7 The Social Context of Quartz Use – Territories and On-Site Behaviour

7.1 Introduction

Where the previous sections discussed mainly geological (eg availability and physical properties) and technological matters (eg the schematic organization of quartz production), the present section deals with the social context of quartz use in Scotland. In prehistory, quartz production was an element of active societies, and below it is attempted to use the available Scottish quartz assemblages to provide information on aspects of these societies.

Investigation of the social background to quartz production is very much a matter of intra- and inter-site spatial analysis – that is, where was worked quartz found, in combination with which other finds, and where was it absent – and a meticulous recovery policy is essential to the successful outcome of these analyses. For this reason, many 'old' assemblages are not suitable research objects, as they were frequently excavated without the use of proper grid systems, or with too large or irregular grid units, disallowing the production of detailed distribution maps. An insufficient level of stratigraphical observation, or the lack of sieving, may also hamper attempts at using 'old' assemblages for the analysis of social context.

The main questions in relation to the investigation of quartz and social context are: (i) where were different types of quartz artefacts produced, used, and discarded (which sites, and which parts of individual sites), and (ii) who was involved in these various processes (age, gender, rank, etc.)? Detailed analysis of the applied operational schema, and its level of complexity, may shed light on the second question (eg 'the best technicians', 'the less talented technicians', and 'the apprentice-debutants'; Bodu *et al* 1990, 248; Pigeot 1990).

7.2 Inter-site (regional) distribution

The distribution of archaeological quartz throughout Scotland was discussed in Section 5, region by region, and it was concluded (Section 5.2.6) that, probably, the 'ordinary' quartz forms (milky quartz and the various types of saccharoidal quartz) were perceived largely in functional terms, whereas 'greasy' quartz and rock crystal may have been associated with different symbolic values.

The overall distribution of archaeological quartz corresponds well with the relative geological distribution of quartz and quartz alternatives, with quartz use dominating the north and west, as well as the Highland zone, but with quartz being almost absent in the three regions characterized by quartz-poor sedimentary rock forms (the north-eastern, central and southern parts of Scotland). In the entire coastal zone of the mainland, as well as on several of the islands in the Southern Hebrides, flint either dominates, or it is more frequent than in the immediately adjacent parts of the Scottish mainland. This is obviously a consequence of the mainly coastal distribution of Scottish flint, with flint being washed onto the beaches from submarine deposits in the Atlantic and in the North Sea (Wickham-Jones & Collins 1978; Saville 1995, fig 1; Marshall 2000a; Marshall 2000b).

The area surrounding Scotland's only inland flint source, the Buchan Ridge Gravels (Saville 1994; Bridgeland *et al* 1997), is also heavily dominated by flint, but with quartz gaining in importance at short distances to this secondary pebble source. Sites along the St Fergus to Aberdeen Gas Pipeline (FERG; Ballin forthcoming c) are mostly characterized by approximately two-thirds quartz and one-third flint, though the distance to the Buchan Ridge Gravels is negligible (located a few km outside the flint-bearing area, and no more than 5km north-east of the flint mines on Skelmuir Hill). The FERG sites are generally late prehistoric, and as mining of the Aberdeenshire inland pebble sources is assumed to be a mainly Late Neolithic/Bronze Age activity (Saville 1994, 61; Saville 1995, 366), pebble flint should have been readily available to the settlers along the pipeline. The reason not to base the lithic production predominantly on flint from the Buchan Ridge Gravels must have been either that this resource was perceived an unacceptably poor alternative (and it is generally accepted that this flint is of lower quality than most Scottish beach pebbles; Saville 1995; Bridgeland *et al* 1997), or access to the quarried flint was in some way restricted.

An analysis of the use of quartz alternatives show that, wherever acceptable alternatives were available, the proportion of quartz decreased immediately. On Shetland, where few quartz alternatives are known, quartz usually dominates the lithic assemblages completely (99–100%). Northmaven felsite could, in functional terms, have replaced quartz as a raw material for many tool forms, but apparently this resource was quarried exclusively for axes and Shetland knives, and to a lesser extent arrowheads. Practically all scrapers in this material have polished 'under-sides' revealing that they are based on axe-fragments.

On the Western Isles, plainer quartz forms were supplemented by mylonite, flint and 'greasy' quartz, which are all assumed to have been associated – possibly to varying extent – with symbolic values (Section 6.5.3). Mylonite and 'greasy' quartz seems

to have been mainly employed in the production of arrowheads (though mylonite seems to have had a slightly broader use-range), possibly as a means of group identification (cf Wiessner 1983), whereas flint may have been highly appreciated as a relatively rare resource, but probably used more widely as a raw material providing regular durable tool edges.

In the Southern Hebrides and western mainland Scotland, the situation was roughly the same as in the Western Isles, but different quartz alternatives were available. Where flint was present, it replaced quartz, and if the resources of flint were rich enough, as on Islay (McCullagh 1989; Marshall 2000a; Marshall 2000b), they replaced quartz completely. Other local quartz alternatives were Rhum bloodstone, Staffin baked mudstone and Arran pitchstone. Apart from Arran pitchstone, which appears to have been particularly valued by prehistoric people in Scotland, and which is characterized by a complex distribution pattern [Zone I: Arran (local: general use of pitchstone through all periods); Zone II: the adjacent parts of the Scottish mainland (regional: pitchstone is occasionally a dominating raw material, but mostly it is a minority resource/ mainly Early Neolithic); and Zone III: the remaining parts of Scotland (exotic: individual pieces/mainly Early Neolithic], most quartz alternatives seem to have roughly equal distribution patterns, with exchange networks spanning *c* 70–100km from centre to periphery.

The author believes that the use of these materials was driven partly by functional considerations, but also to an extent by stylistic considerations, in the sense that ownership of objects in these materials identified the bearer as belonging to a particular social group, or a larger alliance of groups (Gould 1980; Clemmer 1990). As touched upon in Section 6, the distribution of 'greasy' quartz bears some resemblance to the distribution of pitchstone, in the sense that the area immediately around the likely sources is characterized by general use of the resource, whereas the use of it becomes increasingly exclusive, in typological terms, with growing distance to the sources.

Only three quartz-bearing sites are known from the various parts of the Highlands, making it almost impossible to draw general conclusions on quartz use in these areas. However, assemblages from the Cairngorms mountain ranges and the surroundings of Ben Lawers differ so distinctly, in terms of raw material composition, that one may assume that quartz and flint were valued differently in those areas. In Aberdeenshire, sites along the River Dee, leading into the Cairngorms, are dominated completely by flint use (eg Paterson & Lacaille 1936; Lacaille 1944; Kenworthy 1981), and even in the foothills of the Cairngorms did flint represent the main lithic resource (Ballin 2004a), even though it had to be transported nearly 100km from the pebble deposits by the North Sea. In contrast, the Ben Lawers Mesolithic site (Atkinson *et al* 1997) is dominated by quartz, with flint representing a minority resource. It seems clear that, along the River Dee, flint was associated with more than functional values, giving sense to long-distance transport of this material, whereas, along the River Tay, flint was 'only' a functional resource, which was replaced, probably gradually, by quartz with growing distance to the North Sea pebble deposits.

The impression of quartz being perceived in prehistory as a largely functional material with few symbolic connotations (albeit used in raw or crushed form as a structural element of burial and ritual monuments; Section 7.3) is supported by the use of quartz in the three sedimentary regions in the north-eastern, central and southern parts of Scotland. As demonstrated by quartz alternatives throughout Scotland, quartz alternatives were frequently exchanged across distances of up to 100km, and in the case of pitchstone much more. However, as shown in Table 18, 'ordinary' quartz does not seem to have been acquired from sources outwith the general site catchment area. At Fordhouse Barrow in Angus, quartz is present through the many layers of the barrow, but it does only make up approximately 8% of the assemblage total. It is thought that this quartz was collected as erratics or river pebbles, originating from primary sources in the Grampian Highlands (Cameron & Stephenson 1985, 21; Ballin forthcoming f), rather than exchanged.

