Steatite vessel: four-sided repaired		2		**2**
Steatite vessel: uncertain form	5	11		**16**
Steatite vessel: uncertain form handled		1		**1**
Steatite vessel fragment?	4	3		**7**
Steatite fragment	36	44		**80**
Steatite spindle whorl		3		**3**
Probable purple phyllite hone	1			**1**
Mica schist fragment	17	7		**24**
Sandstone quern?			1	**1**
Sandstone pounder	1			**1**
Pumice	3	5		**8**
Flint	2	3	1	**6**
Other		3		**3**
Total	**73**	**101**	**3**	**177**

medieval sites in the Northern Isles. The spindle whorls and sinker were all definitely or probably manufactured from recycled vessel sherds. Most or all of the vessel fragments represent cooking pots. A significant minority (29 sherds) were from circular or oval vessels with hemispherical profiles. A larger number (37 sherds) were from square or subrectangular (four-sided) vessels. A single example of a round or oval 'bucket-shaped' vessel, a circular form with flaring sides and a flat base, was also found. Twenty other fragments of steatite were clearly from worked objects, but were too badly preserved to be of certain artefact type. In addition, 155 small chips of steatite were recovered. Most or all are likely to represent debris from the reworking of vessel sherds, although some limited import of raw material is also likely (see below).

When weight is taken into account, the vessel sherds represent the most substantial part of the steatite assemblage (Table 12.2). Amorphous fragments make up 52% of the assemblage by number of finds, but only 0.8% by weight. In comparison, vessel fragments make up 96% of the assemblage by weight. Only a small number of other artefacts (spindle whorls and the single line sinker) from Quoygrew are of steatite. This pattern can also be observed at other sites in Orkney of a similar date (see Smith & Forster 2007, 433). It probably reflects the lack of local raw material — the main source of steatite for the manufacture of portable artefacts being sherds of imported vessels.

There are differences, however, in the make-up of steatite assemblages between Orkney and Shetland. In Shetland, steatite was more widely used for the manufacture of portable objects such as weights (both loom weights and fishing sinkers), spindle whorls and, more occasionally, lamps.

One difference between the material from Quoygrew and other sites in both Orkney and Shetland is the lack of steatite bake stones. These Shetland-made artefacts appear in ninth- to tenth-century deposits at Old Scatness Broch in Shetland (Forster 2010) and in *c.* eleventh-century contexts at Pool (Smith & Forster 2007, 418). In Phases 1 and 2 at Quoygrew there is no obvious explanation for this difference, but by Phase 3 the site's occupants clearly had access to alternatives manufactured of Norwegian schist (see below).

All of the steatite finds are summarized by general phase in Table 12.3. A breakdown by detailed phase is provided in Appendix 12.3. As noted above, the full catalogue appears in Appendix 12.1. Tables 12.4 and 12.5 subdivide the assemblage by area, plotting the finds from the Farm Mound and other deposits of Area G separately from the houses, middens and other contexts of Areas A to F, H and J near the shore.

Steatite is common at Quoygrew from the early occupation of the site in Phase 1.2 until the end of Phase 3. The greatest numbers of steatite finds from the site were from Phases 2 to 3, with substantial numbers also in Phases 1, 2 and 3. Finds as late as Phase 3.5 were from well-stratified contexts. Finds from Phase 4, including a well-made partial square vessel from Phase 4.2.1 (Sf. 60672), may imply limited continued use into the fifteenth to sixteenth centuries. However, the Phase 4 material was predominately from floor-levelling deposits and could simply be residual. Small quantities of residual material were also found in later phases. This chronological sequence must be understood in the context of the adoption of ceramic vessels at Quoygrew during Phases 3 and 4 (see Chapter 15). Spatially, the distribution of steatite is similar between the two main area groups — the Farm Mound (Area G) and Areas A to F, H and J near the shore.

12.2.3. The steatite vessels

The assemblage of vessels is the largest group of steatite artefacts at Quoygrew, a trend consistent throughout the stratigraphy and comparable with other sites in Orkney such as Pool (Smith & Forster 2007) and Skaill in Deerness (Porter 1997, 105–6). It is likely that the vessels were manufactured at source, in Shetland and Norway, arriving in Orkney as complete or partly finished objects. The curation of vessels on-site indicates that they were certainly worth repairing. Six examples had repair perforations, some with iron rivets still in place. There is morphological evidence that much of the material originates from the quarry at Catpund, Cunningsburgh (cf. Forster 2009a) — an observation corroborated by the REE characterization

Table 12.5. *Worked stone from Areas A to F, H and J by general phase.*

Find	Phase									Unphased	'Subsoil'	Total
	1	2	2–3	3	3–4	4	4–5	5–6	7			
Steatite vessel: hemispherical		4	4	6	1		1				1	**17**
Steatite vessel: hemispherical handled		1										**1**
Steatite vessel: four-sided		5	4	6		3					2	**20**
Steatite vessel: four-sided repaired			1	1								**2**
Steatite vessel: bucket-shaped		1										**1**
Steatite vessel: uncertain form	1	6	7	8		2					1	**25**
Steatite vessel: uncertain form repaired				1								**1**
Steatite vessel: uncertain form repaired or handled			1									**1**
Steatite vessel fragment?		2	7	1				1	1			**12**
Steatite fragment		24	21	18	1	5	1	1	4			**75**
Steatite spindle whorl		1	1	2	1	2	1		1			**9**
Mica schist spindle whorl						1						**1**
Sandstone spindle whorl				1	2	1	2					**6**
Steatite weight						1						**1**
Mica schist weight				1			1					**2**
Sandstone weight				3		2	1					**6**
Schist bake stone				2								**2**
Eidsborg schist hone		5		7		1			1			**14**
Probable Eidsborg schist hone							1					**1**
Sandstone hone				3		1			1			**5**
Sandstone hone or weight						1						**1**
Sandstone grinding slab						1						**1**
Mica schist quern				1		1						**2**
Mica schist quern?						1						**1**
Mica schist disc				1		1						**2**
Mica schist fragment				2		19		1		1		**23**
Sandstone quern?				1								**1**
Sandstone pounder				5	1	7	1		2	2		**18**
Sandstone anvil?						4						**4**
Pumice float						1						**1**
Pumice		3			4	3	2	1				**13**
Gunflint										1		**1**
Flint	1	1	2	5	1	3	3	8	6	3	2	**35**
Sandstone pivot		1						1				**2**
Sandstone vessel		1										**1**
Other		2	1	4		2	1	1	1			**12**
Total	**2**	**57**	**49**	**79**	**11**	**63**	**15**	**14**	**17**	**7**	**6**	**320**

study above. The substantial workings at Cunningsburgh are still visible at the excavated faces and as numerous pits and mounds across the amphitheatre-like hillside (see Turner *et al.* 2009).

The vessel forms present are illustrated in Figures 12.5 to 12.7. The chronological distribution of each type is summarized in Table 12.3. Forty-four of the vessel sherds could not be attributed to a particular form, but all of these were small fragments. As noted above, the majority of the vessels of recognizable shape were either four-sided or subrectangular, with hemispherical or curved vessels being slightly less frequent. These two forms — four-sided and hemispherical — are the main typological groups of the period. It is now known that hemispherical forms can be either primary Norwegian imports or Norwegian forms manufactured in Shetland whereas four-sided vessels are a specifically Shetlandic form (see Forster 2004a; 2006; 2009a and Section 12.2.1 above).

The number of hemispherical vessels in relation to those of four-sided form can be a useful indicator of date in steatite assemblages from Atlantic Scotland. Early Viking Age assemblages show a large number of hemispherical vessels — often with few four-sided vessels recorded. Recent rescue excavations in Shetland recovered a large assemblage of early Viking Age material at Norwick, Unst, which illustrates the development of the four-sided form as a pragmatic

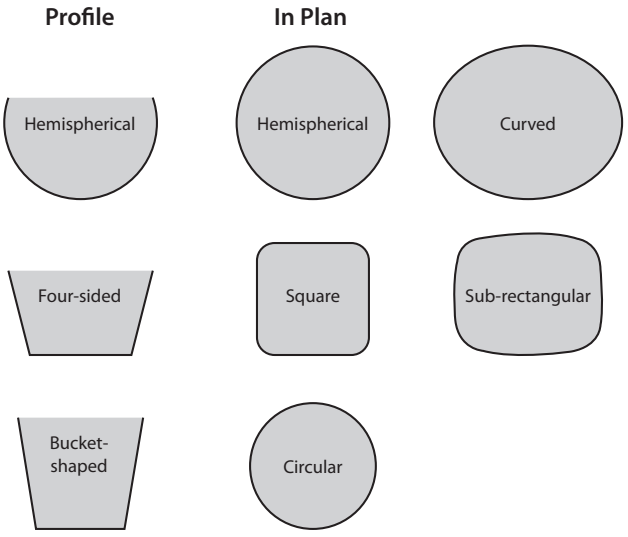

Figure 12.5. *Schematic representation of the steatite vessel forms represented at Quoygrew. (Image: Amanda Forster.)*

response to Shetland's more laminar stone (Forster unpublished). At Quoygrew, hemispherical vessels were only the most abundant form in Phase 1, reflecting the increased use of four-sided vessels in the late Viking Age and Middle Ages (Table 12.3). One atypical find is a bucket-shaped vessel with flaring sides and a flat base (Sf. 61989, see Fig. 12.6).

