CHAPTER 7

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Roman period waste deposits at Ørland, Norway

ABSTRACT
In this article, six large waste deposits and six smaller waste pits from Roman Iron Age Vik are analysed, the temporal and spatial relations between the waste deposits and the contemporary farms are discussed, and the activities related to the waste deposits are considered. Based on these findings, I suggest that local production of pottery occurred in the northern area at Vik (Field A) during the Early Roman period, together with some metalworking. In the later period, pottery was imported to Vik. Slaughter of animals took place outside the known settlement, while cooking and consumption took place within the settlement – sometimes in the form of feasts. Spatial analysis reveals that the location of the waste changed from the Early to the Late Roman period, gradually moving away from the central yard. Although waste from pottery manufacture and metal-working indicates a slight degree of division of labour between the farms in Fields A and C in the Early Roman period, the remaining waste points to socially equated farms with a fisher-farmer economy throughout the entire Roman period.

INTRODUCTION
During the excavations at Ørland Main Air Base in 2015 and 2016 (Figure 1), eleven Roman period (AD 0-400) and one Migration period (AD 400-575) waste contexts were examined (Figure 2). Four of these contexts (106581, 110297, 210240, 500200) were especially complex in that they contained traces of activities not only connected to waste deposition in the form of discarded household waste, but also activities such as cooking, production and/or manure management.

Large waste deposits, rich both in finds and osteological material, are rare within Roman Iron Age settlements in Norway. A comprehensive review of Roman settlements in Norway falls outside the scope of this article, but a superficial look into some of the published work on Roman settlements shows that few contained waste layers similar to those at Vik (e.g. Børsheim 2001, Diinhoff 2010, Gjerpe & Østmo 2008, Grønnesby 1999, Meling 2016), although waste pits were not unusual. There are some instances of waste layer formations, though different from the ones at Vik: at Rødbøl in Larvik, Vestfold, two Roman period waste layers were found, though related solely to smithing (Gjerpe & Rødsrud 2008). However, in Rogaland there are a few examples of Roman period waste layers that bear resemblance to those at Vik: at Einargården in Sola, a rare waste layer measuring 3 m x 11 m was found, directly outside a three-aisled building. This layer contained pottery

