PROCESS, FORM AND TIME: MACEHEADS IN AN ORCADIAN CONTEXT

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INTRODUCTION

It is nearly 50 years since Fiona Roe published her typology of stone maceheads, and nearly 40 since she presented a comprehensive typology of perforated stone implements from the British Isles (Roe 1968; 1979). Fiona's attention to detail and her rigorous collection of data from across Britain have ensured that her typologies have stood the test of time, informing more recent research on Irish and Orcadian maceheads (Eogan & Richardson 1982; Fenwick 1995; Simpson 1988; 1989; Simpson & Ransom 1992; Ransom 1994). However, there remains a good deal that we do not yet know about these remarkable artefacts; questions of raw material choice and technology, of context and chronology. These questions have been targeted as part of an ongoing research project on Orcadian stone tools. Our work so far has resulted in the creation of a new corpus of stone maceheads from the archipelago, increasing Simpson and Ransom's 1992 total of 64 to 101. Eighty-nine of these artefacts have now been recorded in detail and a full catalogue will be available online at www.orkneystonetools.org in early 2017. This paper explores a number of issues arising from our review of Orcadian maceheads, focussing on raw material choices, processes of manufacture, variations in form and new dating evidence.

RAW MATERIAL: PROPERTIES AND SOURCES

Maceheads are some of the most beautiful prehistoric stone tools known. Frequently banded and speckled in high contrasting colours, the use of visually striking rock is complemented by their strong, fluid form. The criteria for selecting raw materials for maceheads appear to have been carefully balanced between aesthetics and physical properties. Hardness and durability were consistently important, with the vast majority of selected raw materials being particularly hard and free from flaws and planes of weakness. Friable stones were excluded. The ability of a rock to take a good polish was also significant. High-grade metamorphic rocks, particularly gneiss, were often selected, but medium to coarse igneous rocks also feature. However, volcanic dyke rocks such as Camptonite, commonly used in Orkney for axeheads and carved stone balls, and sedimentary rocks, such as sandstones, were rarely used.

Aesthetics

Aesthetic concerns are suggested in several ways. There are only a few plain (12) or virtually plain (5) examples, but highly patterned rocks (79 examples) feature heavily. Patterning commonly takes the form of speckling (24) or banding (13), often with

high contrasting minerals, but most frequently with speckling and banding occurring in combination (36 examples). Mottled (4) and veined (1) patterning occurs on a small number of maceheads. Colours are carefully selected, with numerous examples of white patterning on a black background or *vice versa*. Combinations of black or white with green and/or grey are common, while orange or orange/brown features only occasionally. White quartzites appear not to have been used, but are an uncommon and fairly intractable material. By contrast, red igneous and metamorphic glacial erratics are common in Orkney, but no macehead is manufactured from a bright red stone, although red mottling is present on both flint maceheads.

Figure 7.1: A cushion macehead from Grind, Tankerness, Mainland (OM 1985.66). As with many Orcadian cushion forms, this example is widest at its front end and manufactured from a plain igneous rock. Image: Hugo Anderson-Whymark, © Orkney Museum.

Aesthetic and raw material choices vary with different macehead forms. Cushion maceheads are commonly manufactured from igneous or sedimentary rocks, or

metamorphic rocks of a fine crystalline structure. They are predominantly muted colours, such as greys and greens, following Gibson's (1944, 18) observations for Britain as a whole. A significant proportion of cushion maceheads from Orkney (31.8%: 7 of 22) were manufactured on plain rocks of a uniform colour (Fig. 7.1). In contrast, only 10% (5 of 50) of the other, finished, maceheads were manufactured from plain or almost plain rocks. Only one was a pestle (3%: 1 of 31). Colour and texture choices for many cushion maceheads are thus broadly similar to axeheads (see Clarke 2011 for a discussion of Orcadian axeheads), perhaps suggesting a degree of blurring between these artefact categories. A small number of Orcadian axeheads even have some morphological similarities with cushion maceheads, being relatively narrow and parallel-sided. However, axeheads with these characteristics were also made on visually striking raw materials, so it may be best, for now, to treat these correspondences with caution.

Sources

The rarity (or uniqueness) of the raw material was significant. Many of the selected rocks are geologically uncommon, often of unknown source, and only a few groups of comparable raw materials can be identified. Rocks were selected for their individuality and personality. Precise sources remain enigmatic, but it is likely that maceheads were both manufactured in Orkney and imported. The importation of maceheads (or at least raw materials) is evidenced by four pestle maceheads of Lewisian Gneiss, all of which were found in the environs of the Brodgar monument complex (SM A187; NMS Dounby unreg. 55/2; Ness of Brodgar SFs 16208 and 16640). This raw material is not closely sourced, but can only be obtained from north-west Scotland and the Hebrides, indicating a western seaways connection. A Shetlandic link may be indicated by a fragmentary cushion macehead reportedly of Riebeckite felsite found at Millfield, Stronsay (OM 1981.163).

A burnt and broken fragment of a once fine and highly polished flint pestle macehead from Bockan Farm (NMS X.AH 180) is likely to have been imported (Fig. 7.2). It is manufactured from a distinctive mottled white/red flint that has not been found in Orkney despite extensive sampling of coastal deposits. Notably, this raw material was also used for several *Maes Mawr* style maceheads that have been found across Britain and Ireland, including the exquisite example from Knowth passage grave (Anderson 1909, Eogan and Richardson 1982, Fenwick 1995). A non-Orcadian origin may also be suggested by a small number of maceheads, manufactured from very distinctive raw materials of unknown source. These include a cushion macehead of an unusual form for the region, being widest in the centre, from Smoogro manufactured from a coarse, green, plagioclase amphibolite. Similarly, the distinctive raw materials of the pestle maceheads from Bay of Stove (SM A287) and Dale, Grimiston are without parallel in Orkney. These are two of the finest maceheads from the archipelago. This may not have any particular bearing on their source, but it does suggest that very distinctive rocks were accorded special treatment during manufacture. *Glamour* evidently mattered (Fig. 7.3).

Figure 7.2: A highly polished pestle macehead from Bockan Farm, Mainland manufactured from a mottled white/red flint (NMS X.AH 152). The artefact has been burnt, altering the colour to grey/red. Image: Hugo Anderson-Whymark. © National Museums Scotland.