12.2.4. Hemispherical steatite vessels

Twenty-nine of the 111 vessel finds were from hemispherical pots: circular in plan with curving profiles, rounded bases and no distinct wall-to-base angle (Fig. 12.5). The 29 finds represent a total of 63 individual sherds weighing approximately 4.7 kg. This form of soapstone vessel occurred in well-stratified contexts from Phases 1 to 3 at Quoygrew (Table 12.3). A variety of rim forms were identified within the hemispherical group — tapering, flat, rounded, inward turning and everted — but none demonstrated observable stratigraphic patterning.

The rims came from bowls of a range of diameters. The irregularity of the hand-tooled vessels does not, however, make the assessment of diameters an exact science. There are a few small examples, perhaps in the region of 20 cm (for example Sf. 61131 from Phase 2 and Sf. 61545 from Phase 3.5). A few sherds may also be from large vessels (e.g. Sf. 62160 from Phase 3.2). At Norwick in Shetland, smaller hemispherical vessels were in the region of 160 mm in diameter whilst large examples tended to be between 360 and 480 mm (Forster unpublished). Large hemispherical vessels have also been noted elsewhere, with sizes up to 50 cm identified. Examples include Gord, Fetlar (Batey unpublished) and the Brough of Birsay (Hunter 1986, 189). One of the largest recorded is from Hordaland, Norway, with a diameter of 57.5 cm (Graham-Campbell 1980, no. 40, 16). In the case of large vessels, it is likely that they were set in the fire rather than suspended above it during use. The variability in vessel sizes represented at Quoygrew probably reflects function and availability. No chronological trend is evident.

The thickness of the vessel walls is highly variable, ranging from a minimum of 13 mm, to a more standard range of 19 mm, to a maximum of 24 mm. The quality of steatite is also very varied, ranging from fine-grained examples (e.g. Sf. 61990, Phase 2, where a superior finish was possible) to thick and grainy pieces such as Sf. 61965 from a disturbed midden attributed to Phases 3 to 4. Other pieces were of more inferior-quality stone, which had fractured and disintegrated during use.

The hemispherical vessels sometimes had smoothed surfaces on both internal and external walls (e.g. Sfs. 6475 and 7966, both from Phases 2 to 3). A few sherds had also been worn after deposition, suggesting that they are residual. This evidence is scattered through the stratigraphy as single examples (e.g. Sf. 70086 from Phases 2 to 3).

One hemispherical vessel (Sf. 61998 from Phase 2) — and one vessel of uncertain form (Sf. 7927 from Phases 2 to 3) — had lug handles. Similar trapezoidal handles have been found in a medieval context at Jarlshof (Hamilton 1956, pl. XXXVIII no. 6) and in a late Viking Age or early medieval context at Pool (Smith & Forster 2007, 418).

12.2.5. Four-sided steatite vessels

Thirty-seven finds units represent 63 individual sherds of four-sided vessels weighing a total of 14.2 kg. These are the archetypal Shetland vessel, developed out of working with the very laminar structure of the archipelago's steatite. Earlier prehistoric vessels developed in much the same way, to the degree that it is sometimes difficult to distinguish Bronze Age vessels from medieval ones of similar form (see Forster & Sharman 2009). The form can be broadly described as four-sided with a flat base. Recognizable features include flared, straight walls and a sub-rectangular plan with either sub-rounded corners or very well-defined angles. Fragments without a wall or base angle can be easily confused with curved vessels as the larger examples are almost oval in plan.

It is often the case that four-sided vessels can be identified from tooling and manufacture as well as from the form itself. Several sherds have very distinc-

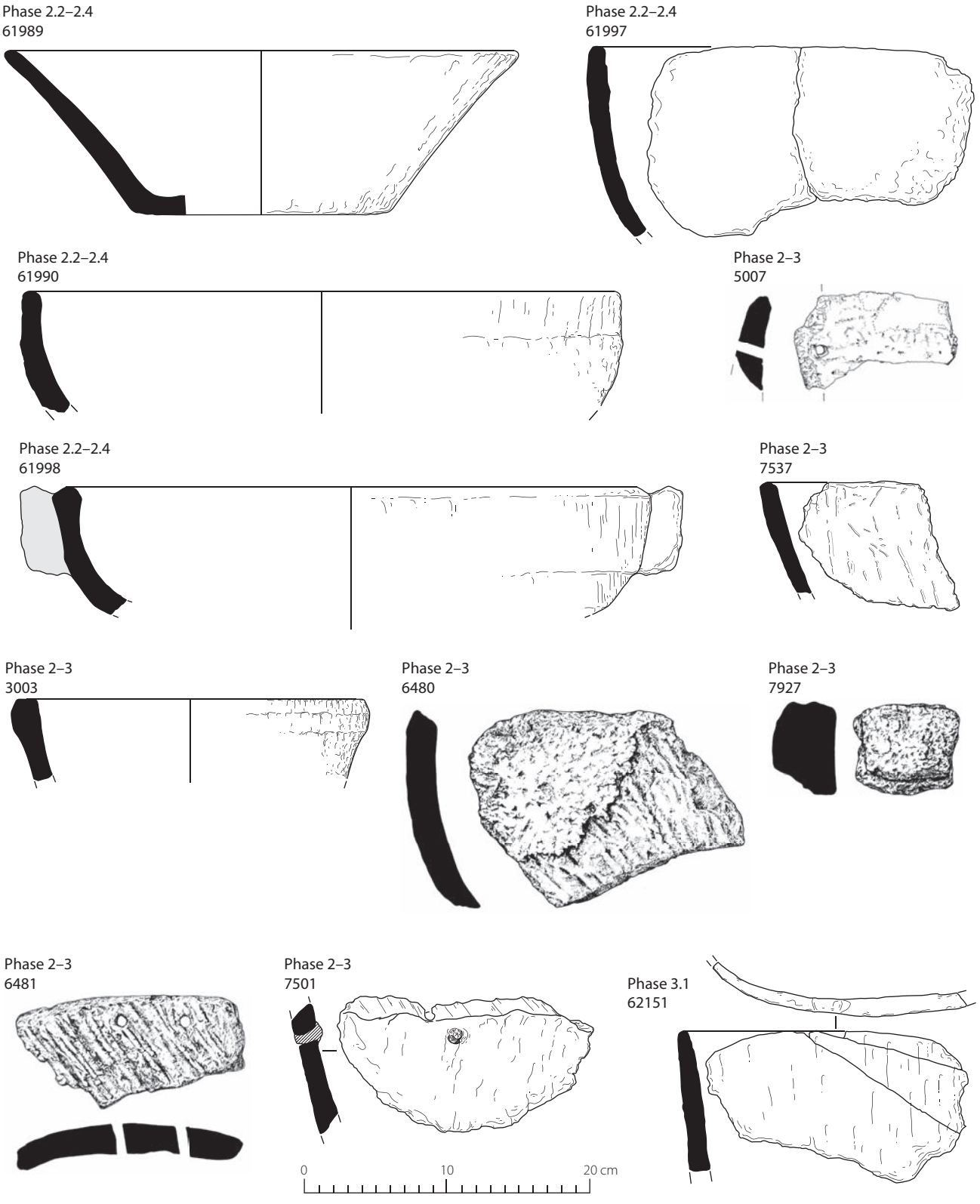

Figure 12.6. *A selection of the 111 steatite vessel sherds from Quoygrew. (Image: Vicki Herring, Jill Sievewright and Dora Kemp.)*

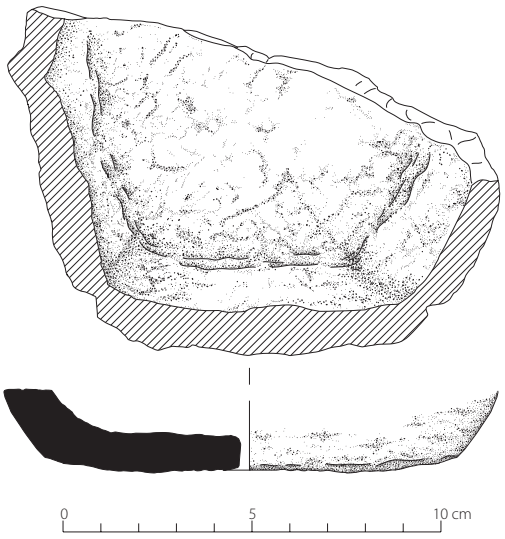

Figure 12.7. *Base of four-sided vessel (Sf. 60672) from a floor-levelling context of Phase 4.2.1 in Room 2 of House 1. (Image: Vicki Herring.)*

tive tooling — most commonly on the interior face using a narrow chisel. Often the grooving is at a slight angle to the rim, as observed on Sf. 62158 of Phase 3.1 and Sf. 60909 of Phase 4.1. In some examples (e.g. Sf. 6481 of Phases 2 to 3) there are signs of herringbone-like internal grooving.

The four-sided vessels recovered from Quoygrew provide a good example of the range of forms that can fall within this category. Previous work has identified two main types of four-sided vessels: large subrectangular pots with subrounded corners and a thinner-walled form which better fits the description 'square vessel'. Examples of both variants have been recovered widely across Atlantic Scotland where four-sided vessels remained the dominant form from their development during the ninth and tenth centuries through to the demise of using steatite as a material for pots in the region — probably in the fourteenth to fifteenth centuries based on the Quoygrew evidence (see also Forster 2006; 2009a). Examples of this form have also been recorded in the Faroe Islands (Forster 2004b).

