Fragmenting Society: Pottery Biographies from Neolithic Northumberland

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Introduction

This chapter is an attempt at the creation of an artefact biography for the pottery deposited in the Neolithic pits at the site of Thirlings, north Northumberland. The site contained a very large number of Neolithic pits, some of which yielded an impressive corpus of Neolithic Carinated and Impressed wares. The concern here is the analysis of the depositional process that led to the creation of complex pit deposits, but which began much earlier with the breakage and socially rule-bound storage of potsherds; a full excavation report and detailed analysis of the form of the pits in their regional context can be found elsewhere (Edwards 2012; Miket & Edwards 2008). The pottery from Thirlings appears to have been treated in a complex and socially rule-bound manner prior to its deposition, with fragmentation and provisional discard processes both playing a part in the post-depositional biography of the pottery corpus What follows is an attempt to build a narrative of the 'lives' of potsherds from breakage to burial, but in a manner that avoids a focus on an individual pot or pit, instead basing the interpretation on statistically valid trends in the data from the entire site.

The biographical approach

In order to navigate the complexity of the evidence from Thirlings, the principal method of interpretation is through the construction of 'biographies' for potsherds. The idea of a 'biographical' approach to interpretation came to the attention of archaeologists with the publication of Igor Kopytoff's 'The cultural biography of things: commoditization as process' (1986). He sought to show how the interpretation of the biography of an artefact should account for its existence as culturally constituted and how, through its 'birth', 'life' and 'death', it could be at the centre of shifting meanings and values. Objects need not be physically altered in order to change their social role and therefore their meaning. Changes in their contexts of use or performance also heavily influence the values ascribed to artefacts (Gosden and Marshall 1999: 174). The classic example is the competitive exchange of Kula necklaces in Melanesia, which can be of greater or lesser 'worth' depending on the genealogy of their previous owners (Strathern 1988). The biography written in this paper differs from those commonly interpreted by archaeologists. Usually biographical accounts focus upon individual artefacts or restricted groups of object that are treated in a similar manner. Be they

about the stones at Avebury (Gillings and Pollard 1999), decorated pots (Barclay 2002) or Greek Neolithic buildings (Nanoglou 2008), these interpretations are avowedly particularistic in the sense that they focus upon individual objects rather than a corpus of objects treated similarly. Here, however, the biographies of potsherds are based upon statistically significant trends recognised in a large dataset, deliberately avoiding a focus upon particular pots or pits, and instead statistically examining an entire class of material culture, the pottery, from Thirlings. The intention is to create an interpretation of how potsherds were treated following the breaking of a vessel and up to the point of their burial in a pit that is valid not just in one instance, but forms a generic biography for this artefact type at Thirlings. The approach is useful in tracing the changing significance of practices associated with producing, selecting and depositing pot sherds over the whole sequence of the occupation of a Neolithic site over hundreds of years. The resulting narrative is not a single, particular object biography, then, but a general curriculum vitae of Neolithic pot sherds comprised of patterns in the biography of hundreds of individual sherds.

Neolithic remains from Thirlings

Thirlings is located on a gravel terrace of the River Till in the Milfield Basin (figure 2), an area well known for its Neolithic henge complex and pit alignments (Edwards 2007; Edwards, Miket & Bishop 2011; Harding 1981; Miket 1981; Waddington 1999); Thirlings is around 500m from the nearest of these henges at Ewart. The Neolithic remains at Thirlings comprised nothing except pits. All were agriculturally truncated negative features, with no stratified contexts above the level of the subsoil. 228 pits were excavated between 1973 and 1981 by Roger Miket and Colm O'Brien, of which 39 held datable Neolithic material culture (either by radiocarbon determination or pottery typology). The pits varied widely in character: some were straightforward features with a single fill, many appeared to be postholes, yet there were a significant number that exhibited remarkable complexity and a unique approach to the combination of different elements of material culture. A full excavation report is available (Miket & Edwards 2008).