As suggested above, the three quartz forms 'ordinary' quartz (including milky quartz and most saccharoidal quartzes), 'greasy' quartz and rock crystal may have been perceived by prehistoric people as three (or more) different raw materials, with different visual qualities and flaking properties. This proposition is supported by the fact that the three resources are characterized by different distribution patterns, and different patterns of usage. The analysis of the Lewisian quartz forms (Ballin 2004e) and their distribution in relation to prehistoric settlements indicate that 'ordinary' quartz was procured within the limits of traditional catchment areas (radius *c* 10km), and they were used for the production of all tool types; 'ordinary' quartz was not exchanged, and access to the sources was probably in the control of individual families. 'Greasy' quartz may have been procured mainly in the Shieldaig area of Argyll, and if this assumption is correct, it was exchanged across up to 100km; a dual use pattern, with all-purpose use near the source and more selective use away from the source (mainly arrowheads), indicate the existence of two parties – the controlling group at Shieldaig (all-purpose use) and the receiving groups further afield, to whom ownership of artefacts in 'greasy' quartz was mainly emblematic (Wiessner 1983) and indicated their inclusion in a regional alliance. Rock crystal may have found sporadic use throughout Scotland, but the fact that, on Jura, where larger crystals are widely available (Mercer 1968, 20; Ballin 2001b), this highly flakable material was mostly crushed

between an anvil and a hammerstone, where it could have been used to produce regular, and very impressive, microblades (cf Ballin 1998a, 40); it is possible that the Jura rock crystal was mainly valued for the iridescent (aesthetic?) quality of rock crystal shatter?

7.3 Intra-site distribution

In the present paper approximately a dozen Scottish quartz assemblages are presented and discussed, but only five of these (Bayanne, Dalmore, Scord of Brouster, Cruester and Rosinish) are suitable objects for one or the other form of intra-site distribution analysis. The main background to this unfortunate situation is the fact that most 'old' assemblages were excavated, recorded and/or published in ways not permitting detailed analysis of on-site artefact distribution, mostly due to insufficient or inconsistent gridding (Saville & Ballin 2000, table 1). Amongst the above five assemblages only three were recovered in ways permitting more detailed analysis (Bayanne, Dalmore and Cruester), but as Dalmore was excavated in a stringent traditional grid system, and Bayanne and Cruester with reference to site contexts, the analytical approaches had to be adapted to the individual cases. Below, the main results of the distribution analyses are put forward.

7.3.1 Bayanne (Ballin forthcoming j)

The quartz assemblage from Bayanne on Yell, Shetland, was recovered from a number of cellular structures or houses, sheds, and areas between the houses and sheds. The finds are thought to date mainly to the Later Bronze Age.

Premises and data

The following analysis of site activities and site organization is based on a set of basic principles, inspired by Binford's discussion of settlement organization and site maintenance (ie clearing) strategies (Binford 1976; Binford 1978; Binford 1980; Binford 1983; also Ballin forthcoming j). The main elements of the analysis are:

- The *chip ratio* (chips as a percentage of the debitage total). Because of their small sizes (< 10mm), chips were rarely exposed to maintenance (preventive or *post hoc*), and a high chip ratio is therefore a localizing factor for primary production (knapping floors).
- The *average weight of the debitage*. The average weight of an assemblage is often a direct result of the chip ratio, that is, the higher chip ratio, the lower average weight; high average weight is, to some extent, a localizing factor for activity areas (ie areas where tools were used but not produced), or middens.
- The *flake ratio* (flakes as a percentage of flakes + chunks). The proportion flakes:chunks is interesting, as a preponderance of flakes indicates an activity area where flakes were used without secondary modification, or a cache. A preponderance of chunks may indicate either an area of primary production (ie where the exterior loose quartz was removed ('decortication'), or a midden.
- The *tool ratio* (tools as a percentage of the assemblage total). A high tool ratio indicates either an area for tool production, an activity area, or a midden.
- The *core ratio* (cores as a percentage of the assemblage total). A high core ratio indicates either an open-air knapping area, with the cores usually having a peripheral distribution, or a midden.
- The *presence/absence of preparation flakes*. The presence of preparation flakes usually indicates a knapping area, but if those flakes are relatively large they may have been cleared out in connection with site maintenance, in which case their location may indicate a midden.
- *Composition of the tool group*. If an event or structure is characterized by a high tool ratio, the composition of the tool group may indicate the actual activities.

The interpretation of a specific event or structure depends on the combination of the above elements, as well as the contexts in which they appear (for example, inside/outside house, house type, associations with non-lithic artefact categories, etc).

Event 1 (ard marks)

This event has the most versatile composition of non-debitage; it contains two cores, one arrowhead, eight scrapers, two piercers, two pieces with retouch, and two hammerstones, which were all found in the sondage in the north-east corner of the site. The high average weight of this sub-assemblage and its high tool ratio suggest that this event represents either a multi-purpose activity area or a dump.

Event 2 (Structure 4)

The debitage from this event is mainly refuse from primary production characterized by a high chip ratio and low average weight. The low core ratio suggests that the area constitutes either living quarters or a central, frequently used area of the settlement, from which cores have been cleared out in connection with site maintenance. However, only approximately 50 of 298 pieces are from actual culture layers, the rest are from pits, cuts and drains and may therefore pre-date Structure 4. The majority of those (114 pieces) are from one pit (context 672/673), and it is possible that this is not a post-hole but, for example,

a small refuse pit (the debitage from this context may represent a single knapping-event. This could be tested via refitting, although quartz is a complicated raw-material to conjoin). Only three of the seven scrapers from this event are from occupation layers, the remaining four were distributed in pits and cuts.

Event 3/4 (habitation of Structure 3)

The debitage of these events resembles that of Event 2 with high chip ratios and low average weights thus indicating primary production, but again the main bulk of the finds are from pits, drains and wall cores/piers, or from an area south-east of Structure 3. In the case of Event 3, lithic material from culture layers indicate activities in the norh-east corner of the interior, and in the case of Event 4, approximately 100 pieces are associated with occupation layers and indicate activities in the north-west cell and, primarily, the norh-east cell (debitage, scrapers and a hammerstone). A number of large plates of vein quartz probably represent stored raw material.

Event 5 (midden)

Very little material was retrieved from this event (75 pieces), but the composition of the finds supports the interpretation of Event 5 as a midden: few chips, high average weight, more chunks than flakes, and discarded tools.

Event 6 (Structure 5)

The high chip ratio, relatively low average weight (medium) and low tool ratio suggests that the activities of Event 6 were limited to primary production. The high flake ratio indicates that some sorting of the debitage took place separating out suitable blanks. The activities associated with this event did not take place within Structure 5 but in the area between Structures 3 and 5. Most probably this is an outdoor knapping floor.

Event 7 (Structure 1)

High average weight, low flake ratio, high core ratio with medium chip and tool ratios suggest that Event 7 is either an activity area or, more probably, a midden area: all cores and scrapers as well as a hammerstone were found right outside the entrance to Structure 1 indicating the presence of a 'door dump' (Binford 1983, 151). One scraper was retrieved from Bay 2, but the main bulk of the material from within Structure 1 was from beneath or inside walls and piers and probably pre-dates the event. The actual floor of Structure 1 was almost devoid of quartz debris suggesting that either site maintenance was undertaken regularly or quartz production did not take place inside Structure 1.

Event 8 (Structure 3 and 5 infill – midden)

This sub-assemblage has a low chip ratio, high average weight, and high tool and core ratios (44 scrapers, three piercers, three retouched pieces, three hammerstones and 18 cores) confirming the impression of this event being a midden. Event 8 seems to be a spatial continuation of the 'door dump' outside Structure 1. The composition of the sub-assemblage (Table 28) corresponds closely to that of Event 11 and, to some degree, Event 5 – two other assumed dumps or middens.

Event 9 (Structure 6)

Event 9 can be divided into two areas: outside and inside Structure 6. A low chip ratio indicates very limited primary production, and medium average weight combined with medium tool and core ratios indicate activity areas. A high flake ratio suggests sorting and possibly caching of suitable blanks, or activities in which flakes were used in an unmodified state, for example as knives.

However, the fact that this event is located on top of the outdoor knapping floor of Event 6, which was also characterized by a high flake ratio and sorting/caching, calls for caution in the interpretation of Event 9. We are either dealing with some degree of spatial continuity of activities from Event 6 to Event 9 or material from Event 6 may have been mixed into the Event 9 sub-assemblage.

Event 10 – insufficient material

Event 11 (abandonment of Structure 1)

The composition of this event corresponds to that of Event 8 and suggests that Event 11 is a midden: low chip ratio, high average weight, and high tool and core ratios.

Event 12 (Structure 2)/Event 13 (Structure 7)

The structures in these events are believed to be Pictish, and the worked quartz may be intrusive. For this reason, the two sub-assemblages are not included in this quartz-based activity analysis.