Both thick-walled and thin-walled examples of the four-sided form are present in the Quoygrew assemblage. The former have wall thicknesses ranging from 18 mm to 25 mm, (or up to 30 mm at the wall to base angle). Thin-walled examples have thicknesses ranging from 12 mm to 17 mm and tend to be better made. Good examples include Sf. 7537 from Phases 2 to 3 and Sf. 61997 from Phase 2. However, the most significant example is a group of sherds (Sf. 60672) forming the lower part of such a vessel, recovered from the floor of Room 2 in Phase 4.2.1 (see Figs. 4.38 & 12.7). This vessel marks the end of steatite vessel use at Quoygrew, on the assumption that the few later finds are residual. As noted in Section 12.2.2 above, Sf. 60672 forms part of a levelling deposit, along with other stones, and may be residual itself. In this case the active use of steatite vessels at Quoygrew may have been restricted to Phases 1 to 3.

There are a number of parallels for square vessels in the Northern Isles, including Pool (Smith & Forester 2007, 432) and Tuquoy (Sharman 1990, cited in Smith *et al*. 1999, 132) in Orkney and The Biggings (Smith *et al*. 1999, 131–2), Jarlshof (Hamilton 1956, 165–6), Old Scatness (Forster 2010) and Sandwick South (Bigelow 1985, 107) in Shetland. Square vessels were once thought much later in date than hemispherical pots (Forster 2004a and references therein), but they have now been recognized in contexts dating as early as the tenth century at Pool (Smith & Forster 2007, 432). Nevertheless, they clearly continued to be produced well into the Middle Ages — as demonstrated by the finds from The Biggings, Sandwick South and now Quoygrew.

12.2.6. Bucket-shaped steatite vessel

Find 61989 is a large section of a vessel which has a flaring wall and a flat base (see Fig. 12.6). The profile is complete, including the rim. It could represent either a bucket-shaped form or one end of a larger oval vessel. Sharman (1999, 171–2) has recognized oval vessels at Kebister in Shetland, noting Viking Age parallels, but in these cases the pots were clearly round-based. The Quoygrew example has more affinity with the 'flowerpot' form identified by Smith *et al.* (1999, 132) at The Biggings and flat-based vessels known from Bergen (Vangstad 2003). However, these parallels are later in date than Phase 2 at Quoygrew, to which Sf. 61989 is attributed. It is possible that the context from which the find came, F785, has been incorrectly phased. This layer is immediately south of Room 3, and could thus relate to disturbance during the building or maintenance of this room in Phase 3 — rather than being contemporary with the underlying House 5 as thought during analysis of the stratigraphy (Chapter 4). However, other possible examples of the type were recovered from Norwick — which is thought to have an early Viking Age date (Forster unpublished; Ballin Smith 2007). This form is very rare in Atlantic Scotland. It is here tentatively interpreted as a Norwegian import.

12.2.7. Indeterminate steatite fragments

Small fragments, chips and flakes of steatite were scattered through all parts of the site and most phases. None indicate the finishing of pots and almost all probably derive from broken vessels (as indicated by

the presence of sooting and/or tooling on some) or from reworking of vessels. The recovery of so many small pieces is the result of the sieving programme rather than being indicative of large-scale working of steatite on site.

Some reuse and refashioning of pieces can be observed (see below), but not enough to imply careful curation of this imported medium — in contrast, for example, with finds recovered in Iceland where supply was far more limited (Forster 2004b; 2009b). Steatite must have been in satisfactory supply during the phases in which it was desirable. The identification of two unworked lumps, one from Phase 1.2 (Sf. 7896) and the other from Phases 2 to 3 (Sf. 70013), may represent the presence of raw material which, although minor in scale, is significant. All other finds represent the import or recycling of finished items.

12.2.8. Steatite spindle whorls and weight

Twelve steatite spindle whorls were recovered at Quoygrew (Table 12.3; see Fig. 12.8). Five were clearly made from reused vessel sherds. These include Sf. 61108 from Phase 2, Sf. 7089 from Phases 2 to 3, Sf. 61995 from Phase 3.2, Sf. 10024 from Phases 3 to 4 and Sf. 61708 from Phases 4 to 5. Find 10024 is probably manufactured from an imported thin-walled Norwegian vessel of very fine-grained steatite. Most of the remaining whorls probably also represent reworked material. Two whorls were unfinished and three had eccentric perforations. One of the partly made examples (Sf. 61108 from Phase 2) appears to have been lightly marked with incisions that were probably intended to include a cross and arc on one side, despite being early in the manufacture process. Almost all of the whorls were discoidal or irregular, essentially reflecting the thickness of the vessels from which they were made. However, Sf. 7955 from Phases 2 to 3 is bun-shaped and may have arrived at Quoygrew as a finished item (see Hansen 2005, 195 for examples from Bergen). The finished and undamaged whorls range in weight from 15 g to 36 g. Spindle whorls of other raw materials are considered in Section 12.3 below and in Chapter 13.

Only one probable fishing weight of steatite was recovered from Quoygrew, and it was unfinished (having been lost or discarded before being perforated) (see Fig. 12.9). This is consistent with a general trend in which Orcadian weights are of other kinds of stone (see below), whereas Shetlandic and Norwegian examples are typically manufactured from steatite (e.g. Bigelow 1985, 119; Olsen 2004, 35; Sørheim 2004, 119). The Quoygrew weight (Sf. 6557) was a reused vessel sherd, oval in shape, with a burnt exterior, grooved tooling on the interior, and a slightly curving profile.

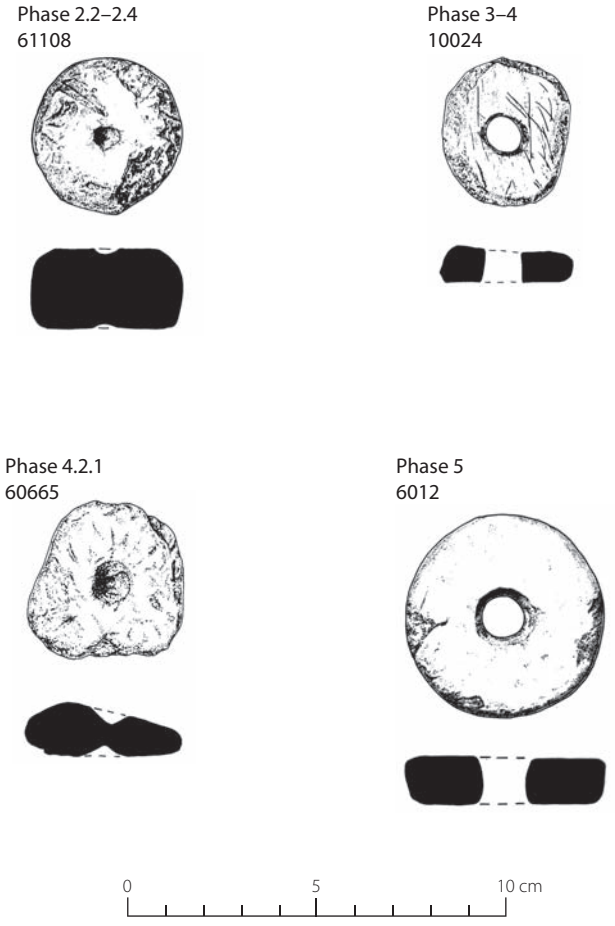

Figure 12.8. *A selection of the 18 stone spindle whorls from Quoygrew: Sfs. 61108 and 10024 are of steatite, Sf. 60665 is of mica schist and Sf. 6012.2 is of sandstone. (Image: Caitlin Evans and Dora Kemp.)*

Weighing 81 g, it is approximately 75 mm long and, 35 mm wide. It probably represents a weight for 'trolling', when a fishing line is dragged through the water at a relatively shallow depth (Sørheim 2004, 119). It was found in Room 1, from a poorly stratified Phase 4 context.

12.3. Spindle whorls and weights of other stone

In addition to the steatite examples, six stone spindle whorls (one found as two pieces, Sfs. 61984 and 61985) and eight or nine stone weights were found at Quoygrew (Table 12.3; see Figs. 12.8 & 12.9). Five of the whorls are made of local stone, mostly with eccentric perforations and rough edges. The sixth (Sf. 60665 from Phase 4.2.1) is also roughly shaped (and incomplete, with two partially drilled holes). However, it is made of a pale silvery grey mica schist that is not local to Orkney. It probably represents the reworking