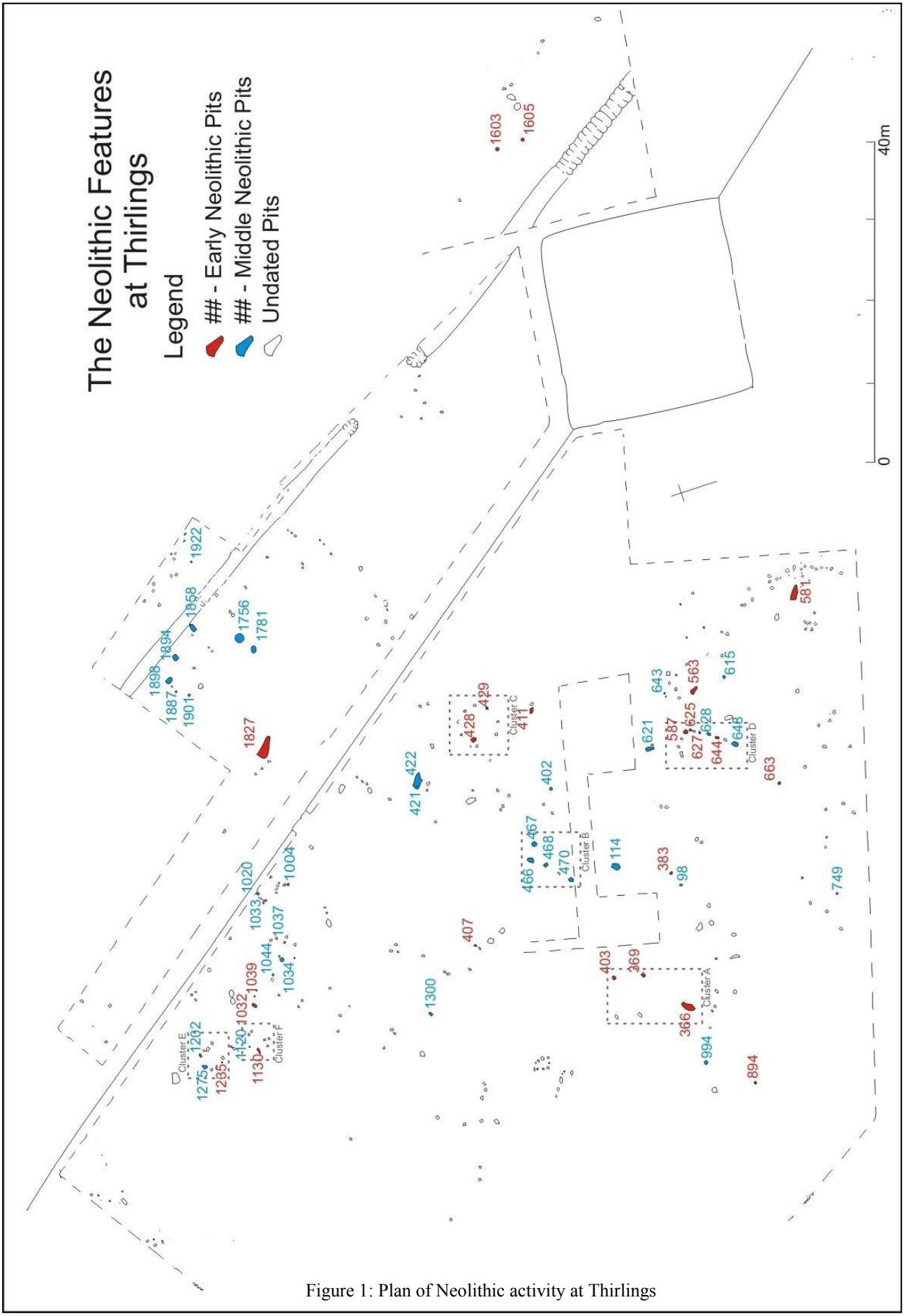


Figure 1: Plan of Neolithic activity at Thirlings

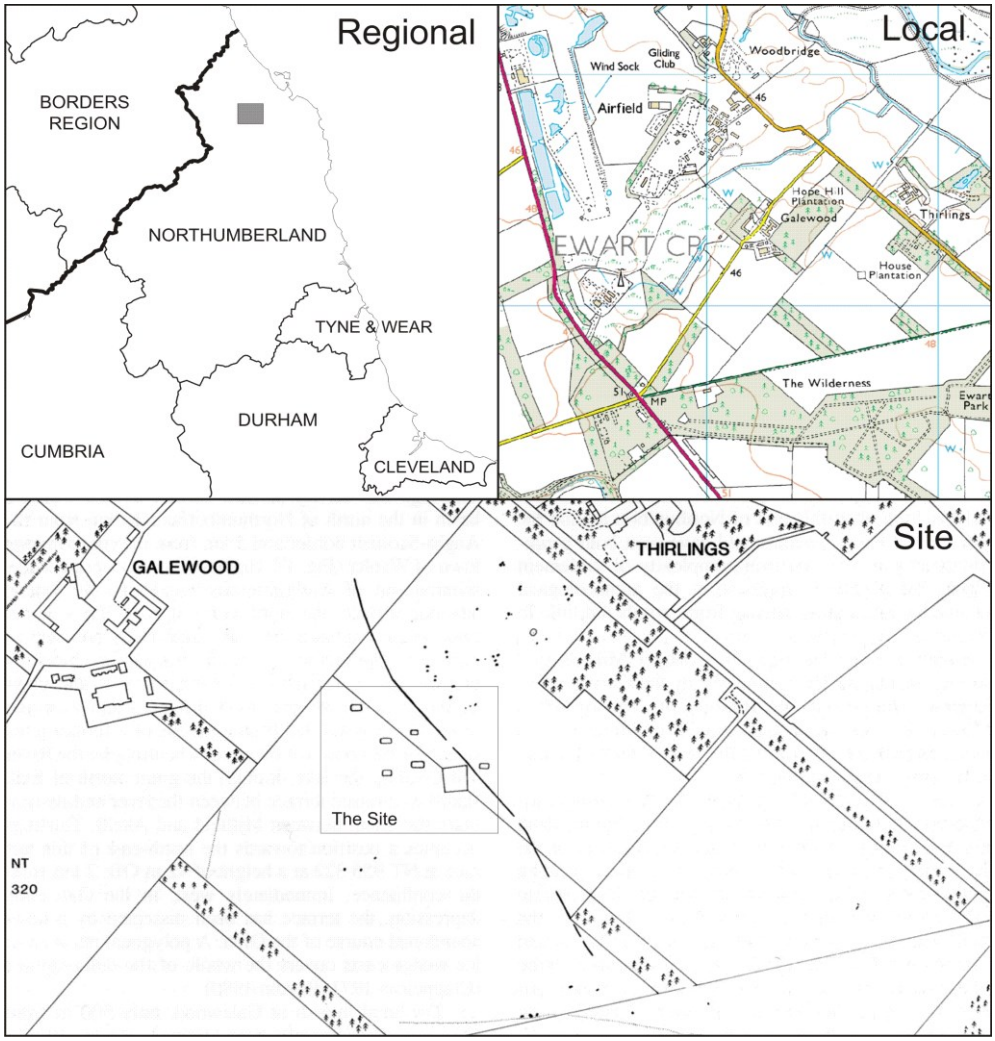


Figure 2: The location of Thirlings

In total 523 potsherds, originating from at least 80 separate vessels, were recovered from the 39 pits that provided Neolithic dating evidence. A small amount of flint was recovered from a few pits. In addition to the material culture, the majority of pits contained contexts rich in charcoal, other burnt material, and evidence of organic decomposition through highly loamy fills. It was these contexts that provided the range of Neolithic dates from the site (figure 3), which span the whole of the period. The first group of dates represent samples sent for radiocarbon determination to the Harwell laboratory between 1973 and 1981; the second group are the results of a more recent programme in 2006 by the Oxford Accelerator laboratory. Figure 3 is the OxCal plot of the determinations, grouped by pottery style into dates associated with Carinated Wares, Impressed Wares, and those with no association. HAR844 from pit F366 has been discarded as anomalous, and OxA16102 used in its place.

F366: 7030–5370 cal BC (HAR844) - anomalous

F369: 4340–3780 cal BC (HAR1118)
F430: 3640–2890 cal BC (HAR6659)
F466: 2920–2210 cal BC (HAR1451)
F467: 3279–2570 cal BC (HAR1450)
F470: 3500–2880 cal BC (HAR6658)

F366: 3340–2940 cal BC (OxA16102)
F587: 3910–3650 cal BC (OxA16101)
F643: 3340–2920 cal BC (OxA16164)
F644: 3780–3640 cal BC (OxA16104)
F648: 3360–3020 cal BC (OxA16103)
F1275: 3630–3360 cal BC (OxA16100)