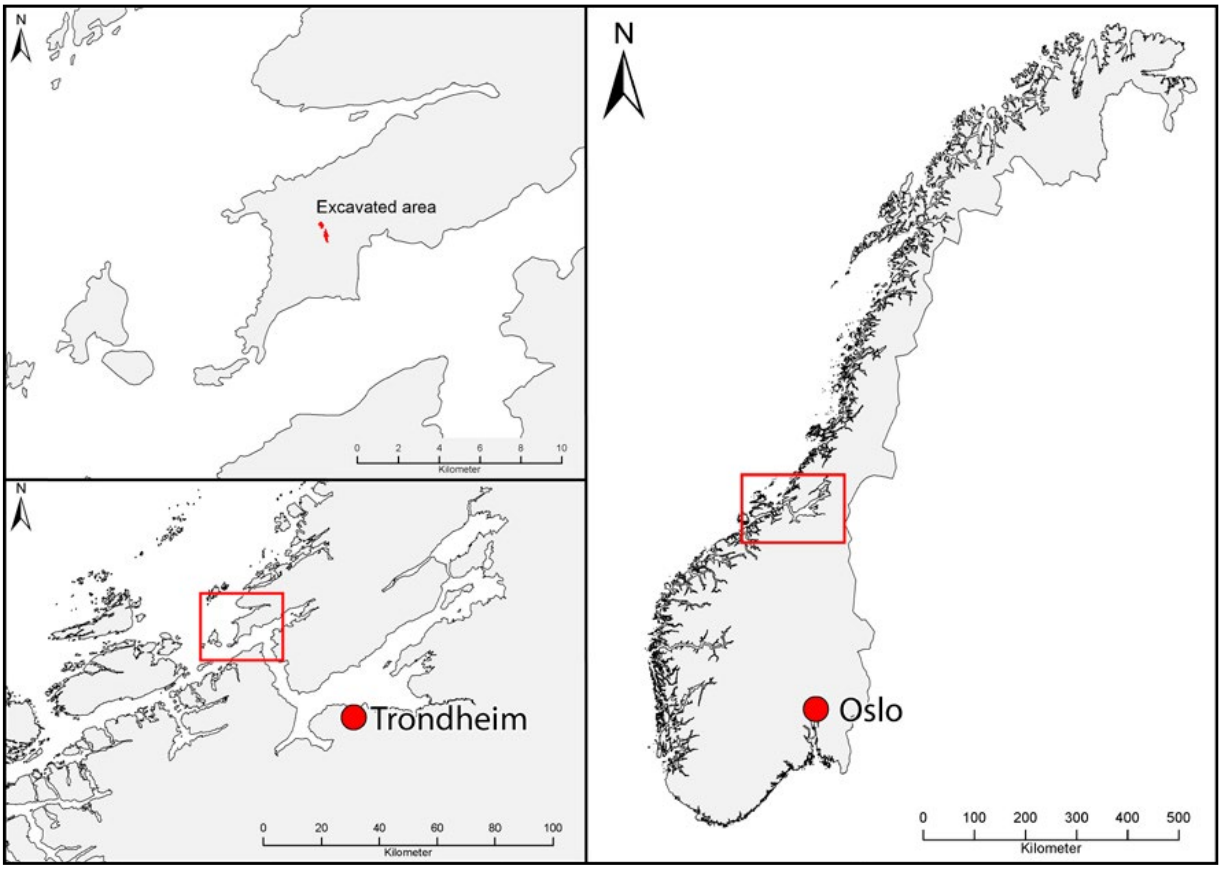

Figure 1. The location of the excavated area at Vik. Map: Magnar Mojaren Gran, NTNU University Museum.

shards as well as some tools (slickstone, whetstone), slag, and animal bones (Aanderaa 2015), and is therefore comparable to the layers at Vik, at least when considering finds and layer size. At Skadberg in Sola, a shallow waste layer both covering and containing different types of features, such as some pits and a coal bed, was also placed directly outside a three-aisled building. This layer contained unburnt stones, pottery and burnt bones (Husvegg, Soltvedt & Dahl 2017), thus appearing similar to the Vik waste layers in both finds and activities. The feature at Skadberg has been interpreted as a remnant of a succession of waste pits (*ibid* p.46), which means that its apparent resemblance to the large waste layers at Vik is superficial.

There may be several reasons why similar waste layers are uncommon: soils in Norwegian agricultural landscapes tend to be acidic and not favourable for preservation of organic materials. Settlement excavations before the breakthrough of the top soil stripping method (e.g. Petersen 1933, 1936, Grieg 1934, 1938) focused on the buildings, thus missing possible waste heaps or layers located between buildings or on the outskirts of the settlement. Today's mechanical top soil stripping uncovers much larger areas, but modern-day agricultural activities have