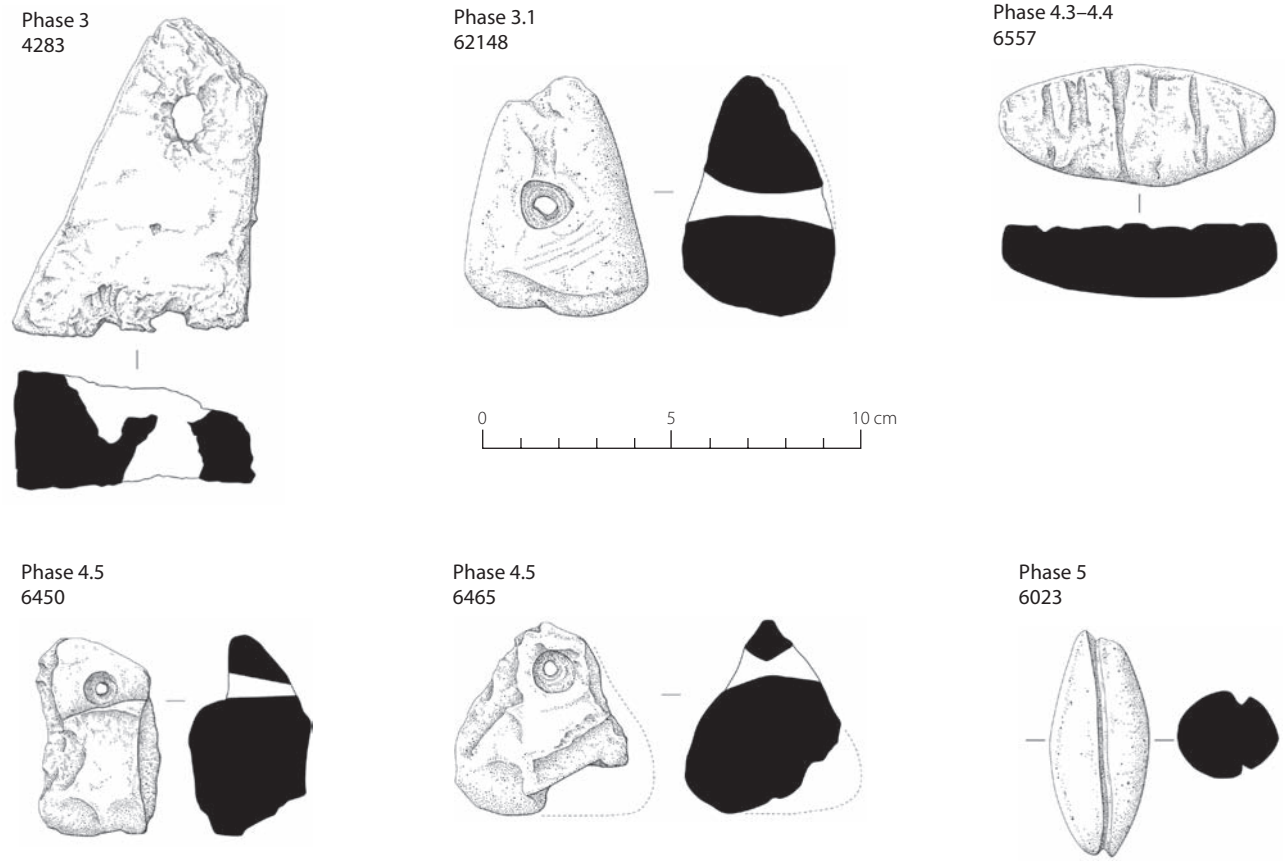

Figure 12.9. *Probable fishing weights from Quoygrew. Sf. 6557 (unfinished) is recycled from a steatite vessel sherd. The rest are of local stone. (Image: Caitlin Evans, Vicki Herring and Dora Kemp.)*

of stone imported in the form of querns (see below). Although the numbers are very small, these six spindle whorls have a later chronological distribution than the steatite examples. Only one (Sf. 61577) is attributed to Phase 3, and it is from a disturbed context. The other five are from Phases 3 to 4, Phase 4 and Phases 4 to 5. Conversely, seven of the 12 steatite whorls were from Phases 2 and 3.

Two of the stone weights (Sfs. 62120 and 62147) were made of mica schist. Both are flattened ovals with central perforations — a form interpreted as evidence for use as warp-weights on an upright loom. Based on their shape and raw material they probably represent reused fragments of imported quern stone (see below). Find 62120 (of 616 g) is of pale to medium grey schist, finely crystalline (almost phyllite in places), consisting of moderately foliated muscovite with abundant small (less than 1 mm wide) black mineral, probably of hornblende type. After being used as a loom weight it served a tertiary function as a pivot stone (see below for pivot stones of other raw material), presumably for a door, until it was ultimately discarded in a late (Phase 4 to 5) midden fill of Room 3.

Find 62147 (of 482 g) is of pale silvery grey schist, medium to (less commonly) coarsely crystalline, consisting mainly of well-foliated muscovite, with a few small (up to 3 mm wide) dark grey masses that look like weathered garnet but are too soft (being only *c.* 4 on Moh's Scale, as distinct from 6.5 to 7.5 for garnet). There is also a magnetic mineral that is too minute to identify, but is almost certainly magnetite. This loom weight was recovered from Phase 3.1, the demolition of House 5 prior to the building of Room 3.

A third weight, Sf. 62152 of 6.9 kg, was also found in Phase 3.1. It may have served as a weight to secure simmens (ropes for retaining thatch) on the roof. However, given that only one was found an alternative use (perhaps as a boat anchor or counter-balance) is equally likely. This object, of local stone, is unlikely to be a fishing weight as the heaviest line and/or net weight from Borgund in Norway is 3.55 kg and it is an exception (Sørheim 2004, 122).

Find 6023 is a finely worked lenticular weight with a complete medial groove around its long axis rather than a perforation. Its dimensions are 60 × 28 × 23 mm and its mass is 64 g. Found in a disturbed

context of Phases 4 to 5, it may be residual from earlier occupation. A broken weight from Phase 3.1 (Sf. 62148) may originally have been similar in form, but with a perforation near the surviving end rather than a medial groove. It is also of much greater size (being 216 g in an incomplete state). The lighter example was possibly intended for trolling (see above), or for fishing in shallow water, whereas the heavier one could represent a weight for deep bait hand lining — in which bait and hook need to be dropped rapidly to a desired depth (Sørheim 2004, 119–21). Three other perforated stones represent more expedient weights: Sf. 4283 (138 g) from Phase 3, Sf. 6450 (90 g) from Phase 4.5 and Sf. 6465 (107 g) from Phase 4.5. All are broken, probably during manufacture. It is highly likely that they were also intended for line fishing. Lastly, a find of local sandstone with an incomplete perforation (Sf. 6451, weighing 305 g) may have been intended to be a weight or a hone. It is discussed further below.

12.4. Schist bake stones

Find 6631 (from the fill of a side bench built in Room 1 during Phase 3.4) is a substantial part of a thin circular schist bake stone of distinctive Norwegian type (Fig. 12.10). It is double-scored on one face and single-scored on the other. Unusually, it seems to have had a perforation at one edge. Find 61621 (from the floor of Room 1 in Phase 3.4) is not obviously from the same plate as Sf. 6631 and probably represents a second object. It has traces of deep incisions.

The thickness, style of finishing and raw material of these bake stones is characteristic of known quarries in the Hardanger region of western Norway. This type of Norwegian import is extensively discussed by Weber (1999, 134–9) in relation to similar finds from the medieval site at The Biggings in Shetland. Hardanger bake stones are also known from Jarlshof, Sandwick South and Kebister in Shetland and from Tuquoy in Orkney (Weber 1999, 138). Schist bake stones first appeared in Norway itself around 1100, and were soon exported across the Scandinavian North Atlantic (Weber 1999, 137–8). At Freswick Links in Caithness, however, there are no baking plates at all in the assemblage (Batey 1987, 231). This geographical distinction may resemble that of steatite vessels – ceramic rather than soapstone pots seem to have been the norm in late Viking Age and medieval Caithness (see Chapter 16).

Thicker steatite baking plates were already in production in Shetland prior to the advent of Norwegian schist bake stones. Examples of these more local products have been found at Pool in Orkney (Smith & Forster 2007, 432), but were not present at Quoygrew.

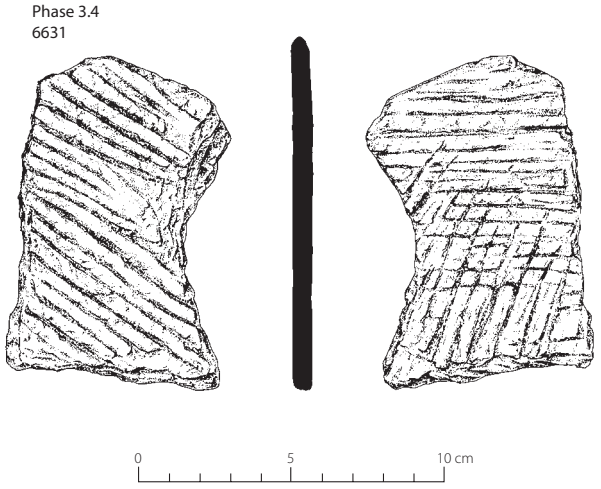

Figure 12.10. *Fragmented schist bake stone of Norwegian type. (Image: Alix Sperr.)*

Based on recent Norwegian rural custom it is assumed that baking plates were used for the production of unleavened flatbread, on which food was placed before being handed out during meals (Weber 1999, 138).

12.5. Hones of schist, phyllite and sandstone

Twenty-three hones, for sharpening iron tools, were recovered from Quoygrew (Fig. 12.11; Table 12.3). All were examined optically by one of the authors (Geoff Gaunt, formerly of British Geological Survey) who was of the opinion that 14 were undoubtedly of Eidsborg schist (also known as Norwegian ragstone or light grey schist), one was probably of Eidsborg schist, one was probably of purple phyllite (also known as blue phyllite or dark grey schist) and seven were of sandstone. Thin-section analysis, by Fiona Breckenridge and Judith Bunbury, was also conducted on three of the hones identified as 'definite' Eidsborg schist and one as 'probably' Eidsborg schist in order to confirm whether or not this group of material was indeed imported from Norway. It has been previously suggested that, without the benefit of thin sections, Eidsborg schist can be difficult to differentiate from the Dunrossness Phyllites of Shetland (Crosby & Mitchell 1987, 502).