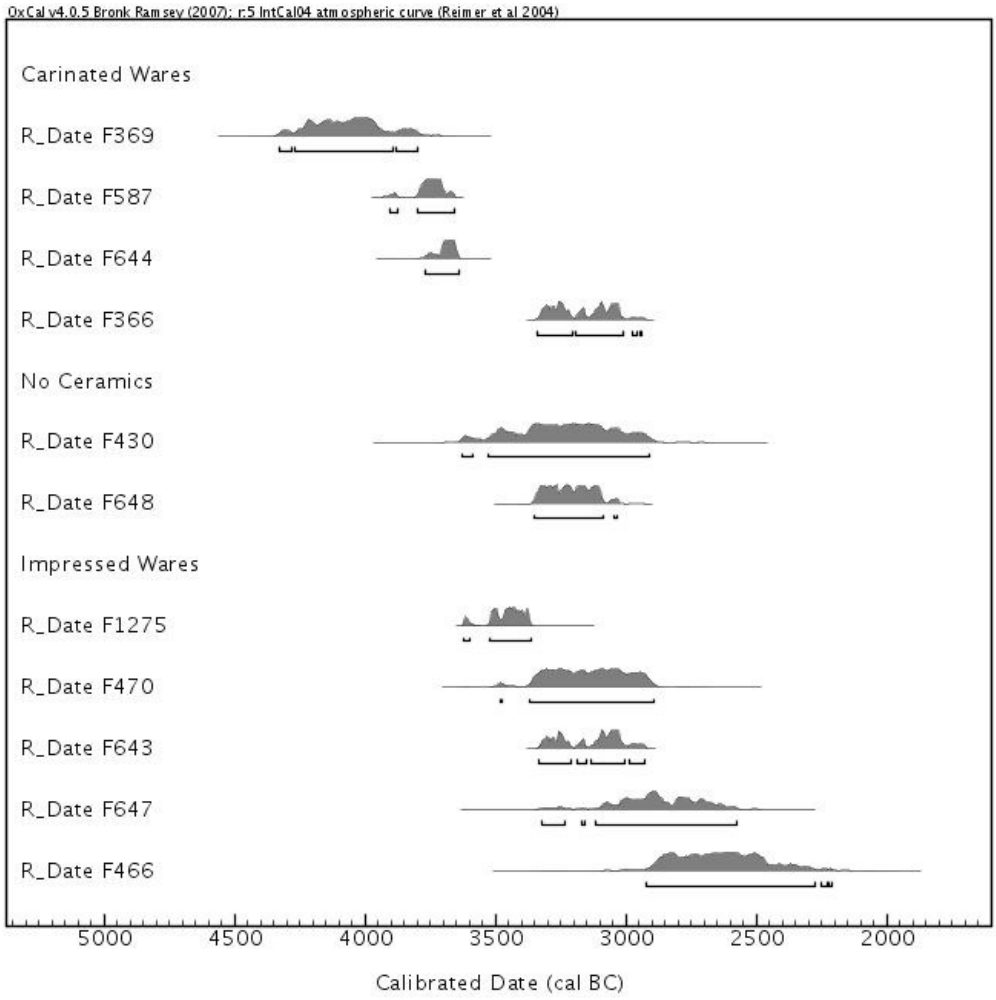


Figure 3: Calibrated C14 dates from Thirlings grouped by pottery type

On the basis of this dating evidence and the distinct types of pottery recovered, the occupation of the site was divided into two broad phases: Earlier Neolithic, associated with Carinated Ware deposition; and Middle Neolithic, associated with the deposition of

Impressed wares. Tables 1 and 2 record the total number of Earlier and Middle Neolithic sherds, and likely minimum number of vessels from which these derive. Importantly, the corpus provided a roughly comparable number of sherds from each type of vessel, which allowed reliable statistical analysis.

Total Sherds	
Earlier	270
Middle	253
Total	**523**

Total Vessels	
Earlier	37
Middle	43
Total	**80**

Tables 1 & 2: Total pottery numbers at Thirlings

Fragmentation analysis

In studying the archive from Thirlings it quickly became evident that the pits could be categorised into a number of mutually exclusive types. A full analysis of these is provided in an earlier paper (Edwards 2012), but they require a summary treatment. Pits without any evidence of a post being present were categorised as 'depositional'. Pits containing evidence of a post and, crucially, which appeared to have been dug and filled with the sole purpose of supporting that post, were labelled 'postholes'. Pits that contained evidence of one or more posts, but which held complex deposits and were much larger than necessary for the support of a post, were identified as 'post-marked depositional' features. This final category was particularly important. It was clear that these features could not be simply categorised as postholes: they were often excessively large (larger than a metre in diameter), but held small posts, and; they regularly contained a series of complex deposits and re-cuts, but with a small shallow post as the final phase in the sequence.

Testing these categories revealed that they received quantifiably different amounts and types of deposit. Post-holes always contained less pottery than the other two types, and we will not discuss these further, however, post-marked and unmarked deposits provided striking evidence of the deliberate selection of certain sizes of potsherd for disposal. In the earlier and middle Neolithic post-marked pits contained, on average, more pottery than their unmarked counterparts. Yet in the middle Neolithic, despite the greater weight of pottery in post-marked pits, this was composed of a greater number of smaller, lighter sherds. Unmarked pits still contained less pottery, but the sherds themselves were almost exactly *twice* as large and

heavy as those in the post-marked deposits (Edwards 2012, 86-7). The evidence for the fragmentation of pottery is summarised in table 3.

Pit Type	Total Pottery Weight	Individual Sherd Weight	Individual Sherd Size
Earlier Neolithic			
Deposit (no post)	Lesser	Lesser	Smaller
Deposit (post-marked)	Greater	Greater	Larger
Middle Neolithic			
Deposit (no post)	Lesser	Greater	Larger
Deposit (post-marked)	Greater	Lesser	Smaller

Table 3: Trends in pottery deposition and fragmentation by pit type

It seems that, overall, different types of pit received quantitatively different types of deposits. Post-marked pits were not only as structurally different in form from unmarked pits, but also quantitatively different in terms of the deposition that occurred within them. Therefore, at Thirlings, it is clear that potsherds were selected for deposition based upon their *degree of fragmentation* and the type of pit that was being created: in the Middle Neolithic different degrees of pottery fragmentation were related to the physical marking of a pit with a vertical post or series of posts. Thus, as the physical complexity of a pit increased so did the amount of deposition that occurred within it, insofar as a proliferation of post-marking can be interpreted as a more complex form of pit deposit.

Abrasion analysis

An analysis of the fragmentation of potsherds in the pits at Thirlings provides an end-point to their biography as deposited sherds, but it does not provide any substantive evidence on the lives they led between breakage and burial. In order to examine this part of their narrative, abrasion analysis was undertaken in order to understand the processes that acted on the potsherds before they were buried. This was crucial in determining whether the size/weight differences observed between the pit-types could be attributed to mere taphonomic factors, or to deliberate human *choice.*

The principle behind studies of abrasion is that the present condition of a pottery sherd provides indications as to the processes that created that condition (Schiffer and Skibo 1989: 101). The analysis of abrasion is concerned with the quantification of the degree of erosion that has judged to act upon a pottery artefact prior to excavation. The analysis does not

presuppose that this abrasion occurred pre- or post-deposition, though it is usually the case that abrasion largely ceases upon burial (*ibid*., 90). At its most basic, abrasion usually dictates that sherds with a long history of post-breakage disturbance, such as trampling, will get smaller through time, and the number of sherds will increase (Bradley and Fulford 1980, 86). The fragmentation of ceramics usually stops when the size reached provides enough stability to resist further breakage (Schiffer 1987, 129).