Figure 7.3: Two pestle maceheads manufactured from visually striking rocks. SM A187 from a cist on Dounby Farm, Mainland is manufactured from Lewisian Gneiss (left) while SM A287 from Bay of Stove, Sanday is manufactured from an unidentified metamorphic rock. Image: Hugo Anderson-Whymark, © Stromness Museum.

For the majority of maceheads, however, the raw material was probably obtained in Orkney. The Boulder Clay in the Northern Isles, particularly Eday, Stronsay and North Ronaldsay, and Deerness, east Mainland, contains a wide variety of igneous and metamorphic cobbles, many of Scandinavian origin (Smed 1994). Field collection by the authors has recovered various rock types comparable to materials used for Orcadian maceheads. These rocks can be obtained directly from the cliffs, although they are more easily recovered from local beach deposits. The Granite Schist basement rocks exposed at Stromness and Yesnaby on west Mainland do not appear to have been used as a raw material, possibly on account of their common occurrence and their colour (a pinkish orangey red), but veins of pale, almost white, rock may have been exploited (e.g. possibly NOB SF19201). The few examples of maceheads manufactured from sandstone and volcanic rock employ raw materials readily available from Orkney, and flint comparable to the material used for the naturally perforated flint macehead (SM unreg.) is found in the Northern Isles.

MANUFACTURE

Eighteen maceheads from Orkney are unfinished and survive in various states of manufacture, providing insights into *chaînes opératoires*. Techniques are outlined in sequence below, noting where differences exist between macehead sub-types and unfinished artefacts of the same class. All of the principal forms (*pestle, ovoid, Heatherbank-type* and *cushion*) also appear unfinished in Orkney, and it is interesting that the raw materials of unfinished maceheads are less diverse than those of finished forms, with many distinctively patterned materials all but absent. Many maceheads abandoned at the earliest stages of manufacture are on comparatively plain materials. This pattern is difficult to explain, but may indicate that there was more commitment to see individual-looking materials through to completion or, alternatively, that particularly distinctive examples arrived as finished objects.

The distribution pattern of unfinished maceheads is particularly striking. On Mainland, unfinished forms represent 24.6% (17 of 69) of all maceheads, but on other islands 44.4% (8 of 18) are unfinished. This pattern is particularly pronounced in the Northern Isles where 56.3% (9 of 16) of maceheads are unfinished, including *all* of the forms known from Westray, Eday and North Ronaldsay. This may indicate the location of manufacture in Orkney, and it is worth noting that most exotic Scandinavian erratics are largely confined to the Northern Isles. However, current distributions are an artefact of recovery patterns biased towards particular areas and types of site (such as structures in the Stenness-Brodgar monument complex), and cannot be taken entirely at face value.

Blank selection

In Orkney, most macehead blanks were sub-angular to sub-rounded cobbles from Boulder Clay or nearby beach deposits. More distant materials such as Lewisian Gneiss may have been obtained as beach cobbles or as angular blocks from outcrops. The specific criteria used to select raw materials would have meant that a

considerable amount of time was expended searching for the 'right' cobble or piece of rock. In our experience of searching some 300 beaches on 20 islands across the Orkney archipelago, it is rare to find a cobble of the right raw material in convenient size and shape to manufacture a macehead. This raises an important point of difference with battle-axes, which are typically made on appropriately shaped cobbles of commonly available raw material, often retaining the shape of the original cobble (Fenton 1984). For the vast majority of maceheads, a distinct mental template has been imposed on the rock and the original form of the blank or cobble is lost. That said, the influence of raw material form is sometimes identifiable in ovoid and Heatherbank-type maceheads (e.g. Heatherbank, Westray: Fig. 7.4). The flattening of pestle and ovoid forms may also reflect constraints in the form of cobble blanks.

Field survey makes it clear that the maximum size of Orcadian maceheads (143mm for cushion forms and 110mm for pestles) is not a function of raw materials. Larger erratics can be found, suggesting a consensus or expectation about the 'right' size for a macehead. This was not a rigid rule, however, and the small size of some pestle and ovoid maceheads suggests that the visual properties of stone cobbles sometimes mattered more than size. An unprovenanced macehead from James Cursiter's collection (GLAHM B.1914.240) provides a good case in point as it is has a strong ovoid 'b' form, but measures only 68mm long. In this case, the striking raw material was perhaps too good to overlook, despite its limited size. It should also be noted that many metamorphic cobbles contain natural flaws creating lines of weakness. Examination of finished and unfinished maceheads indicates that raw materials with such flaws were typically rejected before manufacture began; an ovoid macehead from Westness, Rousay, and an unfinished ovoid from Birsay (GLAHM B.1914 554) are the only exceptions.

Preliminary polishing

Following selection of an appropriate cobble, the first stage of manufacture was the polishing of a part or the entire cobble surface. All of the unfinished maceheads that retain part of the original cobble surface exhibit this stage of manufacture, despite the fact that this surface would have been subsequently removed by shaping (e.g. Fig. 7.4). This initial polishing of a blank served two purposes. It revealed the appearance of the stone giving a good indication of the character of the finished surface. It also exposed very fine flaws in rock that may be missed on visual inspection, making it a useful step in the 'screening' process for blanks.

Preliminary shaping

The preliminary shaping of maceheads was in all cases undertaken by pick dressing. Judging by the fine indentations on the surface of unfinished artefacts, this was achieved with a small hammerstone. The process is quite expedient; experimental work by Fenton (1984) showed that quartz dolerite cobbles could be pick dressed into battle-axe and axe-hammer forms in 3-5 hours. However, raw materials for maceheads are typically harder than quartz dolerite, increasing the amount of time

and effort required to the extent that this stage of working may have extended across a couple of days.

Figure 7.4: An unfinished 'Heatherbank-type' macehead from Heatherbank, Westray (NMS X.AH 129). The surviving area of the cobbles surface was polished before the form was shaped by fine pecking. Image: Hugo Anderson-Whymark. © National Museums Scotland.

Perforation - boring

The position of the perforation is marked on all but one unfinished macehead by small pick dressed indentations on each side of similar diameter to completed perforations but between 1mm and 5mm deep. This mark was presumably used as a reference point in manufacture for the main axes of the macehead, ensuring that the form was reduced to the appropriate shape. Deeper indentations were also presumably used to hold the drill bit when drilling was initiated. The point in production at which boring of the perforation commenced varies. Some

macehead blanks at an early stage of preliminary shaping exhibit comparatively deep perforations (e.g. GLAHM B.1914.580 from Firth, Mainland), while in other examples a fine shape and surface finish had been achieved before the perforation was started (e.g. Ness of Brodgar, Structure 10, SF13461).