Eidsborg schist is almost invariably a pale silvery grey, fine to medium crystalline, well-lineated but only poorly foliated, quartz-muscovite schist. It consists predominantly of parallel lines of quartz crystals (like beads on straight lengths of string), which give the impression of very thin parallel glassy rods (like pencils in a narrow box), hence the term lineation. The only other mineral that is commonly detectable with the naked eye is muscovite, the flakes

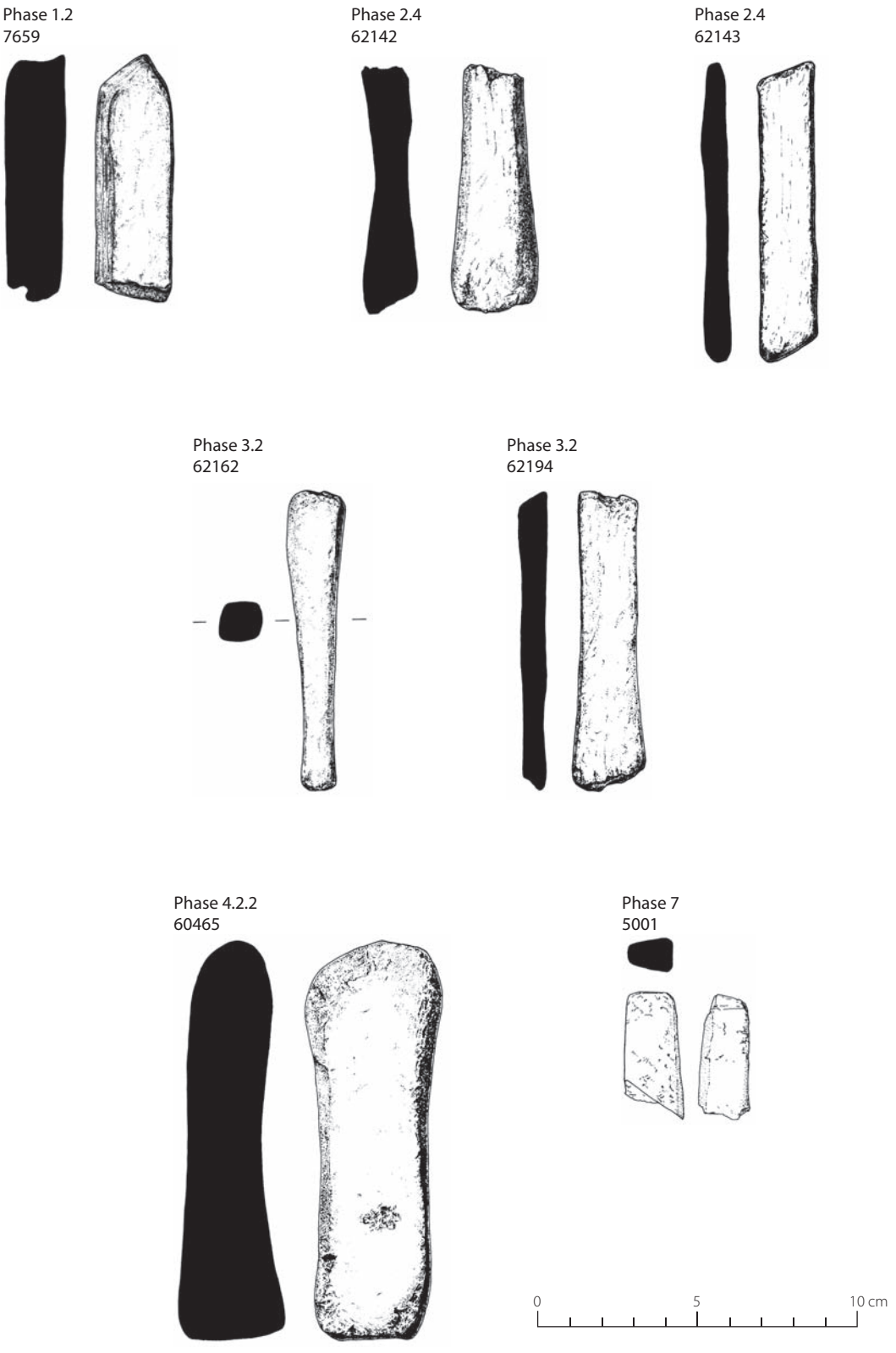

Figure 12.11. *A selection of the 23 hones from Quoygrew. Sf. 7659 is probably of purple phyllite. Sfs. 62142, 62143, 62162 and 62194 are of Eidsborg schist. Sfs. 5001 and 60465 are of local sandstone. (Image: Vicki Herring and Dora Kemp.)*

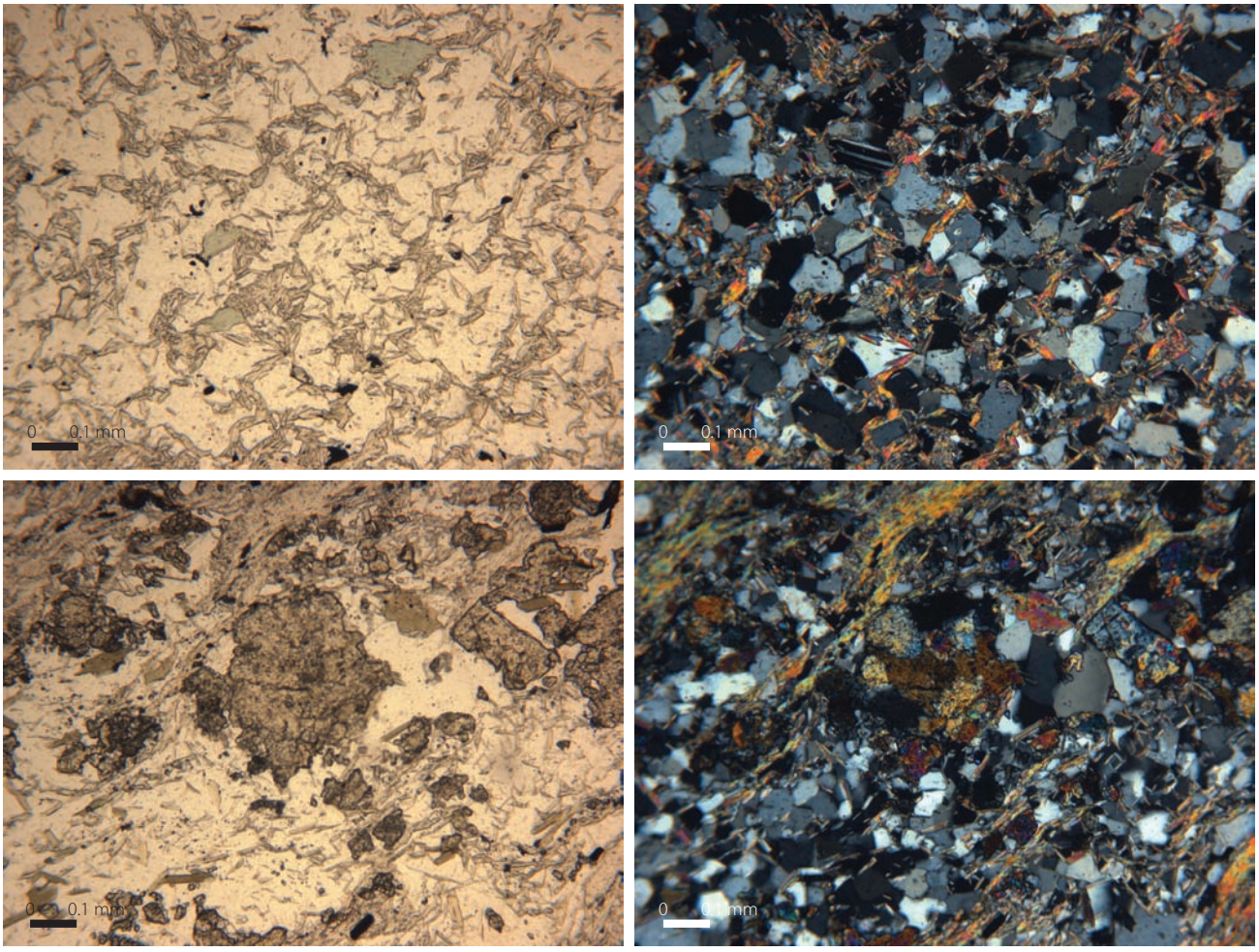

Figure 12.12. *Micrographs of thin sections from Eidsborg quarry samples Eid A (top row) and Eid B (bottom row) in plane- (left) and cross- (right) polarized light. (Image: Fiona Breckenridge and Judith Bunbury.)*

of which have mutually parallel planes. It is, however, insufficiently abundant to produce other than a vague foliation.

The 14 hones identified here as of Eidsborg schist are absolutely typical of this lithological type and although a few (notably Sfs. 61626, 61627 and 62133) are slightly more coarsely lineated than the rest they are still within the medium crystalline texture range of this schist. Previous research, based on thin-section petrology, potassium-argon dating and rubidium-strontium dating, has narrowed the source of the type to the Eidsborg quarries of southern Norway — from which hones were widely exported across northwestern Europe in both the Viking Age and Middle Ages (e.g. Ellis 1969; Mitchell *et al*. 1984; Crosby & Mitchell 1987; Askvik 2008 and references therein; Hansen 2011).

Three examples of this lithological type from Quoygrew were thin sectioned: Sf. 6079 (Phase 4.5), Sf. 61571 (Phase 3.4) and Sf. 62133 (Phase 2.3). Find 6590 (residual in Phase 4.5 to 5), with a slightly different lithology, was also sectioned because it was originally classified as 'probably' rather than 'definitely' Eidsborg schist. The Quoygrew samples were compared with thin sections of two reference specimens collected on-site at the quarries in Eidsborg and of two samples from the Dunrossness Phyllite group. The Eidsborg samples were collected by Fiona Breckenridge and Judith Bunbury with help from Dag Rorgemoen of the Vest-Telemark Museum. The thin sections of Dunrossness Phyllite (from Dunrossness and Scousburgh in Shetland) were kindly supplied by Roy Fakes of the British Geological Survey.