Event 14 (cultivation layer)

Most finds are from topsoil or cultivation soil.

Table 28 Bayanne. The events and their relative ratios

Event	Chip ratio	Av. weight (deb.)	Flake ratio	Tool ratio	Core ratio	Prep. flakes
1	Medium	High	Medium	High	Medium	
2	High	Low	Medium	Low	Low	
3	High	Low	Medium	Medium	Low	
4	Medium	High	Medium	Medium	Low	x
5						
6	High	Medium	High	Low	Medium	x
7	Medium	High	Low	Medium	High	x
8	Low	High	Medium	High	High	x
9	Low	Medium	High	Medium	Medium	
10						
11						
12	High	High	Low	Low	Low	
13	Low	Medium	High	Medium	Low	x
14	Low	High	Medium	Medium	Medium	
	High: 15.0–	High: 10.0–	High: 60.0–	High: 8.0–	High: 2.0–	Present
	Medium: 7.5–14.9	Medium: 5.0–9.9	Medium: 50.0–59.9	Medium: 4.0–7.9	Medium: 1.0–1.9	
	Low: 0–7.4	Low: 0–4.9	Low: –49.9	Low: 0–3.9	Low: 0–0.9	

Events and contexts: summary

The composition of Bayanne's lithic sub-assemblages makes it possible to refer the individual events to a number of spatial/behavioural categories:

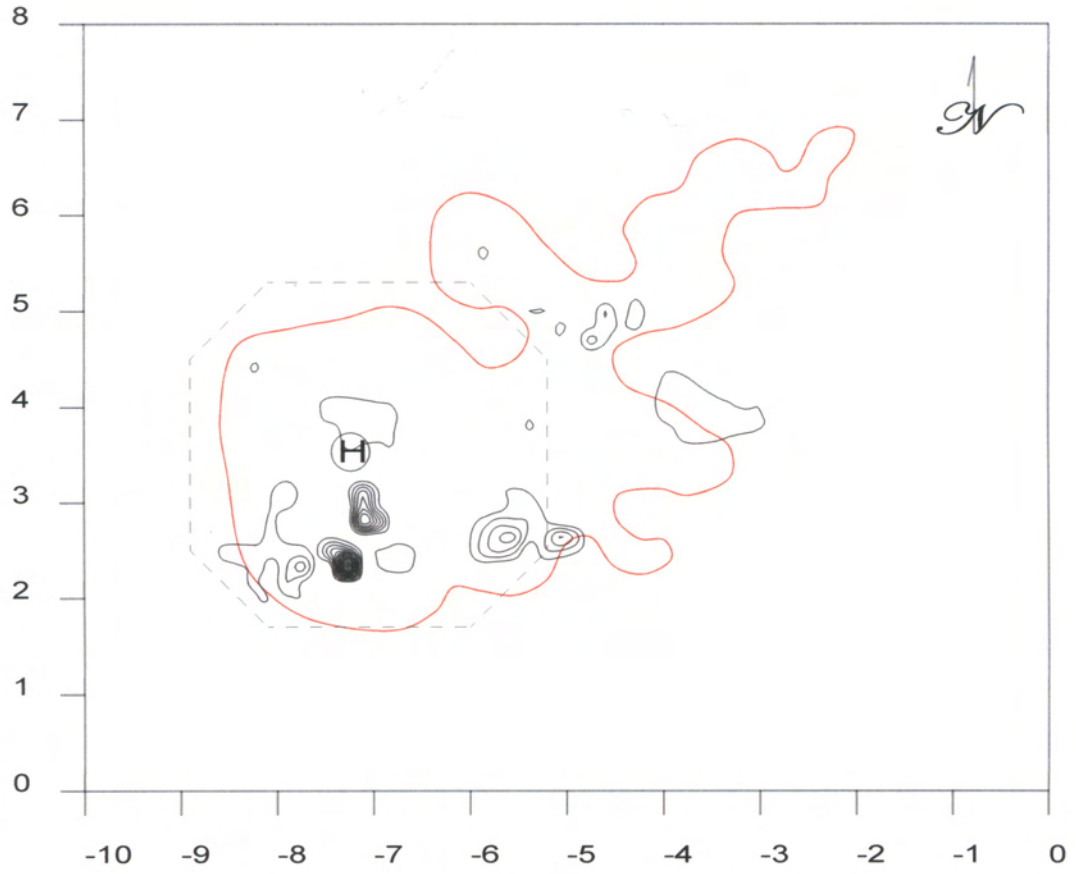
- Event 1: multi-purpose activity area.
- Events 2, 3 and 4: living quarters characterized by primary production and clearing-out of large-size refuse (chunks and cores), or, in case the refuse from primary production pre-dates the events, living quarters with no quartz production.
- Event 7: living quarters with no quartz production + 'door dump'.
- Event 6: outdoor knapping-area, sorting of blanks.
- Events 5, 8 and 11: middens.
- Event 9: some knapping, activity area, ?cache; some secondary material from Event 6?
- Events 12, 13 and 14: probably most of, or all, quartz in these layers originates from earlier deposits.

It is fairly obvious that material from, for example, wall cores pre-dates the structure those walls form part of, but the question is, to what degree this assumption covers material from drains and pits. However, the general impression of the spatial organization of activities on Bayanne is:

- Probably no primary quartz production took place inside the dwellings proper (Structures 1 and 3).
- Most knapping was probably undertaken outside the dwellings, including immediate sorting of suitable blanks (Event 6, between Structures 3 and 5; the quartz material gives no clues as to the function of the smaller Structures 5 and 6).
- The dwellings probably had a 'door dump' immediately outside the main entrance (Structure 1), with proper middens in older abandoned structures.
- No activity areas have been located with certainty, but it must be assumed that most of the numerous scrapers were used in the houses or sheds and dumped on the middens when they were exhausted – or the middens are activity areas as well as dumps.
- A few cores and tools have been found in individual cells or bays in the houses, and it must be assumed that they represent raw material and still usable tools.

7.3.2 Dalmore (Ballin forthcoming g)

During the excavations at Dalmore on Lewis, carried out partly by Sharples and partly by Ponting & Ponting, a number of superimposed house structures were investigated. These structures were separated stratigraphically into five main phases, as well as a number of sub-phases. The recovered pottery suggests some activity on the site during the Neolithic period, but most diagnostic pottery sherds, as well as diagnostic lithic artefacts, indicate a date of the main settlement in the Early Bronze Age.