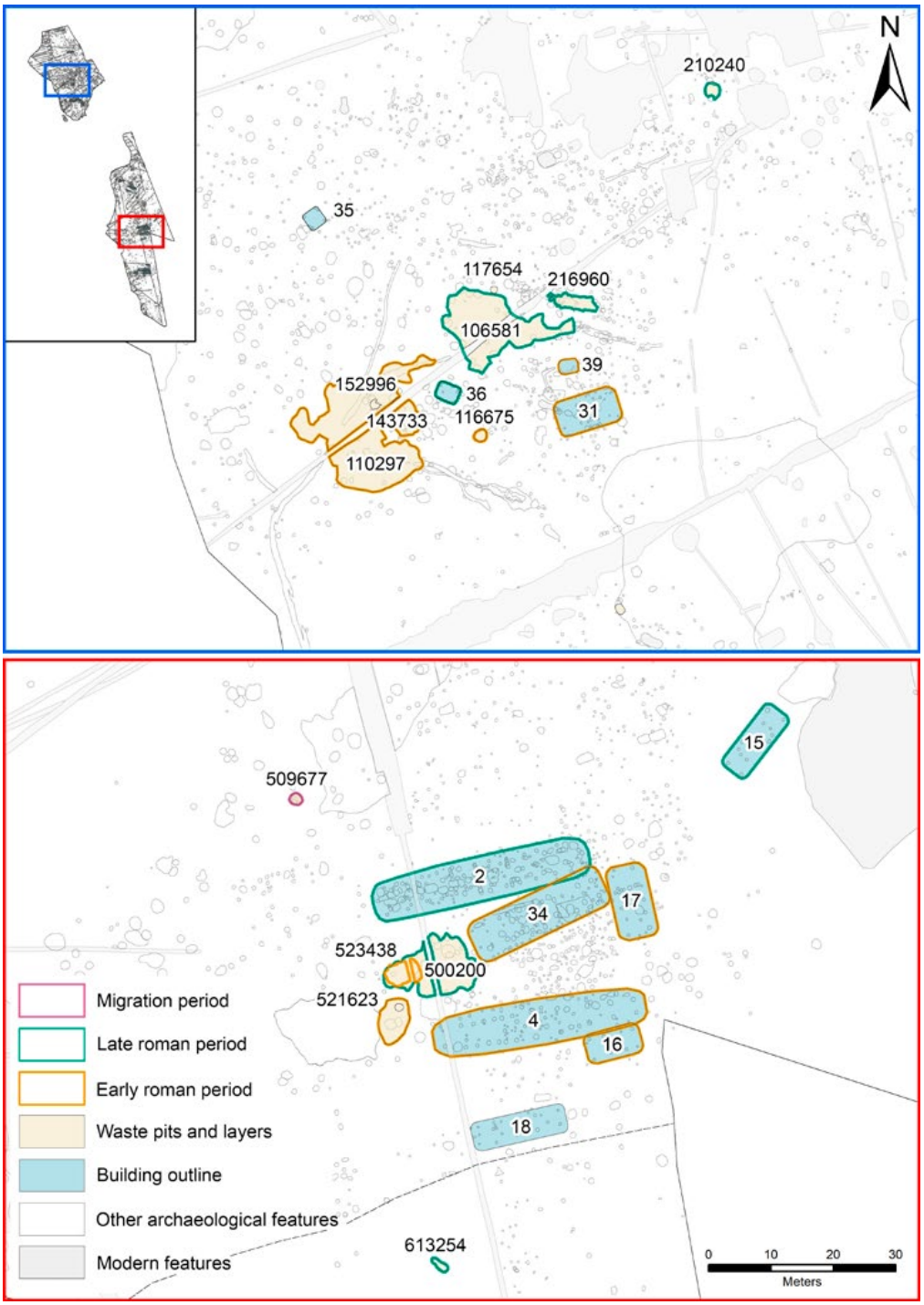

Figure 2. Roman Iron Age settlements at Fields A and E (north) and C (south) with building remains and waste deposits. Illustration: Magnar Mojaren Gran, NTNU University Museum.

possibly destroyed traces of waste heaps and shallow layers before excavations take place (e.g. Løken et al. 1996, Høgestøl et al. 2005, Drewett 2011, Renfrew & Bahn 2016).

Favourable preservation conditions rendered the waste deposits at Vik rich in finds and osteological material, and they provided a great deal of information concerning a wide range of farm activities. (Traces of day-to-day activities are rarely observed through the building material alone.) In addition, the Vik waste deposits yield insight into spatial and temporal organisation of activities in two contemporary Roman period farms (Field A, northern area and Field C, southern area), located a mere 500 m apart.

This article presents and analyses the Roman period waste contexts found at Vik at Ørland. It aims to relate activities revealed in the waste deposits to both chronological developments and functional divisions of the farms at Fields A and C in the northern and southern part of the excavation area at Vik, in order to gain insight into the chronological, spatial, and social organization of the Roman period farms. The main research questions are:

- How did the waste deposits and activities indicated through these deposits, relate temporally and spatially to the farms at Vik?
- What types of waste did the deposits contain?
- Which activities does this material indicate?

MATERIAL AND METHODS

This article investigates six complex waste deposits (106581 + 216960, 110297, 210240, 500200, 509677, 521623) and six less complex waste pits (116675, 117191, 117654, 143733, 152996, 613254), mainly dating to the Roman period (Figure 3). These deposits were unusually rich in finds and osteological material, comprising 670 finds and thousands of animal bones (Table 1).

The large waste deposits in Fields A, E and C were related to two farm areas dated within the Roman period, one in the north and one in the south of the excavation area. Both areas were fully excavated (Figure 2). The buildings of the farm in Field C were significantly better preserved than the possible buildings found in Fields A and E, which had been heavily disturbed by modern activity. However, considerable pre-historic activity in Fields

Area	Field	Type	ID	No. finds	NISP osteology
North	A	Large waste deposit	106581*	78	3558
		Large waste deposit	110297*	315	3136
		Small waste pit	116675	1	1
		Small waste pit	117191	2	-
		Small waste pit	117654	2	6
		Small waste pit	143733	-	2
		Small waste pit	152996	2	101
	E	Large waste deposit	210240	94	4686
South	C	Large waste deposit	500200*	166	925
		Large waste deposit	509677	6	768
		Large waste deposit	521623*	9	402
	D	Small waste pit	613254	2	9

Table 1. *Context overview (* = feature has several related features within its use phase; finds and NISP in related features are included in the total count).*