One can compare the petrographic properties of the sections in Figures 12.12 to 12.15 and Table 12.6. There is clear concordance between three of the Quoygrew finds (Sfs. 6079, 61571 and 62133) and the two specimens collected from Eidsborg (A and B).

Table 12.6. *Descriptions of thin sections of reference samples of Eidsborg schist and Dunrossness Phyllite, and of four hones from Quoygrew.*

Sample	Quartz (percentage of sample and average diameter of grains)	Muscovite (percentage of sample and average size of grains)	Chlorite/ biotite	Epidote	Opaque minerals	Other
Eid A (Eidsborg quarry)	90% 0.1 mm	5% 0.2 mm-long needles arranged in grid formation	2% chlorite sparse biotite	1%	1%	Extremely rare plagioclase. Very rare feldspar. Extremely rare orthoclase. Sparse calcite.
Eid B (Eidsborg quarry)	50% 0.2 mm	40% 0.2 mm-long needles arranged in grid formation	2% chlorite trace biotite	10%	1%	Banded. Some mica rich bands, some epidote rich bands. Strong crenulation cleavage.
6079 (Quoygrew)	90% 0.1 mm	6% 0.2 mm-long needles arranged in grid formation	1% chlorite	1%	1%	Extremely rare plagioclase. Rare orthoclase. 2% calcite.
61571 (Quoygrew)	85% 0.1 mm	5–10% 0.2 mm needles arranged in grid formation	2% biotite	1%	1%	Rare plagioclase. Rare orthoclase.
62133 (Quoygrew)	90% 0.1 mm	5–10% 0.2 mm needles arranged in grid formation	2% biotite trace chlorite	2%	1%	Rare plagioclase. 1% calcite.
6590 (Quoygrew)	15–20% 0.05–0.5 mm	15–20% 0.2 mm long needles arranged in grid formation	1% chlorite 1% biotite	1%	1–2%	Bimodal distribution of grains. 2–3% calcite. One very small zircon grain. Sparse plagioclase. Sparse feldspar.
12404 (Dunrossness phyllites)	60% 0.5 mm	30% Crenulated texture	10% chlorite	none	Magnetite up to 0.3 mm	
27141 (Dunrossness Phyllites)	60% 0.05–0.5 mm	30% Strong cleavage. Strongly aligned and no grid formation	10% chlorite stronger cleavage than in Eidsborg samples	trace	Magnetite up to 0.5 mm	

The thin section of the fourth Quoygrew hone (Sf. 6590), originally classified as 'probably' rather than 'definitely' Eidsborg schist, exhibited slightly different petrology. For example, it had a higher percentage of muscovite and a lower amount of quartz than the other Quoygrew samples. Conversely, the two Dunrossness Phyllite samples exhibited considerably different petrology from all of the Quoygrew and Eidsborg samples. In particular, they contained magnetite and a greater amount of chlorite. Overall, these comparisons are consistent with the interpretation that the Eidsborg and Quoygrew samples share a source (with the possible exception of Sf. 6590). None of the Quoygrew stones shows concordance with the Dunrossness Phyllite samples.

Hones from the Eidsborg quarries were exported via Skien in southern Norway (Myrvoll 1982; Resi 2008, 65–6), but also travelled to western Norway. Thus their appearance at Quoygrew may relate to Orcadian trade with centres such as Bergen, where they first appeared in Hansen's Horizon 3 (*c.* 1070–*c.* 1100) and became common by her Horizon 5 (1120s–*c.* 1170) (Hansen 2005, 210–17).

Most of the Quoygrew hones of Eidsborg schist were originally bar-shaped, with square or rectangular sections. The one exception (Sf. 62133) had a 'D'-shaped cross-section. Continual use led to the thinning of the central part of the objects and frequently also to breakage (Fig. 12.11). Thus few of the finds were complete and all were small. The largest (Sf. 61626 from Phase 3.3) was 215 mm long, but most were closer to 100 mm — albeit in a broken state. Their maximum thicknesses ranged from 13 mm to 31 mm. One hone (Sf. 61538, from Phase 3.5) was crenelated at one end, perhaps to facilitate a specialized sharpening function. None were perforated or grooved for suspension. The find classed as probably of Eidsborg schist (Sf. 6590 from Phases 4 to 5) is similar in both size and shape to the more definitive examples.

None of the Eidsborg hones were from midden contexts, perhaps implying that they were typically lost rather than discarded. Five of the Eidsborg hones are from Phase 2, all from the floor of House 5 (Table 12.5). Seven are from Phase 3, most of which are from the floor of Room 1. A single specimen (Sf. 6079) from demolition rubble in Phase 4.5 is probably residual, as is a single topsoil find (Sf. 6219). The 'probable' Eidsborg hone (Sf. 6590), from a demolition context of Phases 4 or 5, may also be residual.

Find 7659 was a small broken phyllite hone, 78 mm long and 27 mm by 17 mm across. It is medium grey and very finely to finely crystalline, consisting mainly of well-lineated quartz with subsidiary moderately foliated muscovite, and has a pale green short thin rod-like mass on one edge. This rod-like mass has a lineated texture parallel to the rest of the item and a hardness of approximately 7 on Moh's Scale, suggesting that it too consists mainly of quartz. Its pale green colour is suggestive of finely disseminated chlorite between the quartz. Except for the pale-green mass the lithology of this item is identical to a category of widely traded hones variously described as purple phyllite, blue phyllite or dark grey schist (Askvik 2008, 7 and references therein). Ellis (1969, 145) noted chlorite in some purple phyllite hones, but one of us (Geoff Gaunt) has not previously seen such a sharply defined green mass in other examples of the type. Thus this item is best referred to as probably purple phyllite.

Purple phyllite hones are common finds from Viking Age sites across northwestern Europe (e.g. Crosby & Mitchell 1987; Resi 2008, 57–66; Hansen 2011). Based on potassium-argon dating the type has been attributed to rocks of Caledonian age, limiting the likely sources to Norway, Scotland, Ireland or Greenland (Crosby & Mitchell 1987). However, based on the widespread archaeological association of hones of purple phyllite and Eidsborg schist a source or sources in western Norway is most probable (Crosby & Mitchell 1987; Askvik 2008, 7–8).

The paucity of purple phyllite hones from Quoygrew is likely to have a chronological dimension. The type co-occurs with Eidsborg schist in both Britain and Scandinavia until the eleventh century, after which only Eidsborg products are common (Crosby & Mitchell 1987, 489–90; Resi 2008, 57–66). It is thus relevant that Sf. 7659 is from Phase 1.2, whereas all the well-stratified Eidsborg hones are from Phases 2 and 3 as noted above.

Hones of purple phyllite and Eidsborg schist have been recognized from other Viking Age sites in Atlantic Scotland. Examples include the Brough of Birsay, the Brough Road and Pool in Orkney (Crosby & Mitchell 1987, 490; Batey 1989, 211; Breckenridge 2009), Jarlshof in Shetland (Breckenridge 2009), and Bornais (Sharples pers. comm.), Cille Pheadair (Parker Pearson *et al*. 2004a, 247) and Ardvonrig (Crosby & Mitchell 1987, 490) in the Western Isles. Hones from other sites in the Northern Isles (e.g. Clarke 1999, 160) merit further study in view of the possibility that some may also represent imported Norwegian purple phyllite and Eidsborg schist. However, it is important to recognize that alternative sources of metamorphic stone from Shetland were probably also used (Crosby & Mitchell 1987, 502; Ballin Smith & Allen 1999, 180–82).

Seven other probable hones from Quoygrew are entirely consistent with the Middle Devonian Rousay Flags which crop out on Westray and underlie the site. These local products began to complement Eidsborg schist examples in Phase 3 and probably completely replaced them in Phase 4. Of the seven finds, two are bar-shaped specimens — one heavily used — that were clearly hones (Sfs. 5001 and 60465). A third is a flat oval grinding slab (cf. Resi 2008) with extensive evidence of use for sharpening (Sf. 60561). A forth specimen (Sf. 6451) is also bar-shaped (and exhibits an abortive attempt to drill a perforation at one end), but has no evidence of wear. It may represent an unused hone or weight discarded during manufacture (see also Section 12.3 above). Three final specimens (Sfs. 61455, 61683 and 62184) are bar-shaped stones with slight traces of wear. Their identification as hones is tentative. Finds 6451, 60465 and 60561 were also used as pounders, being battered at one or both ends. Find 5001 is broken, but the complete examples vary in length from 105 mm (Sf. 61455) to 175 mm (Sf. 60561). Excluding the irregular grinding slab, they vary in maximum thickness from 16 mm to 42 mm.

12.6. Querns and other objects of mica schist

Several fragments of rotary hand querns were made of a distinctive pale grey schist (consisting mostly of well-foliated muscovite) that is not local to Orkney, but is different from that used for the hones and bake stones from Quoygrew. A few additional objects (including a spindle whorl and two loom weights noted above, and two stone discs discussed below) of the same raw material may represent the recycling of broken fragments of similar querns. Forty-seven finds of small chips of mica schist suggest that this stone was worked in some way in all phases of occupation (Table 12.3).