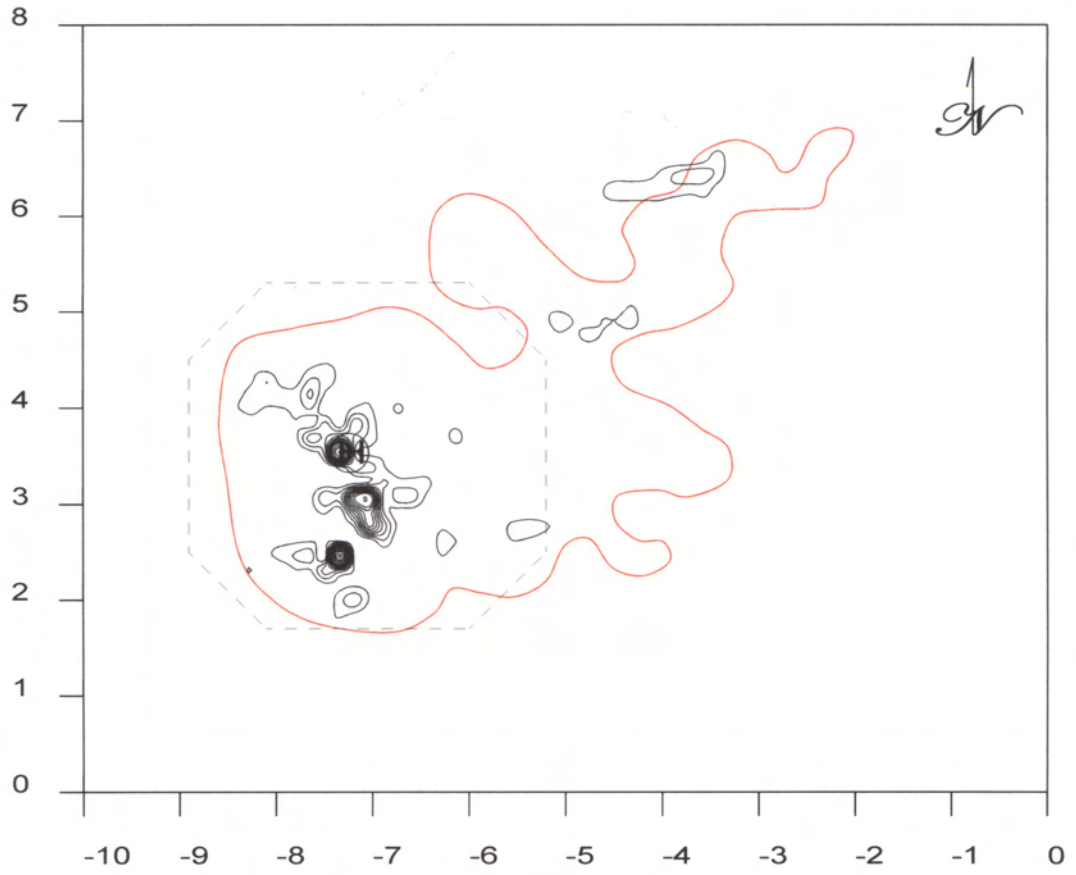


Illus 52 Dalmore. The distribution of all lithic finds from Sharples' excavation. The red wavy line marks the outer limits of the horizontal distribution of lithic artefacts, whereas the finer black contours demonstrate the concentration of these finds. The stippled 'polygon box' indicates the approximate location of the main, undivided oval building (which was re-arranged and divided in the later phases; Sharples 1983a; Sharples 1983b), and the circle (marked H) represents the central slab-built hearth of Phase II (Context 082). Contours at 1 piece intervals (lowest contour = 3 pieces)

The diminutive size (illus 52) of the main building at Dalmore implies that this was the habitation of a small group of people, possibly a family unit. Stratigraphical information (Sharples 1983a; Sharples 1983b) suggests that, at any one time, there was only one hearth in operation and, as a consequence of consecutive re-arrangements of the living-space, this hearth was replaced several times in a south-westerly direction, with the exception of the latest hearth (Phase V) being by the east wall of the building (illus 53). The entrance and passageway is clearly indicated by a north-easterly tongue of lithic debris. Immediately outside the entrance, quartz debris is found on either side of the doorway, indicating the presence of two so-called 'door dumps'.

With few exceptions, the distribution of lithic rubbish, including abandoned cores and tools, is restricted to the area within the oval walls of the Dalmore building. This indicates that most activities involving lithic materials (primary and secondary production, as well as use of tools and unmodified blanks) took place in the house, with limited activities taking place immediately outside the north-easterly passageway. This differentiates the Dalmore site from, for example, the Bayanne site in the Shetland Islands (Ballin forthcoming j). Bayanne is a phased Later Bronze Age site with houses and workshops, and the activity analysis suggests that no primary or secondary lithic work was undertaken inside the dwellings, and only to a minor degree within the workshops; the majority of the *c* 3000 pieces of worked quartz are associated with outdoor middens, knapping floors and activity areas. Evidence from other quartz-rich house sites in northern and western Scotland, suggests that, in most cases, the production and use of lithic blanks and tools took place within buildings rather than outside (eg Scord of Brouster: Whittle 1986, 87; Catpund: Ballin-Smith 2005; Tougs: Hedges 1986, 14–17; Sumburgh: Downes & Lamb 2000, 112–16).

As a general rule, primary production took place by the various hearths of the Dalmore building, possibly secondary production and tool use as well. This association of activities involving lithics with fireplaces is well known throughout prehistory, and it is supported by evidence from other northern and western Scottish house sites, for



Illus 53 Dalmore. The distribution of burnt lithics from Sharples' excavation. Contours at 1 piece intervals (lowest contour = 1 piece)

example Sumburgh (Downes & Lamb 2000, 115). In Dalmore's Phase II, only approximately one-sixth of the quartz was affected by fire, compared to approximately one-half of the site's entire quartz assemblage; this is probably a result of the Phase II knapper sitting slightly further away from the hearth than the later knappers of the building, possibly to the north-east of the central hearth.

A loose concentration of cores suggest a possible internal door dump to the north-east, and tools deposited during Phases II/III in the debris-free areas to the north and east may either represent abandoned material tossed out of the main activity zone to avoid future problems to in-house traffic, or small caches. The notion of caches is supported by a cobbled area to the north which may be the base of a wall, or a paved area: if this is, in fact, a paved area, this may be the sleeping area, which explains why this part of the building is virtually free of knapping debris.

The composition of the tool group suggests that, at Dalmore, an important activity was the production of barbed-and-tanged arrowheads. This suggestion is substantiated by several complete arrowheads (8), as well as a number of early- and late-stage arrowhead rough-outs (11). The many scrapers (38), obviously, indicate 'scraping' activities, and the tendency of some Early Bronze Age scrapers to have acute, or relatively acute, scraper-edge angles (55–65°) may suggest the processing of hides or skin, as opposed to the harder materials wood, bone and antler (Broadbent & Knuttson 1975; Jeppesen 1984; Thorsberg 1986; Juel Jensen 1988). The association of scraper-edge angles with function is discussed in more detail in the report on the quartz assemblage from Bayanne (Ballin forthcoming j). Other tool types than arrowheads and scrapers are present in single-digit numbers (piercers, notches, denticulates and truncations).

7.3.3 Cruester (Ballin forthcoming e)

This assemblage was recovered from a complex cellular stone structure at the centre of the Cruester Burnt Mound on Bressay, Shetland (Moore & Wilson 2003a), almost identical in plan to the structure associated with the burnt mound at Tangness, Eshaness, Shetland (Moore & Wilson 1999). The finds are thought to date mainly to the Later Bronze Age. As shown in Table 29, quartz artefacts were distributed across most of the building: the Passage 12 pieces; Cell A 13 pieces; Cell C six pieces; Cell D nine pieces; Cell H (cistern) two pieces; and the Tank Area one piece.

Obviously, the spatially restricted passage would not have been the focus of activities involving the

Table 29 Horizontal distribution of artefacts – Phase 3

Context no.	Context description	Total quartz	Flakes*	Chunks	Core prep.	Cores	Tools
8	Cell A – mottled ashy deposit	5		5			
13	Floor of passage – sandy loam	5	1	3			Scraper
23	Cell A – red-brown soil	6		5		Single-platf.	
24	Cell A – black soil	2		2			
32	Floor of passage – sandy loam	7	4	3			
39	Cell D – grey-brown clay	9	5	4			
40	Cell C – dark brown clay	1		1			
41	Tank Area	1		1			
46	Cell C – dark brown clay	5	1	3		Opp. platf.	
51	Cell H - cistern	2		2			
8/23	See above	5	1	4			

use of quartz tools (modified or unmodified), or for the storage of quartz tools, and it is most likely that the implements recovered in that area were dropped during movements between the exterior and interior of the building. Though it is almost impossible, in the present numerically limited case, to determine with certainty whether the individual tools, blanks and cores were produced, used or stored in the various rooms, the composition of the small sub-assemblages does suggest some specialization between rooms. The fact, for example, that all quartz artefacts in Cell A are either chunks or cores may mean that this room was a focal point for primary production, and the fact that the majority of the pieces from Cell D are either flakes or relatively thin chunks may indicate that in this room unmodified quartz tools were being used (cutting activities)? However, due to the small sizes of the sub-assemblages, these suggestions remain somewhat speculative.

The evidence from various quartz-bearing locations suggests that, in prehistory, different practices were followed regarding structures and quartz use. At the Middle Bronze Age site Bayanne (Yell, Shetland), for example, all primary and secondary production was carried out either outside the dwellings, or in specialized workshops, and the quartz artefacts recovered from the houses are thought to be stored tools, blanks or raw material (Ballin forthcoming j). At the Lewisian Beaker site Dalmore, on the other hand, primary and secondary production was carried out within the building, and quartz artefacts found outside the structure probably mainly relate to dumped material (Ballin forthcoming g). Evidence from other quartz-rich house sites in northern Scotland, suggests that, in most cases, the production and use of lithic blanks and tools took place within buildings rather than outside (eg Scord of Brouster: Whittle 1986, 87; Ballin 2007a; Catpund: Ballin 2005; Tougs: Hedges 1986, 14–17; Sumburgh: Downes & Lamb 2000, 112–16).