On all unfinished maceheads save one, the perforation has been worked from both sides, with boring proceeding at a broadly similar rate. The unfinished perforations are all U-shaped, indicating the use of a solid drill-bit, and horizontal striations are frequently visible, suggesting a rotary drill-bit, probably of wood, used in conjunction with an abrasive, such as sand or fragments of flint or quartz (see Fig. 7.5). This drill may have been operated by hand or by using a strap or bow (Fenton 1984, 227). Experimental work (ibid.) revealed drilling to be the most time consuming part of the manufacturing process. When drilling, Fenton achieved a rate of around 2.5mm per hour, which considering that the average thickness of a macehead at the perforation is 35.8mm, equates to *c*14 hours of work. However, as maceheads are typically made of a harder material to that worked by Fenton this time estimate is a minimum. The boring process appears to have presented many challenges. The misalignment of bore-holes from each side was observed in a number of cases, while in other examples the hole was moved off centre during drilling and required repositioning.

Final shaping and grinding of the surface

The final shaping and grinding of the surface, and finishing of the perforation are essentially part of the same process, but are described separately to highlight the importance of each. These final stages involved refinements to the shape and preparation of the surface for polishing. In all examples this stage occurred after the perforation has been bored, with the notable exception of the Orkney pestle from Ness of Brodgar (Structure 10, SF13461) and an unfinished pestle with a polished surface from Sanday (GLAHM B.1914.813). At this stage, refinements were largely concentrated on the surface surrounding the perforation, as boring typically results in a rounded lip. A crisp sharp edge to the perforation was created by the careful pecking of the surface around the mouths of the hole (e.g. Heatherbank, Westray: Fig. 7.4), and/or by the reduction of the faces by grinding (e.g. Dounby, Mainland: NMS unregistered 55/2 and many others), in conjunction with the grinding of the perforation itself. The grinding of the faces around the perforation can result in a slightly concave surface (e.g. Dounby Farm: SM A.187) or a flattened facet on the domed faces commonly found on cushion maceheads. The grinding of the entire surface to a smooth matt finish covered in striations also occurs at this stage. Two Orkney maceheads were left at this stage (Bloody Quoy cushion NMS X.AH 89 and Muckquoy pestle butt). The process of grinding is likely to have involved several phases of work with increasingly fine abrasive stone.

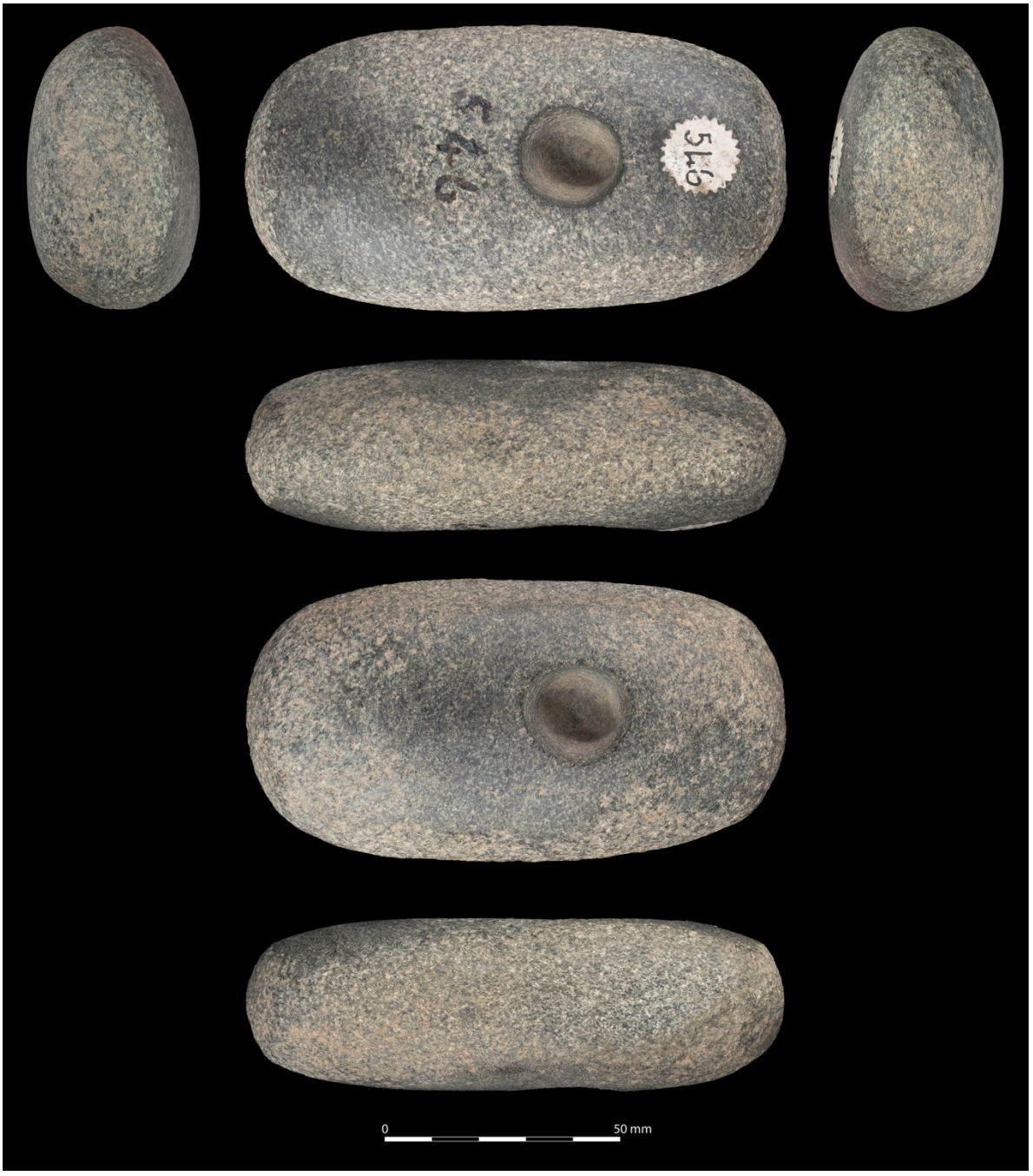

Figure 7.5: An unfinished ovoid macehead found on a beach in Shapinsay (OM 546). This artefact exhibits a polished surface partly removed by fine pecking and a U-shaped perforation initiated from both sides. Image: Hugo Anderson-Whymark, © Orkney Museum.