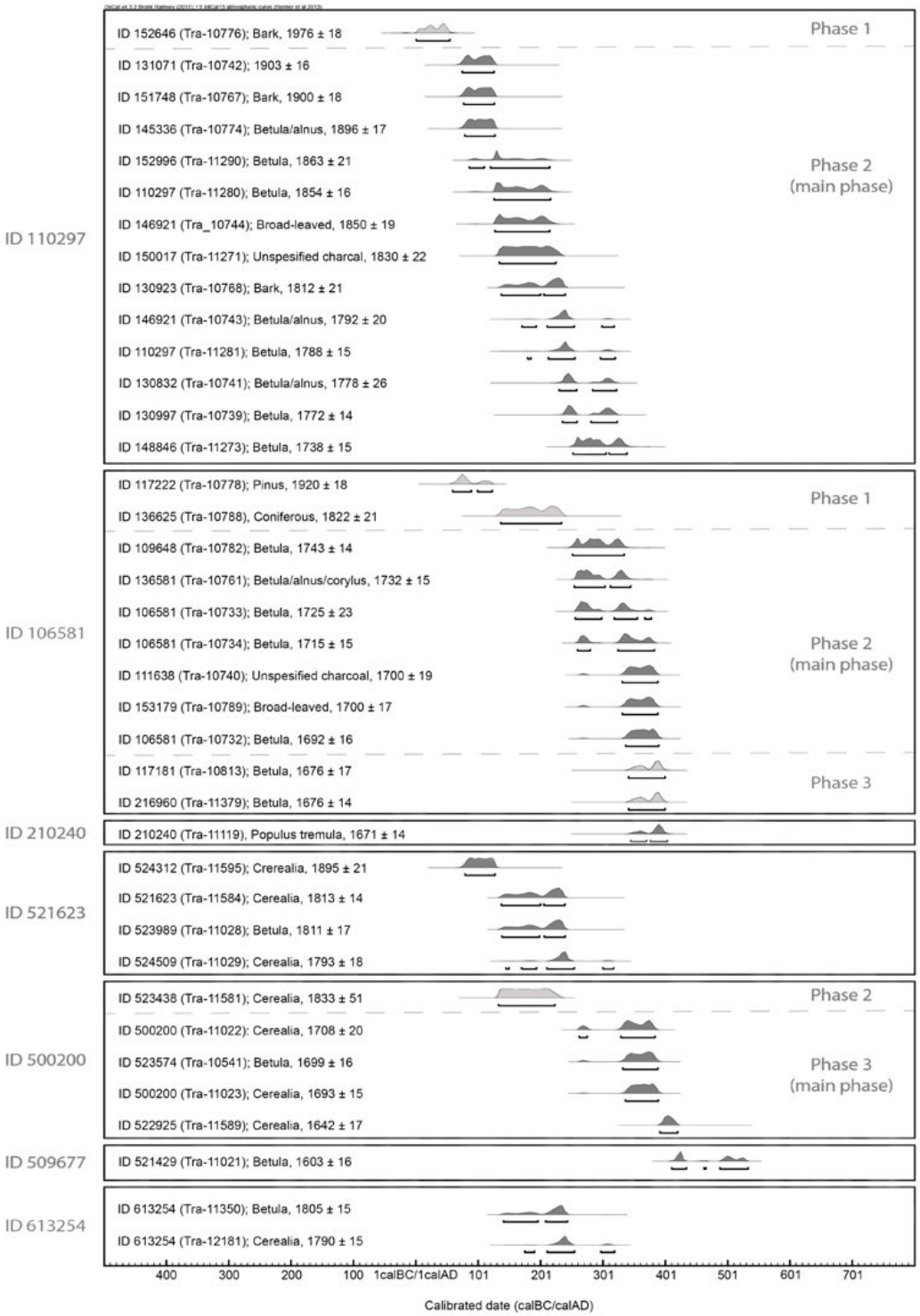

Figure 3. Dates from waste deposits with related features. Illustration: Magnar Mojaren Gran, NTNU University Museum.

A and E, comprising several waste deposits, nearly 200 cooking pits, and numerous postholes, bore witness of a solid Roman period settlement even though buildings with residential functions were not discovered during the excavation. In Field D, approximately 100 m south of the farm in Field C, a farm from partially the same period and comparable in social standing to the farm examined in Field C was excavated. It proved to lack the large waste layers found in Fields A/E and C (Heen-Pettersen & Lorentzen, Ch. 6).

The waste deposits were generally preserved in shallow depressions in the subsoil (Figure 4). In Field C the ground consisted of sand with a high shell content, while in Field A the sandy soil seemed partially waterlogged. Subsoil conditions and the fact that the largest deposits were preserved in depressions that protected them from modern disturbances were major contributors to their survival. The gravelly sand in Field D, lacking in calcium-rich seashells and moisture, was less favourable for the preservation of similar layers.