7.3.4 Scord of Brouster (Ballin 2007a)

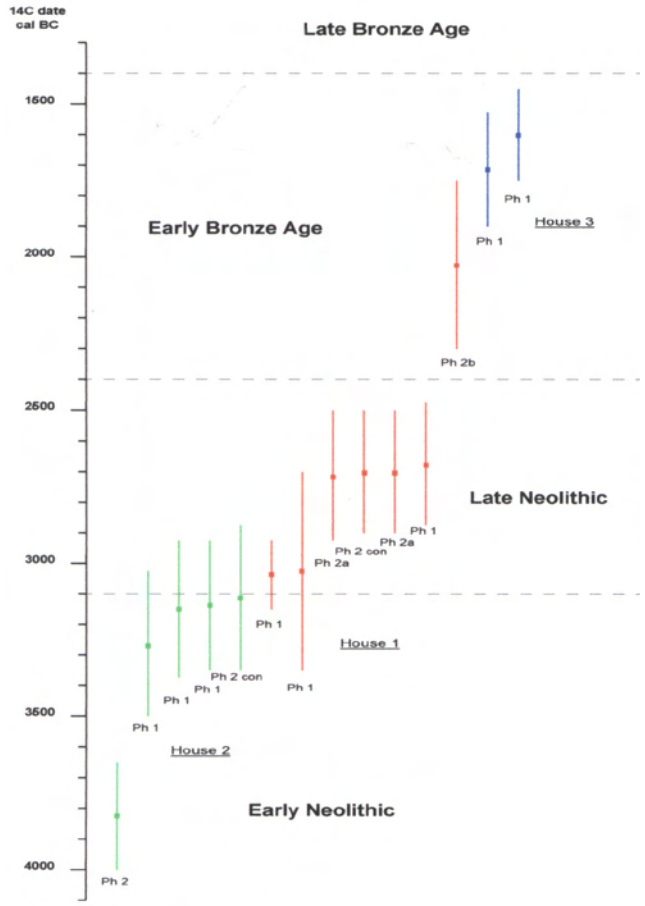
This assemblage was recovered during an excavation of a settlement site in the west mainland of Shetland. The site included three oval or cellular house structures, with one structure probably replacing the other (House 2 ⇒ House 1⇒ House 3). Houses 1 and 2 most likely date to the later part of the Early Neolithic period, whereas House 3 may be of an Early Bronze Age date (illus 54).

In this section, the debitage, core and tool distribution is discussed, as well as the activities suggested by the scattering of artefacts. First, the internal distribution patterns of the three houses is dealt with, followed by the distribution across the three houses. As the principles of recovery and recording of finds differ from house to house, and between layers, the author was incapable of producing standardized distribution maps (point and contour maps) and, in the following discussion, reference will be made to Whittle's general distribution maps. (For a detailed discussion of the three structures see Whittle 1986, 85–90.)

House 2 (Whittle 1986, figs 68–69)

This structure is approximately kidney-shaped, includes two recesses, and has no obvious entrance. The fact that individual finds were recorded in a variety of ways (exact 3D-plotting, per quarter of square metre, and per sector) makes it difficult to get a general picture of the distribution of lithic artefacts. However, it is the author's impression, that the distribution pattern is more or less the same throughout Phases 1 and 2 (pre-house, construction and use-phases) of House 2.

Generally, most quartz artefacts were found in the western half of the house, with fewer finds in the two central sectors, and even fewer in the two eastern sectors and in the north-east recess. Though the



Illus 54 The dates of the three Scord of Brouster houses

majority of finds from Phases 1 and 2 were recorded per sector, the more precisely recorded and plotted finds suggest that the tools were mostly found in the open area around Hearth F4, a possible central fireplace. The cores were partly recovered from areas characterized by knapping and partly from more peripheral areas. Cores from prehistoric sites are frequently found in the peripheral parts of settlements or houses, as they may have been removed ('tossed') from the central zone of sites as part of preventive maintenance (Binford 1983, 189).

The individually plotted quartz objects of Phases 1 and 2 indicate that the northern (F1) and north-eastern (F2/3) recesses were almost, but not entirely, devoid of finds. The larger (F2/3) of the two recesses is approximately 2m long and may have been a sleeping area (cf distribution of lithic finds in the Dalmore house; Ballin forthcoming g). The function of the northern recess is less certain. The quartz distribution in Phase 3 (decay) is probably linked to the use of the location after its general abandonment. Lithics were found evenly scattered across the interior of House 2, but also across the wall tumble and outside the house.

The above distribution patterns only yield little and general information on activities involving quartz use. Knapping was mainly carried out in the western half of the structure, with some knapping and tool use taking place around the central hearth. Clearance of rubbish appears to have taken place, but mainly in the form of preventive, not *post hoc*, maintenance (Binford 1983, 189), leaving large amounts of lithic waste cluttering the floor space. Two areas, Recesses F1 and F2/3, have been kept relatively free of rubbish, and the size of Recess F2/3 would have allowed use as a sleeping area.

House 1 (Whittle 1986, figs 70–74)

This building is oval, with six recesses, and orientated approximately north-west/south-east; it has an entrance to the south-east. In Phase 1 (pre-house), most of the quartz waste, cores and tools were scattered across the southern half of the building, and a large concentration of quartz artefacts was deposited under the southern wall, outside Trench F10, and a small concentration in Recess 1 to the north-east. The quartz distribution was associated with three hearths, F1 in Recess 4 to the south-west, central hearth F2, and the more complex hearth F4–8 in Recess 1 to the north-east. No areas were specialized, and quartz knapping and tool use seem to have taken place throughout the space occupied by lithic debris.

In Phase 2 (main use-phase), there were less quartz and it had a wider distribution. The centre of the building was more or less free of clutter, with most of the lithic finds deriving from either areas along the northern wall, or from a zone just inside the southern orthostats. In the northern half, most of the quartz was found in Recess 6, and small concentrations in Recesses 1 and 2. In the southern half, most of the quartz was recovered from within, or just outside Recess 4, and several pieces from the area surrounding Orthostat 8 (separating Recesses 3 and 4). Again, quartz waste, cores and tools were mixed, with no apparent separation of, for example, knapping floors and areas for tool use. There were a number of hearths (F15 being a central fireplace), or ashy patches, along the central long axis of House 1, the area kept free of lithic waste.

It is possible that some recesses were workspaces, and others sleeping areas, but the quartz concentrations are not dense enough to have prohibited any of the recesses from having been sleeping areas. However, Recess 6 was also associated with a central concentration of coarse stone tools (mainly ard points), suggesting that this particular part of the structure may have been a working area, and the distribution of small scoops and fireplaces in Recesses 1, 5 and 6 makes Recesses 2-4 most probable as 'private quarters', or sleeping areas. In the case of dwellings, traffic in and out of buildings frequently results in a trail of lithic debris in the entrance area, and a solid concentration immediately outside the doorway (cf Dalmore; Ballin forthcoming g). An entrance trail and exterior concentration were not identified in connection with House 1, Phase 2.

Table 30 Scord of Brouster, Houses 1 and 2. The proportions of the main tool categories

	Numbers		%	
	House 1	**House 2**	**House 1**	**House 2**
Arrowheads	2	0	2	0
Knives (incl. truncated piece)	7	7	6	8
Scrapers	91	69	75	77
Piercers	4	2	3	2
Notches and denticulates	2	2	2	2
Pieces with various retouches	12	9	10	10
Fabricators and hammerstones	3	1	2	1
TOTAL	**121**	**90**	**100**	**100**

In Phase 3 (decay), the majority of the worked quartz pieces were found along the walls of the structure, with only a small number of lithic artefacts deriving from the central parts of the building. The discussion of distribution patterns is limited by the retrieval methods, with the findspot of some quartz artefacts having been recorded precisely, and some only by house sectors (each *c* 2–3 x 2–3m). The individually plotted artefacts indicate a concentration in one corner of Recess 1, and the sector-recorded finds suggest the presence of one or more concentrations in the eastern quadrant (possibly the Recess 1 concentration identified by the individually plotted pieces), and outside the entrance. The latter imply either the presence of an entrance trail or a so-called 'door-dump' (Binford 1983, 151), where rubbish was deposited in connection with *post hoc* maintenance.