Perforation – grinding and finishing

Boring rarely results in a perfect parallel-sided perforation. Unfinished examples show that the edges were seldom straight, that the bores from each side were misaligned, or that the edge at the mouth was rounded to some degree. Finishing the perforation involved removing these irregularities by grinding. Perforations on all finished maceheads, with the exception of a particularly flawed example from Rinyo, Rousay (NMS X.HDA 278), underwent this process. The majority were ground following boring and exhibit clear longitudinal striations. The tool used for this process has not been identified archaeologically, but was probably a narrow rod of

abrasive sandstone. This frequently removes all trace of the original bore and creates a parallel-sided to slightly convex perforation. Occasionally the perforation expands at its centre and this may be due to a misaligned bore that has been ground out. Roe (1968) however, considered an internal expansion as an early chronological indicator, as recorded on antler maceheads. The process of grinding also widens the perforation and, in conjunction with surface finishing, forms a sharp edge at the mouth of the perforation. The internal surface of the perforation was finished by polishing, with a finish equal to or exceeding that of the final surface. A macehead from Muckquoy has a polished perforation and an unfinished surface, indicating that this polishing could occur as a distinct event, in this case prior to the final surface polish. The sharpness of perforation edges and precision of the finish of the perforation may have aided hafting, but equally this attention to detail may emphasise aesthetic concerns.

Polishing

The final polishing of the surface frequently removes all traces of the striated ground surface, typically resulting in a moderate to high surface polish. In a small number of examples, a very high, glassy, polish was achieved, most notably on the flint pestle macehead from Bockan Farm (NMS X.AH 180; Fig. 7.2) and the Orkney Pestle from Dounby Farm (SM A187). It is not known what techniques were used, but experimental work has produced a surface polish by various methods, such as gently grinding an implement in quartz sand against a block of softer stone or rubbing the surface with a wet quartzite or limestone cobble (Fenton 1984, 230).

Manufacture: general observations

The pattern of manufacture observed on unfinished Orkney maceheads provides a rare insight into the range of skills involved. With the possible exception of perforation, none of the skills required were particularly specialised and many were exercised in the manufacture of other classes of tool. However, maceheads required a high degree of care and precision, and considerable time, effort and attention to form invested in each part of the process.

The wide distribution of unfinished forms indicates that these artefacts are unlikely to have been produced by a workshop or distinct group of craftspeople. Indeed, the wide range of stages at which manufacture ceases may suggest a very individual and drawn out process of manufacture; an artefact could have taken years to produce. With that in mind, it is possible that the significance of maceheads lay in the mix of people and places they encountered during the manufacturing process. A single macehead may have passed through several hands during the process of manufacture, gaining biographical associations along the way. In this respect, our distinctions between finished and unfinished artefacts may require revision; the process may have had no end, only pauses. Whether they changed hands or not, some may have been worked on throughout their lives, modifications manifest as refinements to form (e.g. strongly concave surfaces) or enhancement of surface finish (e.g. brilliant polishing). It is notable that some of the most refined and highly

finished maceheads are manufactured on the more 'exotic' raw materials, including banded Lewisian Gneiss. Artefacts that had travelled a considerable distance from source may have had elaborate and extensive biographies.

CHRONOLOGY

When Fiona Roe formulated her typology, few maceheads had been recovered from secure archaeological contexts. A relationship with later Neolithic Grooved Ware (then defined as secondary Neolithic Rinyo-Clacton pottery) had, however, been demonstrated by Stuart Piggott (1954) in a cairn at Tormore, Arran and more loosely at the settlements of Rinyo, Rousay and Skara Brae, Mainland, Orkney. In reviewing the evidence from Orkney, particularly discoveries in recent excavations at Barnhouse and the Ness of Brodgar, strong associations can now be demonstrated between maceheads and Grooved Ware-associated later Neolithic sites dating from *c*3200-2400 BC. This broad date range is likely to be refined by ongoing radiocarbon dating programmes and Bayesian modelling by Prof Alasdair Whittle and colleagues to refine the chronology of Grooved Ware in Orkney. Twelve maceheads have been recovered from stratified deposits and an additional 13 have been recovered from less secure contexts, primarily topsoil, on known later Neolithic sites (Table 7.1). Two maceheads have been recovered from Orkney-Cromarty tombs at Taversoe Tuick, Rousay and Isbister, South Ronaldsay, but in both cases deposition cannot be related to their earliest Unstan Ware-associated phases of use. The macehead from Taversoe Tuick was recovered in three fragments from the passage of the tomb and both early and later Neolithic artefacts were present in the assemblage. The example from Isbister was recovered in a cache of artefacts placed outside the tomb, comprising the macehead, three axeheads, a polished silicified sandstone knife and a V-perforated jet button; the latter may have been used to secure a bag containing the other items. The V-perforated button dates from the Early Bronze Age, and a Bronze Age jet ring was also found close by, indicating that this cache was deposited when most of the artefacts were of considerable antiquity. In addition, two maceheads have been recovered from undated graves at Dounby Farm, Sandwick, and 'Whitlid', Stronsay, which may plausibly date from the later Neolithic or early Bronze Age.

The absence of any securely stratified pre *c*3200 BC maceheads in Orkney (from Orcadian early Neolithic sites), or antler precursors (Knap of Howar perforated antlers excluded), indicate that maceheads were not an indigenous development. They reflect influences from southern Britain or Ireland, perhaps alongside other stoneworking traditions such as the *Levallois* technique. The large number of maceheads from Orkney compared to other regions does however indicate that they assumed a significant regional status in the later Neolithic. Securely stratified artefacts also indicate that the currency of the 'early series' of maceheads is largely confined to the later Neolithic, although the cache at Isbister and possibly the two examples from graves may indicate that a small number of maceheads remained in circulation in the early Bronze Age. On mainland Scotland, a further example of the continued circulation of maceheads in the early Bronze Age was demonstrated at

Glenhead, near Doune, where an Orkney pestle was found with a food vessel in a grave within a cairn (Anderson 1883, 452). Moreover, the early Bronze Age Largs-type maceheads while typologically distinct (with central hour-glass perforations), draw on earlier Neolithic traditions in their general morphology. Two early Bronze Age maceheads are known from Orkney, a classic Largs-type was found on Rousay while an atypical example with hemispherical faces and an hourglass perforation was recovered from the Broch of Lingro; neither has a secure provenance.