The method in this study largely followed, with a few variations, that described by Sørensen (1996) in her consideration of the middened pottery deposits at the Bronze Age site of Runnymede Bridge. The aim in Sørensen's study was to examine abrasion as an indicator of archaeological deposit formation, *not* as an indicator of artefact-based activity prior to deposition. In this sense it differs from the concerns here, where we can be relatively certain that deposition was a discrete activity and abrasion was therefore a direct consequence of exclusively pre or post-depositional activity. As a result Sørensen's levels of abrasion were relatively simplistic (1996: 67), and organised on three levels 'low', 'medium' and 'high', which covered abrasion to both the edges and the surfaces together. For the analysis of the Thirlings material Sørensen's scheme has been slightly elaborated, into four levels for edge abrasion. They are as follows:

1. None or very little abrasion – very fresh breaks, unpatinated core colour, sharp edges, very rough texture, and extruding grains of temper.
2. Low abrasion – edges maintain sharpness but markedly extruding edges and temper are worn, core colour generally still fresh but texture is slightly smoother.
3. Medium abrasion – points and edges are now worn blunt, temper no longer extrudes, texture of core noticeably smooth, core colour is dull or patinated.
4. High abrasion – sherd is heavily rolled: surfaces have receded from core and core worn smooth, presenting a rounded effect, core is heavily stained and altered.

A full report on the abrasion analysis can be found elsewhere (Edwards 2012: 88-9, 2009), but there were several important trends identified. Initial testing observed that no particular abrasion level characterised the sherds as a total population; abrasion levels were randomly distributed, taking the pottery corpus as a whole. In other words, sherds were either exposed to wildly different abrading processes or, more likely (see below for an appreciation of the range of potential processes that could have acted upon the sherds), they experienced the

same processes for different amounts of time or intensity. Secondly, it was demonstrated that these levels of abrasion **could not** have been the result of trampling or other forms of direct erosive activity, as sherd size was not statistically related to abrasion levels, using Kendall's Tau as the test for a relationship between the two variables (see Edwards 2012 for relevant statistical tests). Following Bradley & Fulford 1980: 86) it would be expected that sherds would become smaller as they became more abraded, yet as this was not the case at Thirlings, some other form of abrading process must have been responsible (see below), which abraded the sherds but did not cause them to fragment. A corollary of this point is that the size of the sherds probably reflects the level of fragmentation they attained on initial breakage, remembering that a) abrasion levels were statistically random across the corpus, and b) unrelated to fragmentation levels. It was also evident that sherds from the same pot experienced similar levels of abrasion. So whatever the abrading process, it was consistently experienced: in 96% of cases (taking pots represented by a minimum of four sherds as the sample) the co-efficient of variation (*V*) demonstrated that there was low variation in abrasion values between sherds from the same pot. Similar values were returned for the variance of sherds from the same pit (Edwards 2012). So, whilst overall abrasion levels were random, when analysing sherds from the same pot, it was not. We can summarise these points as follows:

a. No particular level of abrasion characterised Thirlings, statistically the abrasion levels conform to a random distribution.
b. Fragmenting and abrading processes are disconnected on the site, contrary to what is normally to be expected.
c. Sherds from the same pot and the same pit are similarly abraded.

It has already been demonstrated that the deposition of differentially fragmented potsherds was definitely of concern, especially between post-marked and unmarked pits in the Middle Neolithic. The abrasion data introduces a further factor: fragmentation was not the direct result of abrading processes caused by exposure of sherds on the ground surface through trampling. So, if the level of fragmentation of sherds in pits was not the result of pre-depositional random abrasive action or taphonomic factors, the only remaining alternative is that it was the result of *deliberate choice* to include sherds of a given size in different types of pit. This could take two forms. Sherds could have been fragmented down to the desired size on breakage, or at a later point sherds could have been selected for deposition based upon

size. Yet, whilst fragmentation levels were deliberate, it is clear that *abrasion levels were not*, as they are statistically random.

However, because there is also a range of abrasion values present and not every sherd was freshly broken, potsherds must have a) suffered some form of abrading process that *did not lead to further fragmentation*, and b) suffered this abrading process for differing lengths of time or at different intensities. It seems that sherds from the same pot were treated similarly, as there is low variance in their abrasion values. If we combine this observation with the fact that there is only one example of inter-pit sherd refitting, and that sherds from the same pit are similarly abraded, then it seems that sherds ending up together in the same pit were probably *stored together* prior to deposition. However, as there are differences in abrasion between different pits, either the length of this storage period varied, or the intensity of the abrading process changed.

The Pottery Biography – the origins of the material culture

Having provided a summary of the main points of evidence from Thirlings relating to treatment of material culture, it is clear that broken pottery was involved in a series of potentially complex series of processes before it was buried. Sherds appear to have been stored together for different amounts of time, in a context where they were protected from direct percussive erosion, but could still be slowly abraded without becoming further fragmented. Sherds of a particular size were selected from this stored resource for complex deposition in a certain type of pit: smaller sherds in post-marked pits, and fewer larger ones in unmarked pits.

What follows is an attempt to construct a biography of the material culture in the pits using the insights gained in the statistical analysis summarised above. However, the biography of broken potsherds must be reliant, at least in part, on the contexts of origin of the objects and substances involved. First, the organic remains, including evidence from charcoal will be discussed, then the pottery, before finishing with a consideration of the nature of occupation on the site.