The distribution of quartz does not allow a more detailed analysis of the activities in House 1. Considerably more quartz blanks, cores and tools were produced during Phase 1 than during Phase 2, but as the exact duration of the individual phases is unknown, it is not possible to infer that more quartz implements were produced and used per time unit (eg per year) in Phase 1. No areas appear to have been used particularly for primary production or tool use, as blanks, cores and tools are generally mixed. The distribution of lithic debris was more widespread in the pre-house phase than in the main occupation phase, with the quartz of Phase 2 respecting and avoiding the central space. Knapping and tool use seem to have taken place mainly in, or just outside, the various recesses (at the Middle Bronze Age site of Bayanne on Shetland no knapping took place inside the dwellings, but only outside the houses or, to a minor degree, in work-sheds; Ballin forthcoming g). A low local density of lithic and stone rubbish suggests that one or more of Recesses 2–4 may have been sleeping areas, with the remaining recesses possibly having been used as work-spaces. The finds of the abandonment phase are not numerous enough to allow detailed inference, but the small concentration of quartz in a corner of Recess 1, and another possibly outside the entrance, suggest that even at this stage of disintegration the structural elements of the building were respected in the organization of activities.

House 3 (Whittle 1986, figs 75–76)

The lithic finds of this structure are too few in number to allow definition of internal spatial patterns.

Lithic artefacts and activities

The sub-assemblages from Houses 1 and 2 are substantial, whereas the material from House 3 is numerically limited: 5688 lithics (59% of the total collection) were recovered from House 1; 3772 lithics (39%) from House 2; and only 227 lithics (2% of the total) from House 3. The proportions of the three main categories, debitage, cores and tools, are roughly the same in Houses 1 and 2, with debitage making up approximately 97% of all lithic artefacts, cores *c* 1% and tools *c* 2%. In House 3, debitage constitutes 99%, and cores and tools each *c* 0.5% (one single-platform core and one retouched piece).

As shown in Table 30, the tool spectra of Houses 1 and 2 are almost identical. In both sub-assemblages scrapers make up approximately three-quarters of all tools, with retouched pieces being the second most common tool group (10%). The relatively large number of curved knives makes knives comparatively numerous in both houses (6–8%). All other tool categories represent proportions of between 0% and 2% of the two sub-assemblages.

In terms of function, the arrowheads were produced either for defensive or hunting purposes; the two types of knives may represent different functional categories: the scale-flaked knife and the truncated piece, with their straight edges, would have been suitable for traditional cutting work, for example butchering, whereas the curved knives may form a separate group of specialized implements – their precise function is presently unknown. The analysis of scraper-edge angles (Ballin 2007b) suggests

that the scrapers were manufactured mainly for the processing of harder materials, such as bone, antler and wood. The fact that half of the piercers have almost blunt tips and the other half acutely pointed tips indicate that these may have been used for a variety of tasks – the blunt, more robust pieces may have been involved in the drilling of harder materials, and the more acutely pointed ones may have been used to penetrate softer materials, such as leather and skin. The notched, denticulated and retouched pieces probably represent a number of different functions.

The leaf-shaped arrowhead CAT 2297 from House 1 is a rough-out and proves that arrowheads were produced on site. CAT 2080 (House 2) is most probably a pre-form of a large leaf-shaped arrowhead broken during production, and CAT 2050, 2092 and 2124 (Houses 1 and 2) are probably base-fragments of leaf-shaped arrowheads. They may have broken during use (hunting?) in the field, and the arrows, with the bases of the points still attached to the arrowshaft, were brought back to the settlement for retooling (Keeley 1982).

The number of functions covered by the lithic tools from Houses 1 and 2, and the similarities between the two sub-assemblages, support the notion of the structures as being permanent, or semi-permanent (seasonal), dwellings (cf Whittle 1986, 137). It is a well-known fact that in prehistoric times many, or most, tools were made in perishable materials, and a large number of the lithic tools may have been used for the manufacture of tools and other products in organic raw materials (wooden bowls and spoons, bone piercers and points, clothing and adornments, fish-traps, nets, bows and arrows, shafts and handles, etc). No such objects were recovered at Scord of Brouster, but the excavation of prehistoric settlements from submerged or wetland sites (eg Oakbank Crannog, Loch Tay, Perthshire; Dixon & Cavers 2001, 78–9) demonstrates that implements in organic materials usually made up a large proportion of the tools employed by prehistoric people.

The lithic assemblage from House 3 (practically all from the main Structure 3a) defines this unit as functionally different. As demonstrated by Fischer *et al*, lithic reduction produces much debris in a short span of time (Fischer *et al* 1979, 12). In one experiment at the Lejre Archaeological Research Centre, Denmark, almost 20,000 flakes were manufactured in 2 hours and 40 minutes, and the 170 flakes and indeterminate pieces from House 3 may represent a single brief knapping event. The small amount of lithic rubbish probably represents one of three scenarios: either House 3 was in use for a very short period; it was thoroughly cleared out; or the structure may have had a specialized function (or a combination of the three). The composition of the debitage supports the latter option.

The sub-assemblage from House 3 includes the same proportion of flakes as Houses 1 and 2 (on average 77% of the debitage), but fewer chips (3.5% against *c* 16–20%), and many more natural pieces of quartz (*c* 20% against *c* 3–6%). As suggested above, the flakes of House 3 may derive from a single knapping event, and the large amount of natural quartz is probably a bi-product of the decortication of relatively large numbers of raw quartz blocks. Most of the natural quartz has sandstone adhering to it, and this material had to be removed before the collected quartz was suitable for schematic reduction. The decortication of raw quartz blocks would not produce many chips; they would largely be produced as part of the primary and secondary production sequences. The decorticated core rough-outs were most probably removed from the building for further reduction elsewhere.

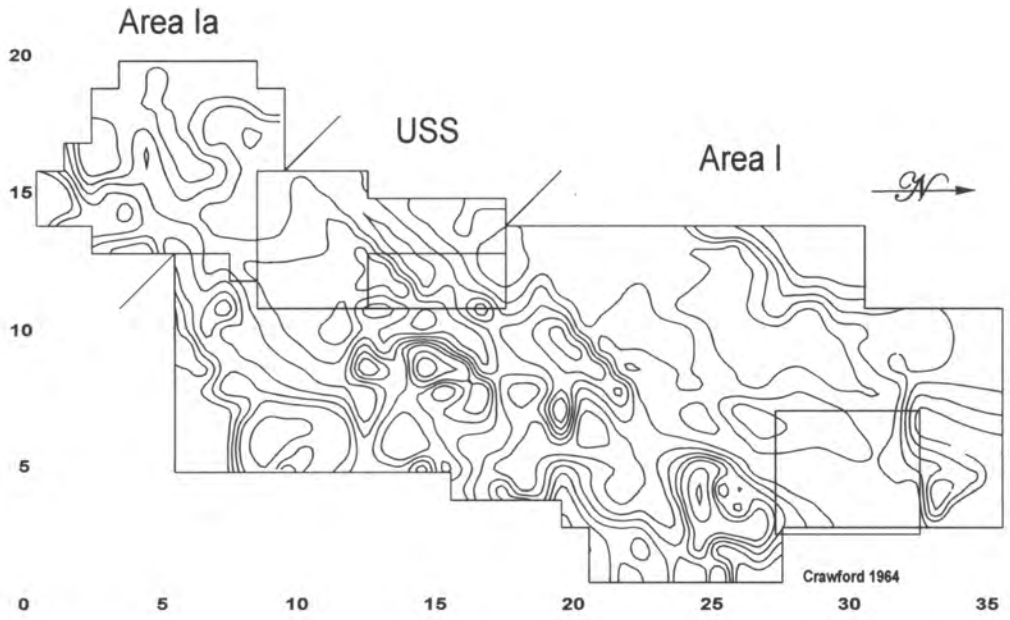
This suggests that House 3 may have had a workshop-like function, though the internal structure of the building, with a central hearth and five recesses or cells, corresponds to the structure of other contemporary Shetland dwellings (eg Calder 1956). As the radiocarbon dates indicate a possible chronological overlap of the use-phases of Houses 1 and 2, but none between House 3 and the other buildings, it is uncertain which settlement the House 3 workshop was linked to.

7.3.5 Rosinish (Ballin forthcoming h)

During the excavation of this wind-eroded machair site, Rosinish was divided into three spatial units: Areas I, II and III. Area I is the main Beaker midden, and includes a U-shaped structure (dwelling?), Area II, north of Area I, is a much smaller Beaker midden, and Area III, south of Area I, constitutes a midden with traces from the Iron Age and Medieval periods (Shepherd 1976; Shepherd & Tuckwell 1977b). A cursory examination of the catalogue showed that the main bulk of the lithics (2746 pieces) were recovered in Area I, with only 818 lithics deriving from Area II, and four from Area III. Most of the finds from Areas II and III were chips from sieved samples. For these reasons, it was decided only to include the lithics from Area I, the main Beaker midden and the U-shaped structure, in the distribution analysis.