Two definite quern fragments (Sfs. 60707 and 61565) are both of pale silvery grey schist, fine to

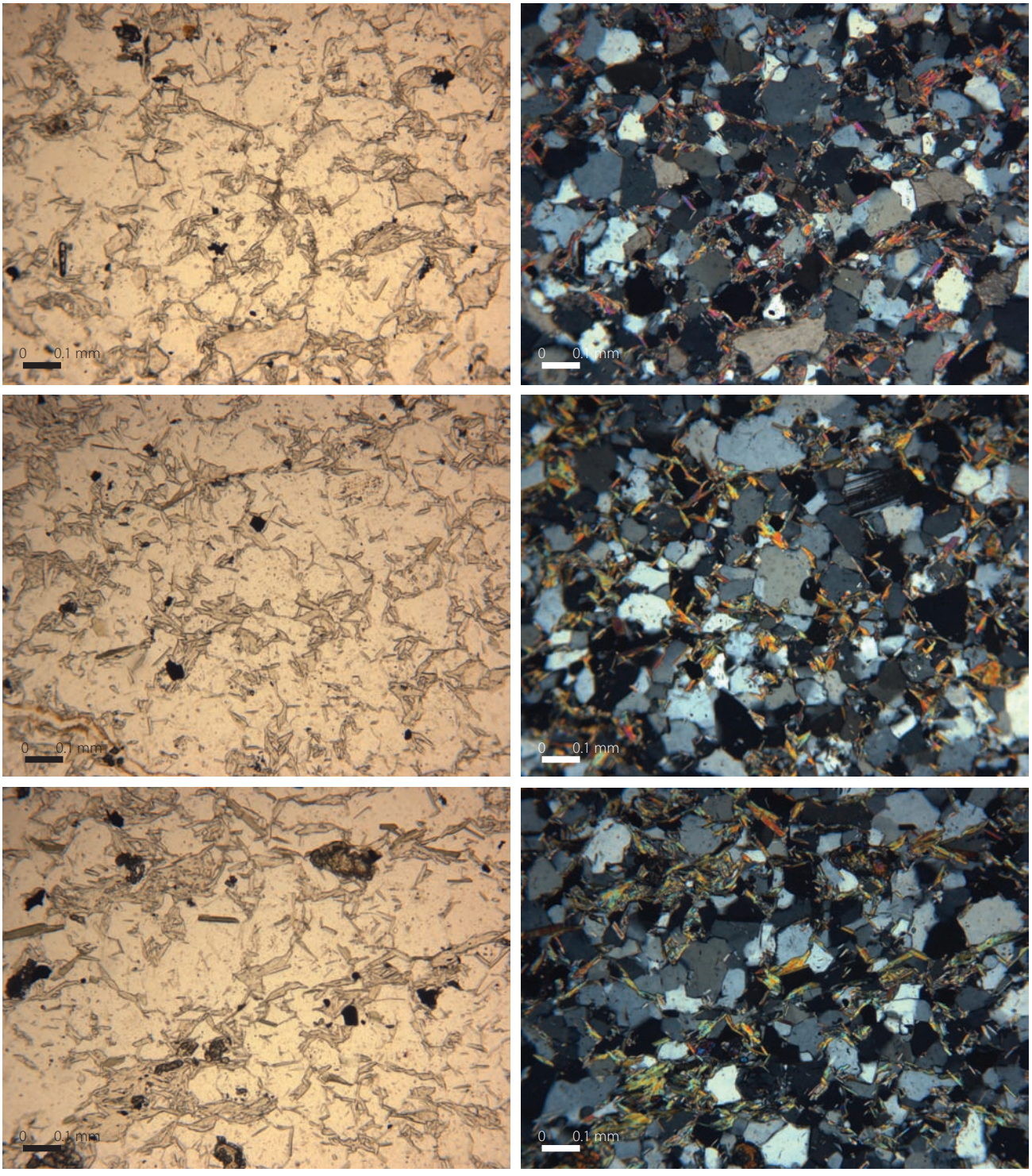

Figure 12.13. *Micrographs of thin sections of Quoygrew hones 6079 (top row), 61571 (middle row) and 62133 (bottom row) in plane- (left) and cross- (right) polarized light. (Image: Fiona Breckenridge and Judith Bunbury.)*

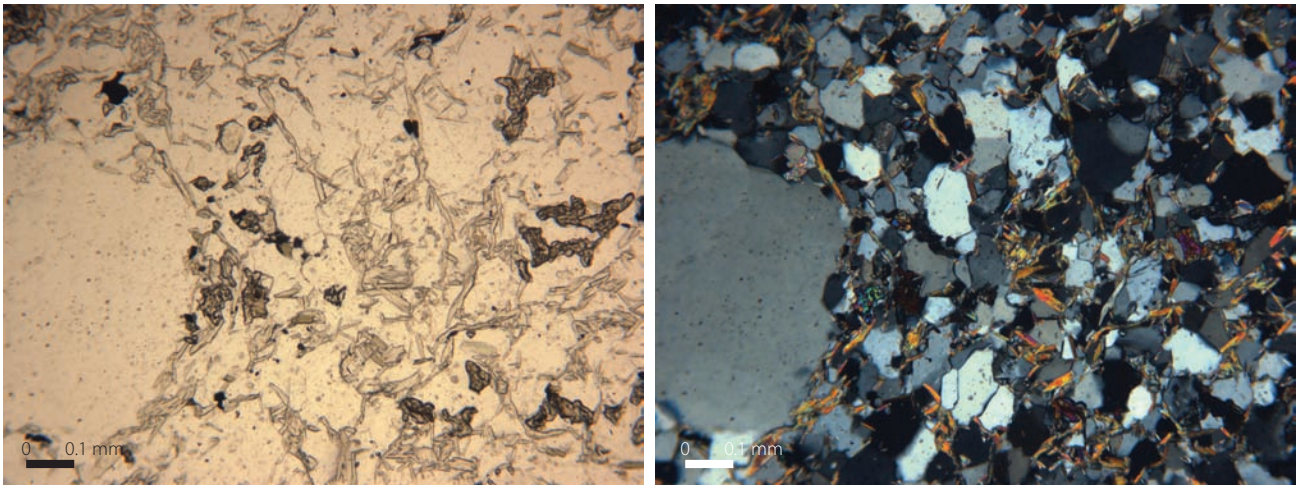

Figure 12.14. *Micrograph of thin section of Quoygrew hone 6590 in plane- (left) and cross- (right) polarized light. (Image: Fiona Breckenridge and Judith Bunbury.)*

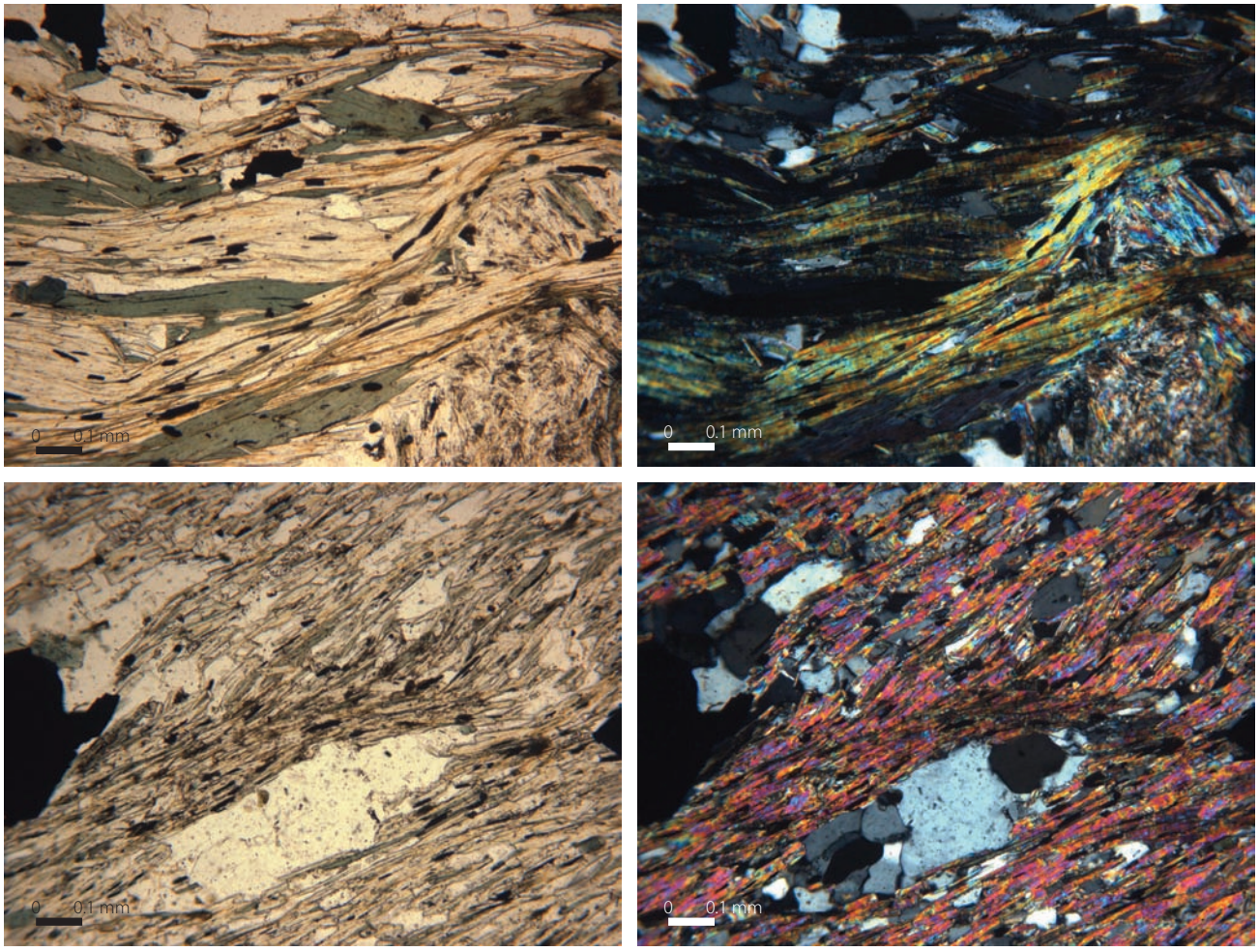

Figure 12.15. *Micrographs of thin sections of Dunrossness Phyllite samples 12404 (top row) and 27141 (bottom row) in plane- (left) and cross- (right) polarized light. (Image: Fiona Breckenridge and Judith Bunbury.)*

(mainly) medium crystalline, consisting of well-foliated muscovite, with appreciable small (up to 3.5 mm) greyish-pink garnet, a few finely crystalline masses of a black prismatic mineral (probably of hornblende type) and sparse probable quartz. Find 61565 has one grinding face visible and has been subject to heavy use. It was found in the fill of the side bench constructed in Room 1 during Phase 3.4. Find 60707 was a section of an upper(?) stone with traces of a large central perforation and extensive wear. It had been reused in a Phase 4.2.1 context as part of the curb inside a secondary entrance added to the north wall of Room 2.