The uses of pits - organic matrixes

The pottery from Thirlings was excavated from within a matrix of charcoal-flecked, loamy soil that almost certainly represents the presence of decayed organic matter. This is not unusual in pits of the period, where previous excavations have generally characterised this as domestic, settlement or occupation refuse, placed in the ground for a variety of possible reasons. The origin of such material has generally been a non-question: it was straightforward for those interpreters who saw pits from the largely functional, storage point-of-view, such as Hurst Fen (Field *et al.* 1964); the Grooved Ware pits of Yorkshire (Manby 1974); pits in the Chilterns (Matthews 1976); and those at Spong Hill (Healy 1988). As the pits were excavated and used for domestic purposes (such as the storage of food) prior to their filling, it followed that the refuse-rich fill was of domestic origin also. Interpretations of pits as places for refuse deposition also saw the material as domestic in origin: as at Biggar Common (Johnston 1997), Beckton Farm (Pollard 1997), Rowden (Woodward 1991, 43), and Cassington (Case 1982). Even those accounts that stressed the symbolic or ritual *act* of pit deposition also posited a domestic *source* for the material. Deposition in tree throws was attributed to a desire to completely clear settlement traces from the landscape (Evans *et al.* 1999, 247-249); Pollard saw the symbolic deposition of settlement refuse as marking the end of a site's use (Pollard 1999); and finally, the bizarre juxtapositions of artefacts in pits near the Dorset Cursus at Firtree Field were contrasted with simpler examples further from the monument, which were described as 'domestic' in character (Barrett *et al.* 1991, 84). Similarly, at Kilverstone, Norfolk, despite a complex pre-depositional biography for the pottery and flint recovered from the pits, this was interpreted as entirely compatible with their interpretation as refuse from settlement or occupation activity, the most important element being the act of burying (Garrow *et* al 2005, 151). All these interpretations share a readiness to attribute a quotidian origin to the material culture, regardless of the manner in which they categorise the type of deposition it was involved in. This paper would discard a 'domestic' label, but nevertheless, it is clear that the material culture deposited in pits, especially organic remains, can be considered the refuse of everyday activities.

What little is known of the composition of the organic matrixes from Thirlings certainly does not contradict an everyday source for the material. Small-scale environmental sampling of four pits (F1858, F1894, F1898, and F1901) identified a large amount of hazelnut fragments associated with Carinated Ware, Impressed Ware, and Grooved Ware (Miket and Edwards 2008). The carbonised wood utilised in radiocarbon dating was commonly from Oak, Hazel, or Hawthorn, though notably in pit F1450 there was a mixture of woods from Apple, Rowan,

Hawthorn and one of the genus *Prunus*, probably plum. There was no particular dominance of any species, and the environmental sampling was too sparse to even tentatively attempt statistical analysis. Unfortunately, due to the lack of organic preservation on the Milfield gravels, there is no data on the type of wood used for the upstanding posts.

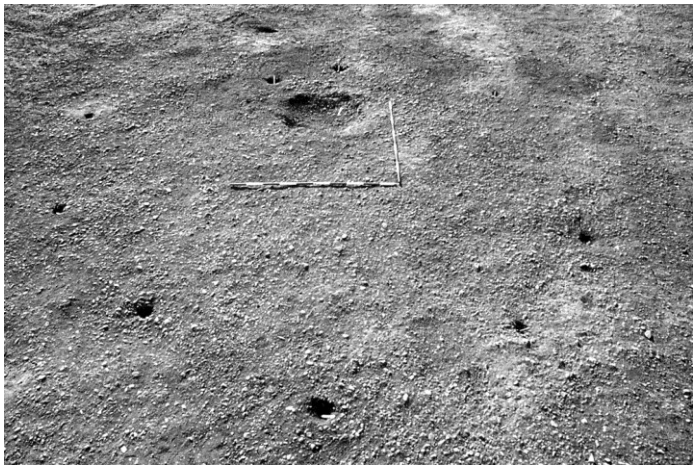
Human life during the Neolithic must have generated organic waste. This straightforward explanation is not a slide back into a functionalist interpretation of pit deposition: material can have mundane origins yet still be active in social life, and still be deposited in a highly esoteric manner. In addition, the generation of organic waste should not be conceptually separated from its eventual disposal, as the social categorisation of the material during its pre-depositional history is directly relevant to the nature of its burial. Yet this complex social classification obviously does not *exclude* a 'mundane', everyday origin for the material.

The uses of pottery

Given that they were a multi-purpose technology throughout their respective periods of prominence, it is practically impossible to define a given set of associations for any of the three major styles of Neolithic pottery: Carinated, Impressed and Grooved wares. It would be wrong, therefore, to interpret Thirlings based upon only one of the many associations of the various styles, say, as for the symbolic deposition of Grooved Ware. Moreover, following recent developments in the study of the chemical evidence supporting pot use in food preparation (Mukherjee *et al.* 2007; Copley *et al.* 2005a; Copley *et al.* 2005b; Dudd *et al.* 1999), it seems that, in keeping with evidence from a variety of contexts across Britain, the pottery at Thirlings is likely to have been used for the production and processing of foodstuffs. It is unlikely that the pottery was produced 'for' deposition. Rather, complex deposition was the appropriate manner of disposal, or indeed reuse, for a class of material culture that had come to the end of its life in one sphere of activity, and was ready to enter another.

Occupation and Settlement

'Occupation' is the act of occupying a given locale and undertaking non-predetermined tasks. The result of an



occupation, archaeologically speaking, is an occupation deposit, which could be a socially complex refuse deposit, but does not have to be. 'Settlement' is one form of occupation, and describes the variety of tasks and undertakings that characterise the everyday living and functioning of human groups, not necessarily the presence of particular structures or buildings. Pit deposits can therefore be interpreted as the deposition of settlement-generated occupation refuse, but without necessarily reflecting the actual locale of that occupation – just the complex and socially rule-bound location of its disposal. The evidence from Thirlings fits this definition. Following the definition of 'settlement' as the 'act of living in a place', it is entirely correct to term the organic residues and the pottery found within the pits as 'occupation deposits', especially given their likely association with subsistence practices. It would be wrong to try to qualify precisely the specific nature of this occupation because there have been no *in-situ*, non-pit deposits excavated.

It is possible that simple settlement did occur on the site. The single potential circular structure (figure 4) has parallels in similar structures found at Beckton Farm, Dumfries and Galloway, although associated with Grooved Ware (Pollard 1997); and Cowie, Stirling, which produced evidence for a multi-period accumulation of circular post arrangements (Barclay 2003). Yet this single possible structure seems rather out-numbered by the remaining pits and the total lack of any further evidence for recognisable 'buildings'. Perhaps semi-permanent tent structures based around a single supporting pole existed on the site, as this would explain the number of individual postholes. Under this system, any ancillary ropes or posts would have been secured lightly into the topsoil and now would no longer be present. Yet the alternatives are numerous and no less convincing: Thirlings could have been periodically visited from somewhere in the local area with the specific aim of creating a complex pit deposit; the site could have been temporarily occupied and a pit created each time; decades could have passed between depositional events. Indeed, all these situations may have occurred at different periods in the Neolithic, or between the seasons of the same year; quite simply, we will never know.