A basic distribution analysis showed that most of the artefacts were concentrated in three south-west/north-east oriented bands ('ridges') with find-poor bands ('valleys') separating them (illus 55). The 'valleys' and 'ridges' run perpendicular to the site's main blow-out (Shepherd & Tuckwell 1977b, fig 1), and it is possible that these distributional features owe their existence mainly to wind-erosion/dune-building.

The most important distributional phenomenon is the fact that most of the burnt quartz was recovered from areas to the north, north-west, west and south-west of the post-midden U-shaped structure. The burnt quartz must therefore be associated with this structure and activities in it. A weaker tendency in the distribution of flint artefacts suggests that the flint tools were not produced and used in the same



Illus 55 Rosinish. The distribution of quartz flakes. Contour intervals: 1 piece (0–6), 2 pieces (>6); lowest contour: 1 piece. The location of Crawford's 1964 excavation is indicated (Crawford 1977)

areas, with the unworked flakes mainly deriving from the southern part of area I proper, and the flint scrapers from areas outside this zone. Generally there is very little flint debitage, and most likely the majority of the flint tools were made outside the site.

7.3.6 Summary

The general intra-site spatial patterns revealed by the above presentations are influenced by the fact that all Scottish sites available for this form of analysis are Neolithic/Bronze Age house sites. Open-air Mesolithic and Neolithic/Bronze Age sites were organized in entirely different ways, with more pronounced toss zones (Ballin forthcoming j). However, the identified patterns correspond well with the patterns observed by Binford (Binford 1983, 172–87) in an analysis of the huts, houses and tents of hunter–gatherer groups. For this reason, the structure of the following summary has been based on the spatial elements used in Binford's analysis.

Knapping floors

In general, primary production appears to have been an indoor activity, which mainly took place around indoor hearths, but at Bayanne the actual dwelling structures appear to be completely devoid of lithic production waste. Here, the production of blanks, and possibly tools, seems to have been carried out outside, and between, the various structures, occasionally in combination with preliminary sorting of the produced blanks (sorting was also witnessed at Steinbustølen in the Norwegian High Mountains; Ballin 1998b). These differences may be explained in several ways, such as (i) different yearly cycles of the inhabitants of the structures, and (ii) different abandonment patterns.

As indicated in a forthcoming publication, blank production was generally associated with fireplaces (Ballin forthcoming j), as fire provided light, heating and protection, and '...the domestic hearth was the focal point in the daily life of the inhabitants' (Stapert 1989, 5). It is obvious that, in the cold Scottish winters, quartz knapping would not have been carried out outside the dwellings, whereas, in the summer periods, it could have been. Though there is no definite evidence indicating when the above structures were inhabited, it is possible that they were used at different times of the year, with some house structures representing year-round occupation, whereas others may be shielings (Whittle suggests that Scord of Brouster may represent semi-permanent occupation; Whittle 1986, 133–50). Though the spatial pattern at Bayanne may have been influenced by site maintenance, for example clearing of the houses, the fact that all production waste was found outside the dwellings may be an indication that at least the last (outdoor) knapping events took place in the warmer half-year.

At Kavonkangas, in Finland, the Neolithic Houses 34 and 35 are characterized by the finds mainly being inside (H 35) or outside (H 34) the structures. The excavator interprets these differences as representing different forms of site formation, or modes of abandonment (Rankama 2002, 107; Rankama 2003, 216), where House 34 was cleared, and House 35 not. This may be due to the inhabitants expecting to return to the former site (which, for some reason, they

did not), whereas the inhabitants did not intend to return to the latter. However, it is also possible that the two structures were inhabited at different times of the year, allowing quartz knapping to be undertaken outside House 34 (summer?), but making it necessary for primary production to be undertaken inside House 35 (winter?). At Rosinish, disparity between the numbers of blanks and tools indicate that most of the tools may have been imported into the site, and not produced inside or outside the so-called U-shaped structure.

Disposal areas

Disposal areas are known in a number of forms, such as toss zones (preventive maintenance), and proper middens or dumps (*post hoc* maintenance; Binford 1983; Ballin forthcoming j). All these types of waste areas were identified in connection with the above analysis.

At Dalmore and Scord of Brouster, the distribution patterns suggest that preventive maintenance took place, and larger pieces of quartz waste appears to have been tossed from the central parts of the dwellings towards the peripheral areas. When rubbish turned into irritating clutter, occupants in many cases commenced *post hoc*, or actual, clearing, initially in the form of door dumps, immediately outside the house entrance, and, later, in the form of more remotely located middens. At Bayanne, Dalmore and Scord of Brouster, quartz door dumps were identified, and at Bayanne an actual midden was located in an abandoned building. It is possible that, at Rosinish, the concentration of burnt quartz immediately outside the U-shaped structure represents a door dump, but it seems to be a more substantial midden, possibly located at the 'back-side' of the house. The Norwegian Mesolithic 'pit-houses' frequently include a small and a larger outside dump or midden (eg Persmyra 37a and 39; Boaz 1997; also see the distribution of finds at Holter 1; Ballin 1998a, 120), one of which is probably a door dump and one a 'back-side' midden.

As demonstrated by the frequently well-preserved Norwegian house sites, the internal artefact scatter was in many cases linked to the door dumps by a tongue of debris, identifying the house entrance (eg Persmyra 37a, Boaz 1997, fig 30). This is also the case at Dalmore, where an extended tongue of quartz waste connected the interior clutter with two door dumps, and possibly even a small internal door dump, and an 'entrance trail' was identified at Scord of Brouster House 1 (Phase 3).

In some cases, extended occupation at a site allowed the outdoor dumps and middens to grow to impressive sizes and eventually merge into one mound surrounding or covering the building. This seems to be the case at Cruester, where the house site developed into a burnt mound, some of which was quartz. At Persmyra 112 in Hedmark, Norway (Boaz 1997, fig 60), the northern of two pit-houses was completely surrounded by lithic waste and other debris.

It is possible that the various types of waste deposition represent stages in the 'life' of a prehistoric house, giving at least a 'hint' as to the use intensity of the individual building. The development of toss zones is probably the result of an almost automatical behavioural pattern, something 'you just do' because it has proven to be practical: when a piece of rubbish is sizable enough to represent a potential future problem to activities on, or traffic across, the house floor, it is automatically tossed out of the centre. The development of actual dumps or middens, on the other hand, is most likely a result of an extended visit to a location, as it takes some time for rubbish to grow into a problem in need of special attention (formal clearing activities; Binford 1983, 189–90). Probably, door dumps start developing first, middens later, and burnt mounds, such as the one at Cruester, may be the last stage of this process.

Activity areas

The definition of activities on Scottish quartz-bearing sites is supported by the distribution of quartz on the sites of Bayanne, Dalmore, Scord of Brouster and Cruester. At Bayanne and Scord of Brouster, the activity patterns are influenced by the presence of more than one structure, and apparent specialization between the various buildings. At Bayanne, quartz tools were probably used between the main structures and the smaller 'sheds' or workshops, or within the sheds. At Scord of Brouster, House 3 may have been a workshop, associated primarily with the decortication of the collected or quarried quartz (in this case, mainly the removal of excess sandstone remains from the local bedrock).

At Dalmore, Scord of Brouster and Cruester, most quartz tools were used within the dwellings. Some degree of specialization seems to have taken place between the various sub-areas of the houses, such as the central parts, and the bays or cells. At Cruester, Cell A (characterized by robust chunks and cores) may have been set aside for primary production, whereas Cell D (characterized by flakes and thinner chunks) may have been used mainly for tool using activities (cutting?). At Scord of Brouster, a division of labour is not clearly defined by the quartz, and knapping and tool use may have been spatially overlapping activities. There does, however, seem to have been a separation of quartz and stone production, as in Recess 6 of House 1 mainly sandstone ard points were found.

The quartz tools from Bayanne, Dalmore and Scord of Brouster were distributed slightly differently in relation to the centre of the houses. At Bayanne, practically no tools at all were found in the dwellings; at Dalmore, most tool use may have taken place around the central hearth; and at Scord of Brouster, tool use appears mainly to have taken

place either around a central hearth (House 2), or at some distance from the central area (partly within the recesses), with the centre being reasonably free of clutter (House 1).