In Field A in the northern part of the excavation area, the two large waste deposits 106581 and 110297 were found in close proximity to each other. Both contained a high number of finds and animal bones. In the area surrounding the waste deposits features such as waste pits, cooking pits and postholes were numerous, and predominantly dated to the Roman period (Mokkelbost & Fransson 2018). Deposit 110297 seemed chronologically and spatially related to two identified buildings, Houses 31 and 39, as well as to four of the smaller waste pits in this area, 116675, 117191, 143733 and 152996 (Figure 2). Waste deposit 106581 (Figure 4) was chronologically related to a small four-post building, House 36, as well as one small waste pit 117654. There was also a spatial relationship between these two and the waste deposit, in that they were situated within a few metres of each other. Additionally, deposit 216960, a few metres to the east of deposit 106581, seemed related to the latter because of similarities in age and finds. In Field E, adjoining Field A in the northern area, a large waste deposit in the shape of a pit, 210240, containing large amounts of cockles and fish bones and a small amount of other household waste, was found. The area between and surrounding the Field A and E waste deposits had been disturbed by modern activities, so no apparent occupational buildings of the same age were found close by – for a more thorough discussion, see Mokkelbost & Fransson 2018.

Figure 4. Excavation of waste deposit 106581 in Field A. Photo: NTNU University Museum.

The two other large waste deposits 500200 and 521623 and waste pit 509677, all containing finds, animal bones and related features, were situated in Field C in the southern part of the excavation area (Figure 2). These features were related chronologically and spatially to at least two different phases of a farm found in this area (Heen-Pettersen & Lorentzen, Ch. 6). One smaller waste pit 613254 was found in the very north of Field D in the southern area, and seemed related to the farm in Field C in both time and space (Lorentzen 2018:600-601).

Methods

In the investigation of these waste contexts, different types of methods were used. Physical excavation methods and contextual assessment were applied during the excavation. Within this article, comparative analysis of 14C dates as well as of spatial and physical aspects of the contexts was applied.

Before and during excavation, the large waste deposits were investigated by means of metal detectors. The soil from the waste deposits was sifted through a 4 mm mesh. Dry soil was dry-sifted, while compact, sticky or wet soil was sifted with water. All finds and bone material found through sifting or *in situ* were 3D located using GPS/CPOS in the approximate or exact place of discovery and related to their original context. Scientific analyses such as macrofossil analyses and 14C-sampling, as well as osteological and taphonomic analyses of animal bones, were a priority (Storå et al., Ch. 8).

Special care was taken during the excavation of the waste deposit 110297 in Field A. Here, the exact find spots were documented with GPS/CPOS, thus making this deposit well suited for spatial analysis of distribution patterns and discovery of possible activity areas. In addition, micromorphological sample series enabled detailed analyses of this context as well as of the other large waste deposit in Field A, 106581 (Macphail 2016). Micromorphological analysis gives insight into soil composition, thereby contributing greatly to the analysis of activities within these layers. Unfortunately, the very dry and coarse, stony conditions of the waste layers in Field C meant that micromorphological sampling was not possible there.

RESULTS AND DISCUSSION

First, the Roman Iron Age waste deposits' chronology and their spatial relation to other contexts and settlement traces will be presented and discussed. Then, traces of activities observed within the contexts will be presented and discussed.

Temporal and Spatial distribution of Waste Deposits: Northern area

The large waste deposit 110297 in Field A formed on top of several features, among these an older cooking pit 152646, dated to the Late Pre-Roman – Early Roman period, 38 BC-AD 66 (TRa-10776, phase 1, Figure 5). The main use phase of layer 110297 lasted from AD 7 (TRa-11280) at the earliest, until AD 347 (TRa-11273) at the very latest (phase 2, Figures 3 and 5). During the main use phase, many other features were formed within the body of the layer; these consisted of cooking pits, designated waste pits and other pits, as well as at least one ditch, a clay layer and some smaller, limited layers containing waste.

Towards the end of the main use phase of layer 110297, the other large Field A waste layer 106581 started forming (Figures 3, 4 and 6). A few cooking pits 117222 (AD 29-168, TRa-10778) and 136625 (AD 131-242, TRa-10788) were situated in the same spot as layer 106581, but predated the layer (Figure 6). The latest of these pits was of the same age as most of the features from the main use phase of waste deposit 110297. However, the