Site	Artefact	Description
Later Neolithic occupation/settlement sites. Stratified finds.		
Barnhouse, west Mainland	Cushion macehead (fragmentary)	Recovered from a later Neolithic midden behind House 6 (Richards 2005)
Barnhouse Odin, west Mainland	Unclass. pestle or ovoid macehead (fragmentary)	Recovered from an old land surface that contained flint and Grooved Ware at Barnhouse Odin; a hearth was located nearby (Richards 2005)
Ness of Brodgar, Trench P, west Mainland	Three cushion maceheads (fragmentary), two pestle maceheads (fragmentary), one unfinished pestle macehead and one possible macehead blank.	Three fragmentary cushion maceheads from occupation deposits in Str. 8, two fragmentary pestle maceheads from a later Neolithic midden deposit outside Str. 1, a complete unfinished pestle macehead from secondary occupation deposits in Str. 10 and a possible roughout macehead from occupation deposits in Str. 14
Smerquoy, west Mainland	Unfinished ovoid 'b' or 'c' macehead (fragmentary)	Recovered from a later Neolithic occupation horizon in an earlier Neolithic structure.
Skara Brae, west Mainland	Cushion macehead (flake from)	A small fragment of a recovered from the later Neolithic upper midden deposits. Animal bone from this context yielded two radiocarbon dates BIRM-433 3830±10 BP and BIRM-434 4020±110 BP (Smith 1979, 15)
Tofts Ness, Sanday	Unfinished ovoid 'b' or 'c' macehead	Recovered from a later Neolithic midden deposit
Later Neolithic occupation/settlement sites. Unstratified finds.		
Barnhouse, west Mainland	Two fragmentary cushion maceheads	Recovered from plough soil over the later Neolithic structures
Muckquoy, Firth, west Mainland	Fragments of a pestle macehead and a possible Heatherbank-type macehead	Recovered from topsoil during fieldwalking of a later Neolithic occupation site
Green, Eday	Unfinished pestle macehead and a second unclassified macehead fragment	Recovered from topsoil near the early and later Neolithic settlement.
Ness of Brodgar, Trench J, west Mainland	Cushion macehead	A fragment of a cushion macehead from topsoil
Rinyo, Rousay	Two pestle maceheads (fragments)	recovered from excavations on the later Neolithic settlement
Braes of Ha'Breck, Wyre	Unfinished macehead (fragmentary) and a Heatherbank-type macehead (fragmentary)	Both maceheads were recovered from topsoil while fieldwalking the early and later Neolithic settlement site
Bay of Stove, Sanday	Pestle macehead	A pestle macehead was recovered close to the probably later Neolithic settlement eroding from the cliff
Tofts Ness, Sanday	Pestle macehead (fragmentary)	A fragmentary pestle macehead was from Iron Age deposits overlying the later Neolithic settlement site
Graves/cists		
Dounby Farm, Sandwick, Mainland	Thames pestle macehead	A complete pestle macehead of Lewisian Gneiss was found in a cist containing a crouched burial in 1839
'Whitlid', Stronsay	Ovoid 'B' macehead (fragmentary)	A fragmentary pestle macehead found 'in a grave' at 'Whitlid', an unlocated location on Stronsay (Muir 2002)
Tombs		
Taversoe Tuick, Rousay	Orkney pestle macehead (fragmentary)	Three quarters of a fine pestle macehead found in the passage of the chambered tomb; the date at which the macehead was deposited is open to debate as the tomb contains both early and later Neolithic flint artefacts.
Isbister, South Ronaldsay	Orkney pestle macehead	A complete pestle macehead was found with three axeheads (including one of haematite), a polished chert knife, and a jet V-perforated button, found in a group by the southernmost wall of the tomb (Hedges 1983, Ritchie 1959)

Table 7.1: Maceheads from Orkney with associations to archaeological sites.

FORM

Recent dating evidence from Orkney, combined with a detailed review of artefact morphology, allows us to refine Roe's typology. Roe (1979) considered that the finest pestle and cushion forms probably evolved from ovoid forms. The dating evidence from Orkney now indicates that these forms are all contemporary in the Orcadian late Neolithic. This new evidence does not affect the typology, but it does call into question that there was necessarily an evolutionary or developmental refinement of form over time. Our new dates also show that the loosely defined term 'proto-cushion' (Roe 1968, 163), which has been widely misused, should no longer be used for certain flattened or elongated ovoid 'c' forms.

This study has not been able to refine further the classification of ovoid maceheads into three types ('a', 'b' and 'c'), which Roe achieved using two metrical attributes: 1. the position of the widest point along the length of the artefact and, 2. the thickness of the artefact in relation to its length. In a number of Orcadian examples, the overall form of ovoid maceheads was broadly comparable to pestle forms, although lacking the front facet. It may be that many ovoid forms are essentially part of the same series as pestle maceheads, any differences being a function of the form of the cobble raw materials used.

Our work also indicates that centrally perforated maceheads with parallel-sided perforations, which under Roe's typology would be classed as Late Series 'Bush Barrow' forms, date from the later Neolithic in Orkney. The name 'Heatherbank-type' has been used to distinguish these maceheads in the current study. The reasons for proposing a revised date are twofold. Firstly, although no securely stratified examples have been recovered, two fragmentary Heatherbank-types have been recovered from topsoil on the Neolithic sites at Braes of Ha'Breck, Wyre and Muckquoy, Mainland. Secondly, a detailed analysis of the manufacturing techniques, particularly the form and finish of the parallel-sided perforation, indicate that these forms are the product of the same technological tradition. The hour-glass perforations of the securely dated *Largs* forms, and frequently the surface finish, are significantly different and compare well to manufacturing techniques for battle axes (cf. Fenton 1984). Further work is required outwith Orkney to characterise early Bronze Age 'Bush Barrow'-type maceheads and determine if examples with parallel-sided perforations in early Bronze Age contexts are curated Neolithic artefacts.