To summarise, it seems likely that the pits at Thirlings do not differ from the pattern established for British Neolithic pit deposits in general. The pits probably represent the complex and rule-bound deposition of occupation deposits. The potential for all the material culture to have been utilised in subsistence activities leads to us to define the origin of these deposits in settlement practices. The origin of the material culture is important, but only

insofar as it provides a starting point for a narrative consideration of the process that brought its particular juxtaposition into being. Stating that the pits contain settlement refuse merely defines –them as the culmination of a sequence of activities. An understanding of social change, of the variety of human practice, and the significances around which this was structured is *only* possible through a consideration of the complex chain of events and contingencies that created these deposits.

The Pottery Biography – discard and deposition of potsherds

There are a number of possible paths down which potsherds could have travelled between fragmentation and deposition, as presented in figure 5. The diagram is divided into three major sections: fragmentation, provisional discard, and selection. These represent the three archaeologically visible instances at which specific choices were made, during the Neolithic, as to the appropriate treatment of the pottery. 'Fragmentation' concerns the choices made at the point the pottery was initially broken, and its immediately subsequent treatment. The potential for deliberate fragmentation is clearly evident here, following the work of John Chapman (2000), and the possibility of identifying this practice is the primary concern at this point. 'Provisional discard' represents the second point at which choices must have been made in the Neolithic. Schiffer's 'provisional discard' (Schiffer 1987, 99; Needham and Spence 1997, 77) was chosen as the most value-neutral means of labelling this behaviour. This was especially important considering that the more specific terms 'curation' and 'middening' form options *within* the category of provisional discard and will be considered—and rejected—below. 'Selection' processes represent choices available for the retrieval of provisionally discarded material and its ordering prior to deposition.

Figure 5 highlights the two most likely 'routes' for potsherds (A & B), but the diagram also contains a large number of alternative choices. These were all possibilities based upon potential practices that have been observed or inferred elsewhere. However, the archaeological evidence dictates that these other pathways were not taken. They are included to demonstrate the large number of possibilities open to Neolithic depositors, and also to strengthen the case for those that are interpreted as more likely. Nevertheless, it was impossible to identify a single narrative thread that could explain the variation in the patterns of abrasion, fragmentation and deposition. This was because the initial act of fragmentation cannot be archaeologically identified – whether it was accidental or deliberate, and whether,

as a result, sherds were further fragmented or left at their original (broken) size. This interpretative dilemma has ramifications for selection processes, so both are considered in their entirety. What follows is a description of each potential practice displayed on the diagram, with a brief note explaining why it has been considered likely, or rejected as evidentially unsound.

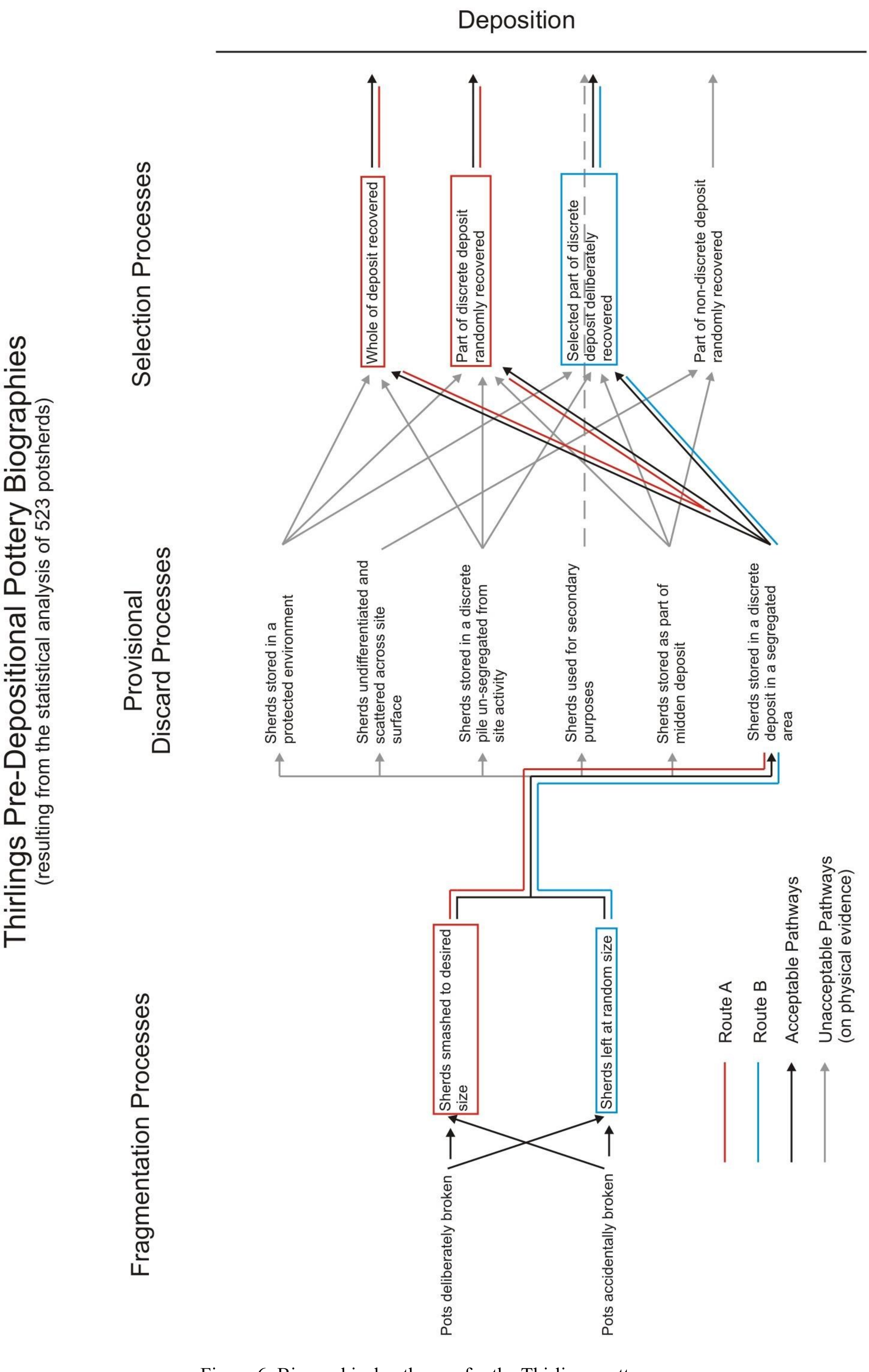


Figure 6: Biographical pathways for the Thirlings pottery

Fragmentation processes

Deliberate versus accidental pottery breakage

All pathways begin with the breakage of a pot, but as we know that the sherds were deposited in a complex manner at the end of the sequence, it is reasonable to question whether they were deliberately broken with later deposition in mind. No certain judgement can be made, but it does seem unlikely that the pottery was deliberately broken; it has been discussed at length that pots were most likely used in subsistence activities for food preparation, and whilst this does not rule out deliberate breakage, it does deny the possibility that the pots were produced specifically *for* later destruction and deposition.