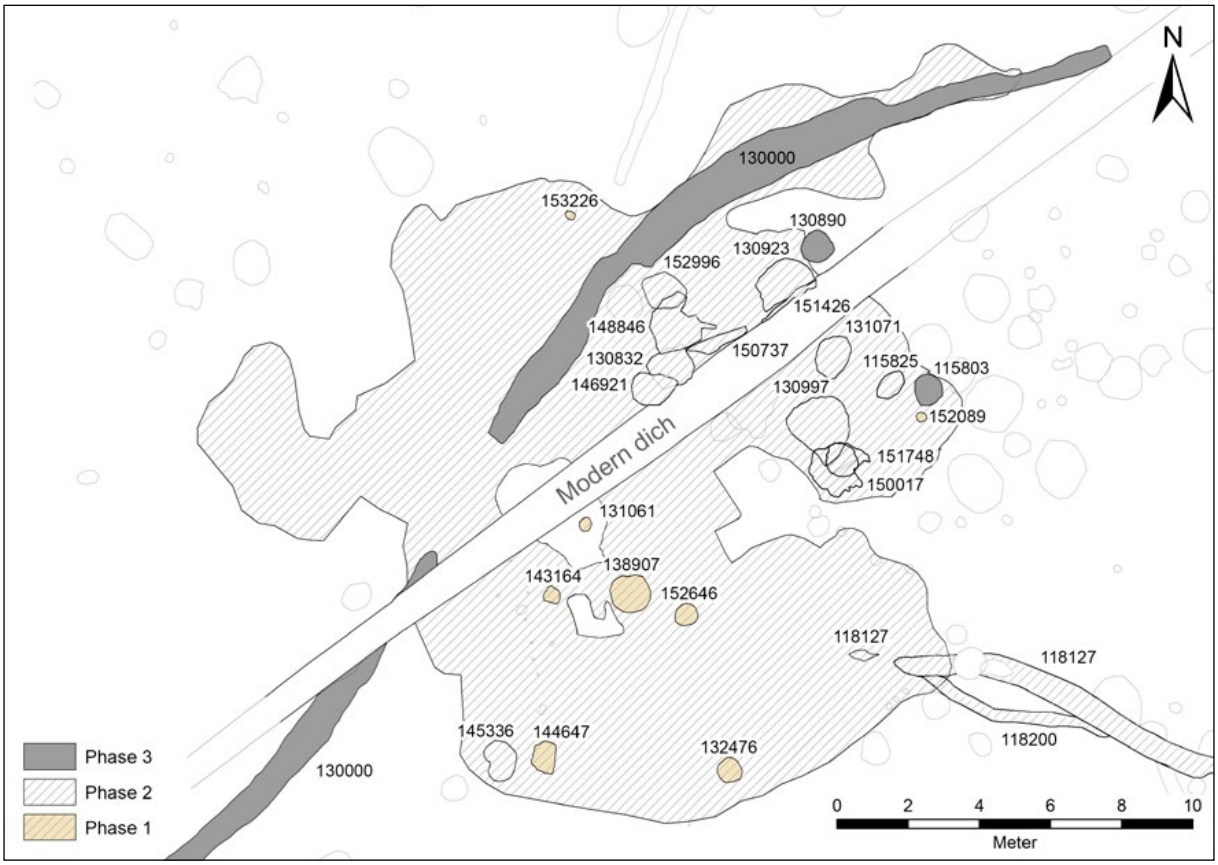

Figure 5. Field A waste deposit 110297 with phases and features. Illustration: Magnar Mojaren Gran, NTNU University Museum.

stratigraphic position of this pit, beneath the waste layer, indicated that waste deposition started later in layer 106581 than in 110297. The main use phase of layer 106581 lasted from AD 244 (TRa-10782) at the very earliest to AD 407 (TRa-11379) at the very latest (Figure 3). Like 110297, deposit 106581 also contained other features within its main use phase, but here these features consisted solely of cooking pits. A smaller waste layer 216960, dated to AD 337-407 (TRa-11379), and positioned 2 m north of the larger deposit 106581, is regarded as a continuation of the larger deposit. Despite its small number of finds and meagre amount of animal bones, the smaller deposit is included in the interpretation of the larger deposit 106581 in this article because of the proximity, similarity in age, accumulation practice, and finds and osteology deposition.

The use phases of layers 110297 and 106581 might overlap somewhat (Figure 3); however, this could be a result of uncertainties in the calibration of the 14C dates, and may not represent simultaneous use of the layers. Nevertheless, these layers were clearly separated, with no spatial overlap, which might indicate an intentional separation of two contemporary features, and therefore a period of simultaneous use. Based on the collected 14C