Two flint maceheads from Orkney also warrant comment. The example on a naturally perforated flint cobble is the first of this type from Orkney and only the second from Scotland; the other being from the River Tay (Roe 1971). This class of macehead is more commonly associated with south-east England, most notably finds from the River Thames. The raw material for this artefact is, however, clearly Orcadian, and the front face of the artefact has embraced the sculptural form of the stone, drawing comparison with carved stone balls (Fig. 7.6). The possibility of a long distance influence from southern Britain must be considered. The second flint

macehead was made from a distinctive mottled white-red flint. While clearly a pestle form, the raw material associates it with the *Maes Mawr* group of maceheads.

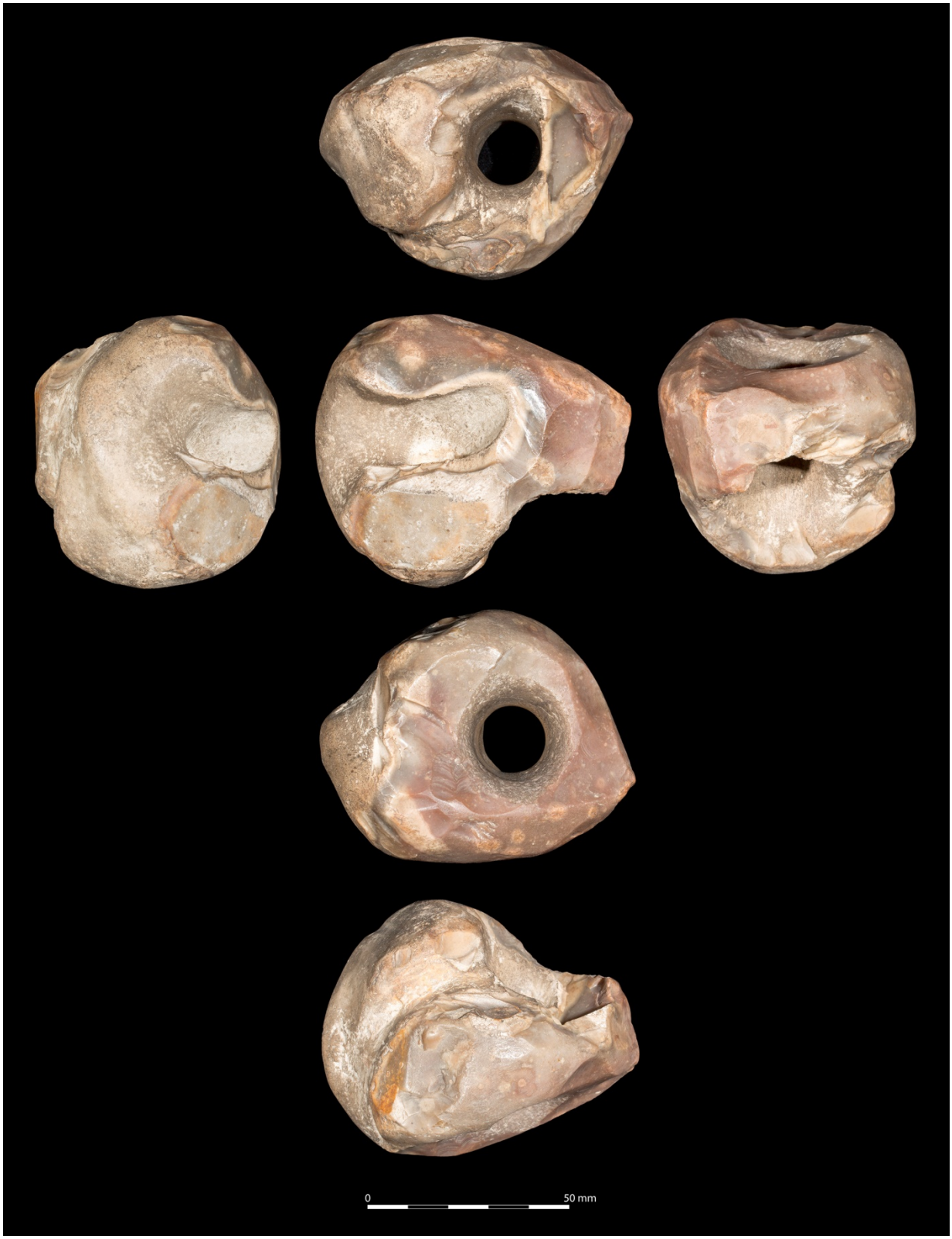

Figure 7.6: A naturally perforated flint macehead probably from Orkney (SM uncat.). Flint of this type is found in the Northern Isles. Image: Hugo Anderson-Whymark, © Stromness Museum.

Non-metrical attributes are another area of macehead typology with great potential for the study of regional variation. Roe (1968) observed that pestle maceheads can be divided between forms with concave sides and those with straight or slightly convex sides, noting that the former were more common in Orkney, while the latter were more characteristic of examples from the River Thames. Although their distributions are not mutually exclusive, Roe identified these as 'Orkney' and 'Thames' sub-types. Combined with raw material studies, these subtle differences in morphology allow us to identify regional and sub-regional variation. For example, the widest point on most Orcadian cushion maceheads is commonly at the blade edge; elsewhere, it tends to be towards the middle (Marshall 1946). There are hints here of local conventions, and once recognised, it becomes possible to identify departures, such as the cushion form from Smoogro, Orphir, which more closely resembles maceheads from other regions. Then there are the only two pestle maceheads from Orkney that exhibit straight sides with concave upper and lower faces. This unusual combination is just one of many parallels: both pestles were manufactured from Lewisian Gneiss, both are from Dounby, west Mainland (NMS unregistered 55/2 and SM A187; Fig. 7.7) and they are the two smallest pestle forms from Orkney, measuring 66.2mm and 77.1mm long. It would take special pleading to argue that these correspondences are coincidental, and in that light we should be asking new questions. Were these pestles imported as raw material or as finished forms? How does their form and size compare to examples from north-west Scotland? Were these two maceheads reworked and reshaped over their lives in Orkney? And, what does this pairing tell us about the relationship between local, regional and wider patterns of production and consumption? Our work so far suggests a significant potential for future research along these lines.