An incompletely manufactured disc (Sf. 60934 from Phase 4.2) has been fashioned from raw material identical to that of Sf. 60707. If completed it would have had a diameter of *c.* 100 mm, and may possibly have been intended as a pot lid. Another fragment of mica schist (Sf. 61635 from Phase 3.3) has been roughly worked into a smaller irregular disc 60 mm in diameter and 14 mm thick. It is made of slightly different material: pale to medium silver grey schist, medium crystalline, consisting mainly of well-foliated muscovite with some probable biotite and a magnetic mineral, almost certainly magnetite. A fifth find (Sf. 60562, from Room 2 in Phase 4.2.1) is probably a quern fragment, but lacks an intact worked surface. It is made of mica schist identical to that used for loom weight 62147 described in Section 12.3 above.

There are metamorphic rocks in Orkney, but they are lithologically quite unlike any of the items noted here. The feasible sources for these mica schists include Norway, Shetland, the Scottish Highlands and the Western Isles. Quern stones of garnetiferous mica schist have been recovered from other Viking Age and medieval sites in the region. Examples include Jarlshof in Shetland (Hamilton 1956, 182) and Freswick Links in Caithness (Batey 1987, 162–3, 183–4). Large-scale Viking Age and medieval quarrying for export is known from Norway (at Hyllestad north of Bergen, for example) which may thus be the origin of some or all of this material (cf. Baug 2005; Grenne *et al.* 2008).

12.7. Possible querns of sandstone

Two objects of sandstone may also have been querns. Find 7079 from Phase 6 is a saddle quern made from a large beach cobble and is of typical prehistoric form. It is likely to be residual in the context from which it was recovered, and was probably introduced to the site as building stone. Find 61642 from a Phase 3.2 floor layer in Room 1 is difficult to interpret. It may be part of a small sandstone quern with an hour-glass perforation.

12.8. Pounders and anvils

Nineteen simple sandstone pounders (with evidence of battering on one or both narrow ends, and occasionally also on other surfaces) were recovered from Quoygrew (Table 12.3). These are in addition to the three possible sandstone hones noted above that were also employed as pounders. All are simple beach pebbles of local origin. There is one find from Phase 1.2 (Sf. 70117), five from Phase 3 (Sfs. 61457, 61458, 61687, 61967 and 62201), one from Phases 3 to 4 (Sf. 61846), seven from Phase 4 (Sfs. 6390, 6469, 60531, 60692, 60731, 60748 and 60891), one from Phases 4 to 5 (Sf. 61773) and four from topsoil or other unstratified contexts (Sfs. 69, 4007, 60540 and 60757). Many are from floor layers of Rooms 1 and 2. Thus their absence from Phase 2 (which is represented mostly by floors, from House 5) may be meaningful in chronological terms. It is conceivable that hones of Eidsborg schist fulfilled both pounding and sharpening functions in this earlier phase.

Multi-functional stone tools like the sandstone pounders from Quoygrew are ubiquitous finds in pre-Viking Age contexts from the Northern Isles (Clarke 2006, 45–6). They can be readily paralleled, for example, at St Boniface in Orkney (Clarke 1998a, 133–5) and Scalloway in Shetland (Clarke 1998b, 140–44). However, the form of these objects is probably too simple to suggest that their use implies the retention of an indigenous Pictish technology — particularly given their absence from Quoygrew during Phase 2. One purpose to which they may have been put is the removal of limpets from the stony foreshore — which requires some force.

In addition to the pounders discussed above, two stones from Quoygrew clearly served as anvils of some kind (Sfs. 60455 and 60449). They were found adjacent to each other, embedded in the floor of Room 2 during Phase 4.2.2 (when this space had been reconfigured as a workshop) (see Fig. 4.39). Find 60455 is roughly spherical whereas Sf. 60449 is a flatter oval. It is impossible to suggest the specific purposes to which they were put, but Sf. 60455 in particular is heavily pecked on its upper surface. Two further stones (Sf. 6385 from Phase 4.4 and Sf. 6566 from Phases 4.3 to 4.4, both in Room 1) may also have served as anvil stones based on wear. Both are smaller, perhaps portable, objects that were not found *in situ*.

12.9. Pumice

There are 22 finds of pumice, spread through most phases of the site (Table 12.3). The ultimate source of this material is almost certainly Iceland, but all of

the Quoygrew finds are water-worn and thus they were probably picked up from the adjacent seashore rather than purposefully imported. Find 61879 from Phase 4 is a partially perforated float (discarded in an unfinished state), presumably for line or net fishing. Six other pieces of pumice appear to have been utilized for smoothing: Sf. 62241 from Phase 2.2, Sf. 7971 from Phases 2 to 3, Sf. 60915 from Phase 4.2, Sf. 4168 from Phases 4 to 5, Sf. 61863 from Phases 4 to 5 and Sf. 60409 from Phases 5 to 6. It is important to note that, unlike layers of volcanic tephra, the presence of such material in a context is not a chronological marker, since pumice is readily available on nearby beaches and could have been used for any activity requiring an abrasive or a float. The incomplete nature of Sf. 61879 reinforces the view that this is expedient use of a local resource. Pumice is found naturally along the coasts of northern Scotland and the Northern Isles (e.g. Dugmore & Newton 1999, 167).

12.10. Flint

Forty-three finds of flint can be subdivided into unworked pieces and chips, struck pieces and flakes, a possible core (Sf. 61077 from Phase 3.5), a possible burin (Sf. 60446 from Phases 5 to 6) and a modern gunflint (Sf. 105 from unphased layer H002). An unusual piece (Sf. 6377 from Phases 5 to 6) with a glassy adhesion may simply represent the burning of the flint in a sandy matrix. Overall, the flint is scattered through the different phases and areas of the site, indicating a lack of *in situ* working. The single possible core and burin may be reused prehistoric material. Most of the other material is irregular and is likely to represent a combination of natural inclusions and the residue of fire starting using strike-a-lights.

12.11. Miscellaneous stone objects

Two pivot stones were identified (in addition to Sf. 62120, the loom weight of mica schist reused for this purpose noted above). Find 62134 was incorporated into paving of the floor of House 5 in Phase 2.3. Find 6057 was from a post-abandonment fill of Room 1 attributed to Phases 5 to 6. These objects were almost certainly structural elements that served as swinging mechanisms for doorposts or similar. Two further finds, Sfs. 61698 and 61914, were also architectural features. They were perforated flagstones laid immediately inside the southwest door of Room 1 during Phase 3.2. Their function is uncertain. The holes could have held pegs, or simply helped to drain excess water from the entryway.

Find 62242, from Phase 2.2 of House 5, appears to be part of a circular stone bowl with a thick base. It has clear external tooling and internal scratches and may be an attempt to produce a bowl or lamp in a local material which was much harder to work than steatite. This piece has similarities to hollowed stones from Pool for example (Clarke 2007, 369–74). Two semi-manufactured stone discs (Sf. 6482 from Phases 2 to 3 and Sf. 6040 from Phases 4 to 5) represent the ubiquitous 'pot lids' so commonly found on sites of all periods in Atlantic Scotland. Two additional stone discs (of imported mica schist, Sfs. 60934 and 61635) have been discussed above. Lastly, a perforated flagstone (Sf. 60612) from Phase 4.3.1 of Room 2 is probably part of a broken roof 'tile'. It is from a context interpreted as roof collapse and is the first clear evidence for the use of flagstone roofing at Quoygrew. Stone roofs, covered with a layer of thatch and/or turf, were used in Orcadian architecture of later centuries (Fenton 1978, 181–90).

12.12. Discussion

Studies of style and raw material demonstrate that many of the utilitarian stone objects at Quoygrew were imported: steatite vessels, mica schist querns, schist bake stones, Eidsborg schist hones and a probable purple phyllite hone. They probably came directly from Shetland (e.g. four-sided and hemispherical steatite vessels) and Norway (e.g. hemispherical steatite vessels, Eidsborg hones, schist bake stones and perhaps mica schist querns). Other objects, such as spindle whorls and loom weights, were manufactured from the broken fragments of the above. These imports were distributed unevenly through the stratigraphy of the site. They occurred in Phase 1, were well represented in Phase 2 and then began to be replaced by local alternatives (such as ceramic vessels and sandstone hones) in Phase 3. By Phase 4 it is likely that only residual examples remained. The socioeconomic implications of this shift are explored in Chapter 16, where it is interpreted as the cumulative result of changing networks, reduced long-range trade, reduced purchasing power and shifting expressions of insular identity.