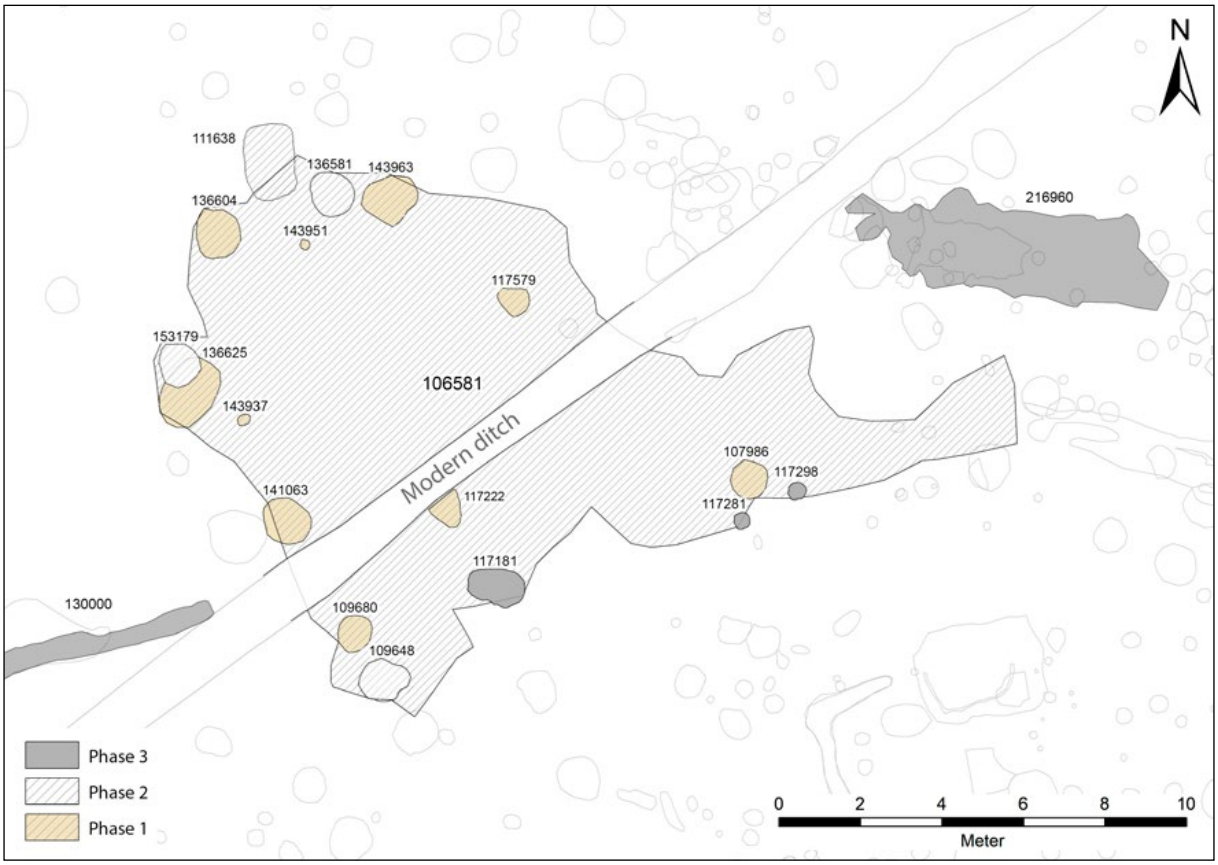

Figure 6. Field A waste deposit 106581 with phases and features. Illustration: Magnar Mojaren Gran, NTNU University Museum.

dates (Figure 3), there is little doubt that layer 110297 was the first of the two to be formed, and that 106581 was the last layer to be abandoned, thus demonstrating the chronological relationship between the two.

The third large waste context in the northern area was the large waste pit 210240 in Field E, which was of nearly the same age as the latter part of the main use phase of the waste layer 106581 (Figures 2 and 3). This indicates that waste pit 210240 was constructed during the end of the life span of waste layer 106581. Some of the waste in pit 210240 in Feld E could be interpreted as deriving from a smithy or a similar context related to metalworking (Table 6). In the Late Iron Age, smithies were often placed at a distance from the rest of the settlement. It has been argued that was either for practical or religious reasons – the practical reason being the fire hazard to nearby buildings, the religious reason being connected to religious or mythological notions regarding the smith's role and status in society (Loktu 2016:262, Sauvage 2005:63-69). This might be the case here: the waste pit's remote location might be due to its connection with a (now removed) smithy in this area, originally placed far from the rest of the settlement.

Temporal and Spatial distribution of Waste deposits: Southern area

The dates from waste layers 500200 and 521623 in the southern area indicated three phases of waste activities (Figures 3 and 7). As opposed to the northern area, traces of large farm buildings were preserved in Field C. Hence, the relationship between waste layers and settlement can be discussed more thoroughly for the southern area.