FUNCTION: USE AND BREAKAGE

In 1911, Reginald Smith introduced the term of 'mace-head', in an explicit departure from the functional 'perforated hammer' or stone 'hammer-head' favoured by Victorian antiquarians. The ceremonial associations of his term went largely unchallenged in the 20th century to become the default interpretation (Callander 1930, 19). However, this designation was based principally on aesthetics and rarity without consideration of use-wear patterns. In order to redress the balance, we have undertaken a detailed systematic examination of the surface of each Orcadian macehead, noting all possible traces of use-wear. Of the 89 complete and fragmentary maceheads examined, 31, including four unfinished forms, exhibited one or more traces of use-damage visible to the naked eye, while a further eight, including two unfinished forms, exhibit possible use-damage. This use-wear can be divided into three broad categories: impact damage to the front or rear surface; areas of pecking on the polished surface; and use on broken surfaces (Fig. 7.8).

Figure 7.7: A pestle macehead from a cist on Dounby Farm, Mainland manufactured from Lewisian Gneiss (SM A187).

Impact damage

Seventeen maceheads exhibit definite or possible use-wear on their front or rear surfaces. From the outset it is necessary to consider four unfinished forms separately, as three exhibit extensive damage on their ends from use as hammerstones (e.g. GLAHM B.1914.580), while the other exhibits a small, flat-ground facet on its front face (ORCA Braes of Ha'Breck). The latter is stained red and may result from

grinding haematite (note: a small red patch also exists on the surface of NMS X.HA 701, although it is unclear if this results from haematite or an old collection mark).

Figure 7.8: The three principal forms of use-wear on maceheads. 1. Impact damage on a pestle macehead from Dounby Farm (SM A187), 2. Surface pecking on cushion macehead from Wasdale, Firth (also note extensive edge damage: OM 2014.17), and 3. Use-wear on the broken surface of a pestle macehead from West Puldrite, Rendall (NMS X.AH 254). Image: Hugo Anderson-Whymark, © Orkney Museum, Stromness Museum and National Museums Scotland.

The ten finished forms that exhibit use damage and three with possible use damage, comprise six pestles, five ovoid forms and two cushions. Seven of the artefacts which exhibit this form of use-wear are complete, and these include some of the finest forms (e.g. SM A187 see Fig. 7.7, SM A287, GLAHM B.1914.242 and OM 1985.66). In general the use damage consists of very slight 'pock' marks on the front face (8 examples) or the rear face (2 examples and 3 possible examples). This damage is consistent with these tools being used as hammers, in some cases against a hard enough material and with enough force to cause minor injury to the surface. A cushion macehead from Wasdale, Firth (OM 2014.17) exhibits very extensive battering at both ends as well as pecking, considered below. The degree of use-wear on this artefact is far in excess of any other macehead, though as a surface find, we cannot determine if this use occurred in the Neolithic or later.

Surface pecking

Sixteen maceheads had surface pecking. Eight of these were complete, including three unfinished forms, while eight were broken fragments representing approximately half of a macehead. This damage typically took the form of one or more sub-circular areas of fine pecking <20mm in diameter, although some areas of pecking were more diffuse. The form of the damage is reminiscent of facially pecked cobbles (Clarke 2006) and may reflect the use of the surface as an anvil. Six of the examples exhibiting this use-wear were recovered on or close to known later Neolithic occupation sites.

Use-wear on broken surfaces

Twelve maceheads, eleven of which are broken across the perforation, exhibit wear on the broken surface that can only have formed by use of the artefact *after* breakage. The use-wear varies in character from small flat facets (e.g. NMS X.AH 33), and crushing/rounding of the edge (e.g. GLAHM B.1914.605) to extensive rounding and polishing of the surface (e.g. NMS X.AH 254). These variations probably result from combinations of hammering and grinding. Five of the forms exhibiting this use-wear were cushion forms, with smaller numbers of pestle (3), ovoid (2) and Heatherbank-type (2) forms. Three of these artefacts also exhibit surface pecking and one cushion (ORCA NOB08 SF2985) exhibits heavy abrasion on the front edge; it not clear if this occurred before or after breakage.

Breakage

In 1931, J G Callander observed that a large proportion of the maceheads from Orkney were broken; Fiona Roe (1968, 151) confirmed this pattern observing that 75% of the 24 ovoid and pestle specimens she examined from the archipelago were broken, comparing to only 23.7% of maceheads across the rest of Britain. In the current study, 74.4% (58 of 78) of finished maceheads are broken, while 22.2% of unfinished maceheads are broken (4 of 18). The broken finished maceheads comprise three examples that are substantially complete (including two reconstructed from broken fragments), 36 examples that represent approximately

half of an artefact (typically a butt or front end; these are present in equal proportions) and 19 small fragments.

The pattern of breakage among finished maceheads differs between forms. Heatherbank-type maceheads exhibit the highest proportions of breakage (100%: 5 of 5 broken), followed by pestle maceheads at 83.9% (26 of 31), ovoid forms at 68.4% (13 of 19), cushion forms at 66.6% (14 of 21), while both Largs forms are complete. The pattern of breakage also differs in relation to the context of discovery. On known later Neolithic occupation sites 94.5% (17 of 18) of finished maceheads are broken: this includes seven broken maceheads from secure contexts and one complete and ten broken examples found on or in close proximity to these sites (See Table 7.1 for details). The only complete example was reputedly found at the Bay of Stove, Sanday, near to a coastally-eroding Neolithic site. In contrast, of the two maceheads recovered from graves, one is complete and the other may have been broken by the workmen who found it (Muir 2002). The two maceheads from chambered cairns include one complete example from Isbister and *c*75% of a macehead from Taversoe Tuick. Of the finds lacking provenance, 69.6% (39 of 56) are broken.

Further examination of the patterns of breakage revealed that in nine cases, maceheads exhibit 'fresh' fractures. Some of these breaks may be comparatively recent, edge fracture resulting from contact with agricultural machinery, but most are evidently of some antiquity. In the vast majority of cases, the break passed through the perforation, often cleanly halving the artefact. This pattern is not surprising as each side measures an average of only 14.4mm thick at the perforation (range 8mm to 20.9mm): a fundamental point of weakness.