Deliberate further fragmentation, post-breakage

However, denying deliberate initial breakage does not rule against the possibility that potsherds could be further fragmented, post-breakage, down to a desired size; the diagram leaves this possibility open. Which possibility is accepted here has ramifications in the subsequent biography of the sherds, and on the degree of human intentionality in the process, but this is better discussed later. 'Route A' charts the course of sherds if this possibility is accepted.

Sherds left at random size, post-breakage

The alternative to any deliberate fragmentation is that the sherds were left at the sizes the breakage event produced, and then stored. Accepting this proposition, 'Route B' follows the course of the sherds.

Provisional discard processes

Sherds stored in a protected environment

This is unlikely because a degree of abrasion exists on the majority of the sherds; if they were stored carefully and protected they should all be fresh and relatively unabraded, but this is demonstrably not the case.

Sherds undifferentiated and scattered across site surface

This is rendered unlikely because it has been statistically demonstrated that sherd size is disconnected from abrasion. If sherds were left loose on the site, trampling would both abrade the sherds and fragment them further, and the variables would be co-dependent.

Sherds stored in discrete pile un-segregated from site activity

This scenario envisages that the sherds were kept together but in a position open to trampling and other transformational processes. It is rejected for the same reason as above, that abrasion would be accompanied by further fragmentation; statistically this is not the case.

Sherds used for secondary purposes

In this case, the sherds would be put to some further use following their fragmentation, which could include any number of possibilities from improvisational 'plates' to draft-exclusion. However, it has been demonstrated that most of the sherds from the same pot were abraded to a similar degree, so if this scenario is to be accepted all the sherds must have been treated in the same way, and one must posit the existence of an arbitrary moment in time when the sherds were collected back together and deposited. It is not utterly unseemly, but Occam's Razor surely dictates that another scenario should be given precedence.

Sherds stored as part of midden deposit

There were no middens identified on the site, and whilst it is recognised that the pottery could have been transported from elsewhere, there is no evidence for this (though see Edwards & Miket, forthcoming). If sherds were thrown on growing midden, each new dump burying previous ones, in this scenario it would be reasonable to expect the sherds to be less abraded overall, and also to show less variation between the pits/pots than the statistics reveal. The lack of refits between different pits also excludes this scenario, as one would expect a certain mixing of the deposits in a midden situation through bioturbation, whereas Thirlings shows evidence of the careful assignment of particular pots to certain pits.

Sherds stored in a discrete deposit in a segregated area

This would seem to be the *only* possibility that could account for the degree of sherd abrasion whilst still allowing for a disconnection between abrasion and fragmentation. In this scenario the sherds are stored in a pile in a position segregated from trampling or other sources of direct percussive abrasion, whilst remaining open to elemental abrasion by wind, rain and steady decay. This also has the benefit of the supporting ethnography from Tzeltal Maya communities, where potsherds were provisionally discarded in relatively inaccessible places for later disposal or reuse (Deal 1985, 253). In none of these cases were the provisional discard areas described as middens, nor were the sherds treated in a manner that justifies the term 'curation'.

Selection Processes

Whole of deposit recovered and part of discrete deposit randomly recovered (Route A)

These two possibilities only operate if it is argued that potsherds were fragmented to a desired size before the provisional discard stage. This is important, as it recognises the difference between post-marked and unmarked deposits, especially in the Middle Neolithic, where a greater average weight of more thoroughly fragmented sherds was deposited in post-marked pits, compared to unmarked examples in which a smaller amount of larger sherds were found. So, as sherds were evidently being selected on the basis of size, some form of selection must have occurred; in this scenario, as sherd size was determined before storage, the whole of a stored deposit could be recovered, or a random proportion of it, with the same effect of recovering sherds of the desired size. The second of these two possibilities may be slightly more likely, as in no case have sherds representing an entire pot been recovered at Thirlings.

Selected part of discrete deposit deliberately recovered (Route B)

This final possibility could only operate if the sherds were left at a random size after the breakage event. In this case selection occurs at the very end of the process; sherds of random size were stored and those of appropriate size were selected for deposition within a given deposit. This recognises the real sherd-size differences between post-marked and unmarked deposits.

A question of intentionality: Route A versus Route B

Relying on their internal logic and the available evidence, there is no means of definitely deciding which of the two routes for pottery fragmentation, provisional discard, and selection is the more likely (see figure 7 for summary). The difference is important however, as it represents a difference in intention, and therefore a difference in the operation of human agency. Arguably, in Route A the point of intentionality lies at the beginning of the sequence: the deliberate breakage of pots, or the re-fragmentation of accidentally broken pots, marks a clear intention to later use sherds of a specific size in specific way. This immediately summons notions of predestination and of deliberate planning; this does not necessarily imply that there was a known pit-design in mind for each broken pot, rather that there was foreknowledge that broken pots of a restricted size would be required for a post-marked pit deposit at some point in the future. Yet this does not sit comfortably alongside the relatively lengthy time-interval that abrasion by elemental weathering would have required, unless one is also prepared to argue that depositional practice was so stable and necessary that it generated a forward-looking pottery storage strategy that managed sherds as a 'resource'. This is not a scenario that combines easily with the clear lack of consistency in pit design and, to a lesser extent, the lack of spatial patterning, which indicates a depositional strategy that was more *ad hoc* than deliberately planned.

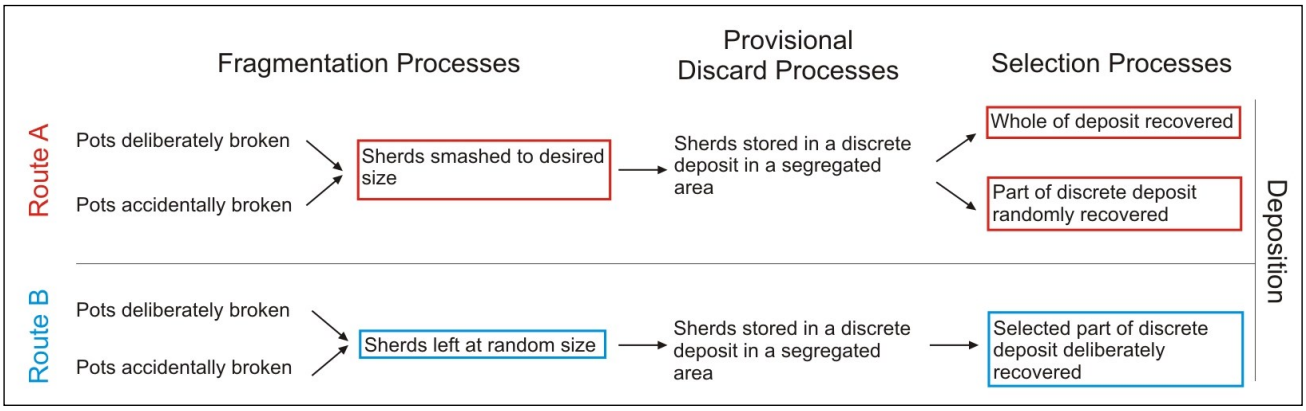


Figure 7: The two l routes of sherd biography

Alternatively, if the point of intentionality is taken to exist at the selection stage of the sequence, as in Route B, there are fewer implausibles. In this scheme potsherds are still deliberately stored, as they are acknowledged to be of significance for future deposition; however, the nature of this deposition is not so predetermined and it is far more opportunistic.