Most of the prehistoric houses include either 'clutter-free' areas along the walls or, in the cellular structures, in one or more cells. These parts may have been sleeping areas, where no primary or secondary production took place, but occasionally these areas are associated with small caches (see below), or they may be paved (at Dalmore, a paved area is associated with a possible cache). Similar arrangements are known from several of the Scandinavian dwellings, such as the almost archetypal distribution of finds in the house of Persmyra 37a (Boaz 1997, fig 30), with its internal production waste, entrance trail, door dumps, 'back-side midden' and 'clutter-free' sleeping area.

Burnt quartz

As indicated in Section 4.4.3, Scottish quartz assemblages are generally characterized by high ratios of burnt quartz, and particularly the house sites have high ratios (*c* 40–65%; Table 17). The general tendency for this burnt quartz waste is to either indicate the position of shifting hearths, or dumps/middens. At Dalmore, burnt quartz pinpoints the location of a number of, probably not contemporary, hearths, with one relatively weak concentration indicating the slab-build central hearth (illus 53). At Rosinish the bulk of the burnt quartz was found in a midden outside the U-shaped structure.

The investigation of burnt quartz is still in its infancy, and much research needs to be carried out to reach an answer to the question of the activities creating this burnt waste. Some of the burnt quartz may be rubbish from cooking ('pot-boilers') or saunas, or possibly from attempts at heat-treating quartz, as indicated by one invasively retouched curved knife with scorched faces (Scord of Brouster). The different types of burnt quartz (yellow and white, dull and shiny) may characterize waste from different activities, but these differences may also have been caused, at least partly, by post-depositional factors, such as soil conditions.

Caches and stores (in bays/cells etc)

Possible caching is suggested by quartz finds from Bayanne and Dalmore. At Bayanne, the quartz from Events 6 and 9 (superimposing Structures 5 and 6) indicates that sorting of the produced blanks may have taken place, and the sorted and collected blanks may be defined as caches. In the peripheral parts of the Dalmore house (Phases II/III), two small tool concentrations (each including a hammerstone) may be caches. This interpretation is supported by the fact that they were found in the relatively clutter-free part of the house in close association with the paved possible sleeping area.

Small caches are occasionally found on prehistoric sites, and frequently in possible dwelling structures. On Storsand 53, in the Norwegian Oslofjord area (Ballin 1998a, 43), a number of collected quartz crystals were recovered within an area interpreted by the author as a possible dwelling (?hut, ?tent). In Finland and northern Sweden caches of quartz chunks have been identified in connection with quartz quarries (eg Broadbent 1979, 102; Alakärppä *et al* 1998, 11). In his report on the Richburgh Quartz Quarry, South Carolina, Cantley suggests that '... once a small or sufficient quantity of early stage biface blanks were produced, they were curated to other nearby habitation or special purpose sites where they would be finalized into finished tool forms' (Cantley 2000, 103, quoting House & Ballanger 1976, 128). Most probably, caches of raw material, prepared cores, blanks and preforms are to be expected at quartz quarry sites.

7.4 Burial and ritual sites

In Scotland, quartz has been recovered from several burial or ritual sites. These sites are usually either cairns, megalithic graves or cist burials, and the quartz may take different forms, probably relating to the specific function of the deposited quartz, or the place and date of the monuments (different perceptions of quartz and different cultural traditions). In some cases, the quartz is in the form of raw pebbles or cobbles, in other cases it has been crushed, or it has been transformed into blanks, cores and tools.

At the Calanais ritual complex, on Lewis, a quartz assemblage was recovered, including blanks, cores and tools. Most of this material was found in association with the central cairn, but it is thought (Ballin forthcoming a), that the majority of the finds represent on-site activity prior to or following the cairn's construction. However, the distribution of quartz within the cairn, with most trenches including *c* one-third burnt quartz and Trench H *c* 80% burnt quartz, indicates that activities at the cairn may have included fire – although it cannot be ruled out that this pattern simply reflects the scooping up of soil for the cairn from different parts of an underlying or nearby settlement. A small number of mainly quartz arrowheads were recovered from the chamber.

At the Olcote kerbed cairn, also on Lewis and a few km north of the Calanais ritual complex, a huge assemblage of quartz was recovered (Neighbour 2005). Warren & Neighbour describe the site's complex formation processes, with some residual worked quartz deriving from contexts beneath the cairn, finer pieces were deposited within the monument, and it may have been carpeted in crushed quartz (Warren & Neighbour 2004).

As mentioned above (Section 4.3.3), several of the arrowheads found at Calanais are in 'greasy' quartz,

which may have been imported into the island. Outside the assumed source area, near Shieldaig on the mainland, this resource may have been saved for the production of more prestigious objects, such as arrowheads and other sophisticated forms. It is not possible to assess how many of the artefacts deposited in the Olcote cairn are in this material, as the quartz was classified according to a different type schema (ie not corresponding to that presented in Table 16).

The carpeting of the Olcote cairn in quartz is thought, by the excavators, to reflect the striking visual attributes of this material. In this case crushed quartz was used, but in other cases raw pebbles were used. Worked quartz or raw pebbles have been used in burial/ritual contexts throughout the western and northern parts of the British Isles as either capping/revetment of chambered tombs (eg Newgrange: O'Kelly 1982, plate VII), kerbing of cists (eg Glen Luce, Galloway: Lebour 1914, 121), interior paving of chambered tombs (eg Nether Largie, Argyll: Henshall 1972, 97) or cists (eg Burgie near Forres, Moray: Lebour 1914, 123), or quartz may have been deposited as small caches (eg Walton Farm, Dunbartonshire: Henshall 1972, 422).

In a number of cases, quartz, or quartz-rich boulders, formed structural elements of monuments: on Man small mounds consisting almost exclusively of quartz are common (Pitts 1999), and at Glecknahavill and Clach na Tiompan, both Argyll, quartz-rich boulders were incorporated into the monuments (Henshall 1972, 97), as was also the case at Balnuaran of Clava in Inverness-shire (Bradley 2000, 126). At the latter site, two different lithic industries, both dominated by quartz, were identified (Bradley 2000, 85). Stratigraphical observations suggest that at least the quartz from the north-east passage grave was deposited after the erection of the monuments, probably as part of rituals carried out around the megalithic graves.

Though most of these quartz-bearing Scottish, Manx and Irish sites are of Neolithic or Early Bronze Age dates, later prehistoric British and European monuments with quartz deposits are also known. A possible Later Bronze Age or Iron Age mortuary house was investigated at An Dunan on Lewis, and during the investigation unmodified quartz pebbles were recovered (Burgess *et al* 1997; Warren & Neighbour 2004). At Lilla Sylta 87 in central Sweden (Andersson 2004), a number of Migration Period graves were unearthed, many with crushed quartz. Apparently, the quartz was incorporated into the grave fill, and in one case as much as 59kg of this material was recovered from a single burial. In historic times, pebbles were placed in graves in south-west Scotland (Lebour 1914).

Most analysts favour the interpretation that quartz was used in burial or ritual contexts because of its striking visual attributes (Lebour 1914; Bradley 2000; Darvill 2002; Warren & Neighbour 2004), that is, its whiteness. That the colour white had particular importance to prehistoric people is supported by the fact that, in areas where quartz is rare, such as Denmark, white-burnt flint may have been used in the same manner. In the megalithic chamber of Klokkehøj near Bøjden, on Funen (Thorsen 1980, 112), burnt flint formed a thin layer on top of a paved floor. The question, then, is what the white quartz symbolized, to make it particularly suitable for deposition in graves and ritual contexts?

There is probably little doubt that the moon and its cycle played an important part in the belief systems of many prehistoric peoples, and it is thought that many stone circles ('plain', as well as recumbent) were orientated in a way that allowed them to be used as a form of lunar calendars (Bradley 2004). Burl suggests that the quartz may itself have been associated with the moon as prehistoric people possibly:

> ...saw, in the litter of quartz that glittered so brilliantly in the moon light fragments of the moon itself. The same connections between quartz, moon and death may have led to the frequent deposits of quartz and white pebbles with burials in prehistoric Britain (Burl 1980, 196).

Warren & Neighbour support this interpretation, and they refer to the recumbent stone circle at Strichen, Aberdeenshire (Warren & Neighbour 2004), where a crescent-shaped deposit of quartz pebbles was placed opposite the recumbent stone (also see Burl 1995, 107–9).