It was only rarely possible to determine the manner in which the break was propagated. Some fracture patterns were indistinct, while weathering and subsequent use-wear on broken edges precluded identification on other pieces. Evidence of fracture initiated by an intentional blow was, however, detected on 10, possibly 12, artefacts. One of these was a cushion macehead (ORCA NOB11 SF8832) split along its long axis by a blow to one end and another was an ovoid 'a' or 'b' (NMS X.AH 183) fractured by an off-centre blow to the front. Eight of the deliberately broken maceheads were pestle forms: three were broken by blows to the edge of the front facet (ORCA NOB13 SF16208; Dale, Grimiston and NMS X.HA 173), one was broken by a blow to the edge of the butt facet (ORCA NOB13 SF16208), one was broken across the perforation by a blow to the side (GLAHM B.1914.558), one was broken by an impact to the centre of the front facet (OM 1985.134/1427) and two examples appear to have been split through their long axis by bipolar percussion (OM 1979.214 and NMS unregistered 55/2). Two possibly deliberate fractures are found on maceheads that have been repaired/conserved. The first is a Heatherbank-type (GLAHM B.1914.239), broken through the perforation. The second is the example from Taversoe Tuick, Rousay (NMS X.EO 378) which appears to have been quartered by a blow to the front face, with other fractures positioned at right

angles through the perforation. The repair of these fragments precludes detailed examination of the fracture pattern. The cause of breakage for the remaining artefacts is less clear, but in many cases the artefact was split transversely across the perforation. Although this is the weakest point of the artefact, it remains difficult to explain how a fracture of this type occurs during use. A tight wooden handle could potentially cause a fracture if it were to get wet and expand, but deliberate breakage remains a strong possibility.

Figure 7.9: An Orkney pestle macehead from Taversoe Tuick tomb, Rousay (NMS X.AH 180). This artefact appears to have been broken into quarters; the surviving butt quarter is burnt. Image: Hugo Anderson-Whymark, © National Museums Scotland.

Interestingly, the butt quarter of the Taversoe Tuick macehead was burnt after breakage raising the possibility that this occurred during deposition. Burning was only recorded on one other macehead fragment: the *Maes Mawr* style flint pestle from Bockan, Sandwick (Fig. 7.9). This was only slightly burnt, but the heating was sufficient to fracture the artefact. A macehead from Knowth passage grave, Ireland, also exhibited evidence of burning before deposition (Eogan and Richardson 1982).

Breakage patterns suggest that the vast majority of maceheads were broken during the Neolithic. Complete examples were deposited in cists and chambered tombs, but the deposition of these artefacts may be Bronze Age and at least one example was probably deliberately broken on deposition (e.g. Taversoe Tuick; Fig. 7.9). On later Neolithic occupation sites *only* broken maceheads appear to have been deposited, with one possible exception at the Bay of Stove, Sanday. Finished artefacts recovered from archaeological excavations can be divided between finds from middens and those within structures. The finds from middens include approximately half a cushion macehead (OM BH88 SF4412) but the four other examples are small fragments. In contrast, the three examples recovered from within Structure 8 at the Ness of Brodgar are larger, comprising two half cushion forms split across the perforation and *c*60% of a cushion macehead broken longitudinally. All three were deliberately placed close to walls or pier ends, the latter deposited with an animal bone. Other artefacts deposited in a similar fashion at the Ness of Brodgar tend to be complete, most notably axeheads.

CONCLUSIONS

This paper is an interim statement. However, our work so far suggests that there is more to learn about every stage in the biographies of these enigmatic artefacts. The choice of raw materials, principally individual glacial erratics, has long presented a challenge to implement petrologists seeking source areas. The present study has highlighted diversity in Orkney, identifying several imports and potential imports alongside the use of rocks drawn from local beaches and till deposits. The choice of raw materials was clearly guided as much by aesthetics as by practical concerns. Colour and visual distinctiveness were important; comparable work in other regions may allow us to establish the extent of these conventions. How far particular attitudes towards the appropriateness of certain kinds of rock were held in common may provide valuable insights on the balance of local, regional and broader traditions.

This study has also identified a number of challenges to current views on morphology and chronology. With the benefit of new dates, we can now question the idea of a developmental trajectory of simple maceheads followed by more elaborate forms. Variety was there from the outset. Our work suggests that apparently subtle differences in macehead morphology may yet be significant. There is a genuine variety in the *becoming* of maceheads, and in the ways they were treated over the

course of their lives; we gloss over that variety at our peril. The same applies to patterns of use and breakage. The treatment of individual maceheads does not accord with the exclusively 'ceremonial' function suggested by Smith (1911) and others in the 20th century. However, the care taken in manufacture suggests that these artefacts, like many others, often had a significance that went beyond utility. Nevertheless, Smith's chosen term 'mace-head' is worth retaining as it describes both a blunt tool or weapon and an object with potential as a symbol of authority. With Neolithic maceheads, these different qualities were brought into focus as a function of context and audience. Patterns of use damage indicate that even the finest tools were used to deliver heavy blows on some occasions. Whether this was against another person or an animal, and in what scenario, is not clear, but it is perhaps significant that we find Neolithic cattle skulls with the tell-tale signs of pole-axing.

The pattern of breakage in Orkney is also significant. Many maceheads were broken in use, but some were deliberately taken out of service. The precise reasons for this 'decommissioning' are difficult, as yet, to determine. Biographies of artefacts would have been entangled with those of people. There may have been many scenarios in which it was necessary to 'make a break', the smashing of a macehead bringing certain associations or expectations to a close. Whatever the case, once broken, macehead fragments were apparently free to serve other practical purposes.

Our study raises many questions. There is a marked concentration in distribution in and around the Brodgar monument complex on Mainland. How far this is a genuine pattern or a simple artefact of where we have tended to focus our attention remains to be seen. But with fieldwork ongoing across the archipelago, there is a great potential to explore how the making, using, breaking and deposition of maceheads was caught up in different settings; from small settlements to ceremonial centres and graves. There are wider issues too. The presence of potential imports suggests that objects and attitudes could travel over the horizon, though the nature of those journeys is still far from clear. Did the rock move, or was it only finished artefacts? And if some objects came in from distant sources, did other maceheads leave the archipelago? We suspect that this is likely, but the answers lie beyond the geographic limits of the present research. At a range of scales, there remains much to say about maceheads. But by building on the foundations laid by Fiona Roe, and by returning to the material, we are better placed to start asking the right questions. It is a great shame that Fiona is not around to discuss those questions with us.

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ABBREVIATIONS

BH – Barnhouse excavations
GLAHM – Hunterian Museum
GM – Glasgow Museums
OM – Orkney Museum
ORCA – Orkney Research Centre for Archaeology
NOB – Ness of Brodgar excavations
NMS – National Museums Scotland
SF – Small Find Number
SM – Stromness Museum

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