When the requirement arose to dig and fill a pit, the appropriate repertoire of artefacts was selected from what was available, including potsherds of the appropriate size. This is reflected in the structurally unique design of the pits, and implies that, whilst there was an outline or broad template of appropriate depositional strategy, this was not so prescriptive as to require forward-planning. This scheme accommodates the temporal dimension of abrasion through elemental weathering, which, if one accepts a mobile lifestyle, could have occurred when people were not present at the/a site. A more definite statement cannot be made, and the various scenarios explored here remain as a testament to the variability and potentiality of possible past behaviour; however, if a choice must be made, it seems that Route B represents a more likely scenario.

Post erection

One of the statistical observations that plays a major role in constructing this biography was the connection between sherd size and post erection in the Middle Neolithic. Post-marking became of greater significance during the Neolithic at Thirlings: in the earlier period, the small number of post-marked deposits contained a greater weight of pottery than unmarked examples, whilst in the Middle Neolithic the number of post-marked deposits increased and the pottery they contained was more highly fragmented than in their unmarked counterparts. Both of these situations demonstrate deliberate selection, and provide the strongest example of a 'rule' of pit deposition. However, we cannot state which of the two variables *drove* the process, if either. There are two possibilities: 1) the erection of a post could have been the desired end-product that required pottery deposition for some reason; or 2) post-marking and fragmented pottery both simply represent different elements of pit deposition alongside organic material, the size of the pit, and its eventual shape: items in a repertoire that could be drawn upon to create the unique finished deposit. We cannot know which, and it is probably not important, given that we are simply left with the knowledge that it happened. Clearly, on those occasions where highly fragmented potsherds were selected this occurred with the knowledge that post-marking would occur. The statistical relationship proves this; however, we should still view this articulated relationship as a small part of a greater, more opportunistic process that led to pits being dug for specific reasons and in a highly contingent manner.

Depositional pits without pottery

Finally, there were those pits that did not yield pottery but which did produce Neolithic material, such as F648 that was dated to 3360–3020 cal BC (OxA16103) from carbonised hazelnut shell. Accepting that the organic material in these pits was of the same origin as that from the pottery-bearing pits, we are drawn to the conclusion that pottery was not a requirement in all deposition. This denies ceramics the privileged position of driving the depositional process, and allows for deposition to occur as a social act without the involvement of pottery storage strategies. Organic material itself could have been stored prior to deposition, though we have no proof of this. Naturally, the analysis here has focused on the fragmentation and provisional discard of pottery because it demonstrably was related to the nature of pit deposition, but we should not be so assured of it primacy.

Conclusion:relative significances and contingent choices

No distinction was made between Earlier and Middle Neolithic deposition events, as the statistics demonstrated the different scenarios were equally applicable to either period. Accepting Route B as the most likely biography for the majority of pot sherds studied, pot sherds collectively formed a cached resource which was used selectively and reflexively in the repertoire of pit deposition activities . The inherent properties of the pottery or other material culture seem to have been most important factors in the mode of storage, selection and burial. Whereas under Route A the significant activities are the production of a size-specific cached resource which is later used in the production of a pit that adheres to a given design and contains , under Route B the significance lies in the production of a unique deposit at every stage. Route A privileges product, Route B, *process*.

Even though this analysis has eventually settled on one biographical route, the difficult nature of the interpretation highlights both the degree to which those acts must have been multifaceted, and the potential for individual contingency to effect the selection and treatment of pottery. It is worth remembering that this complexity arose and developed before *any deposition even took place*; every single act, every choice, every piece of material culture was wrapped in a thousand possible symbolic and/or functional meanings that led to their fragmentation, provisional discard and selection.

The most striking feature of deposition at Thirlings is its complexity. As a result, it would be easy to see the creation of pits as a planned and deliberate process from the outset, with a

series of 'ideal' pit templates in the minds of the people involved, who were storing pottery with a clear idea of the pit they eventually wanted to create. Yet to think like this would be to ignore one very important complicating factor: that of the timescales involved. First, the length of time that pottery was stored prior to its deposition—enough to seriously weather some of the sherds—and second, the amount of time over which the site was used and developed. The temporal scale also forces us to confront another fact. We are unable to examine the symbolism of the deposition in the pits or say *why* they were created: there is too much variability, both between the individual features and across the periods involved. Instead, we can interpret the pit deposits using the idea of *relative significance:* i.e. what appears to have been the most important factor in the way people produced a pit deposit.. For example, we know at Thirlings that the size of potsherds was of extreme importance in relation to the post-marking of deposits, yet relatively speaking, the state of decay of these sherds was insignificant, as there was a random distribution of abrasion values. Saying that something was 'significant' or otherwise, based upon a series of statistical trends is very different from saying why these trends existed or what they meant.

Arguably then, there are a limited number of aspects to the Thirlings pits that could be pre-eminent in terms of relative significance: the material that comprises the deposit (what); the process of creating the deposit (how); the finished pit (product); and how that pit relates to other pits (where). We can interpret what may have been most significant at the *specific instance* in which a given pit was dug. Most pits had no post, so clearly their finished appearance was relatively unimportant; and as it was heterogeneous there was no desired form. It was clearly significant to locate a pit on the site, but its specific relationship with other pits was relatively insignificant, evinced by a lack of patterns, except in a small number of cases. Finally, the pottery itself cannot have been of primary significance because it was not deposited in the majority of pits on the site. No category can have been of transcendental importance. At most of the visible, frozen instances of the past at Thirlings, significance was primarily vested in the *act* of juxtaposing a repertoire of material culture in a unique way. Ultimately, these acts privileged process over product, and the importance of contingent human choice in producing 228 unique examples of deposition.

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