In the southern area, the first waste deposition probably started with layer 524312, dated to AD 56-209 (TRa-11595). This feature was very small, and had a clear, rounded shape, which might suggest it originated as a pit. The main waste layer 521623 covered this pit/layer (Figure 7). Dates of features related to waste layer 521623 indicate activity during the Early to Mid-Roman period (Figure 3). Chronologically and spatially, layer 524312 was related to Longhouse 4, and perhaps Longhouse 34, from the Early Roman occupational phase of the Field C farm. Houses 34 and 16 are interpreted as constituting a spatial layout of the farm called *parallel settlement*, while Houses 4 and 17 together constitute an *angled settlement* (Heen Pettersen & Lorentzen, Ch. 6). Because of the overlap in dates from these four houses, it is impossible to determine the succession here. However, it is possible to define the central yard of each of these two settlements: in

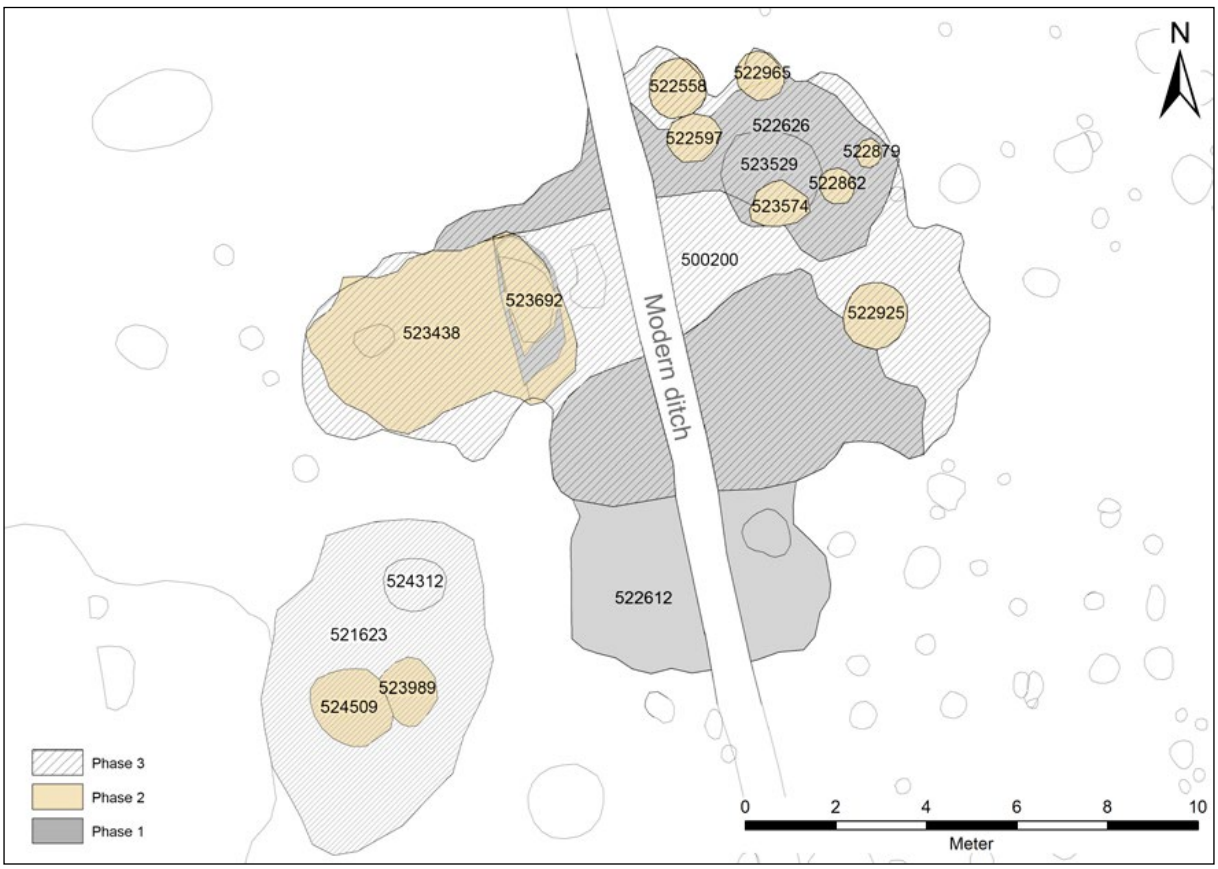

Figure 7. Field C waste deposits 500200 and 521623 with phases and features. Illustration: Magnar Mojaren Gran, NTNU University Museum.

the parallel settlement, the central yard is defined as the space directly between the houses, while in the angled settlement, the central yard is defined as an imagined square of which the houses represent two sides. Thus, waste deposition during the Early Roman period took place in the western outskirts of the central yard regardless of farm layout (Figure 2; Heen-Pettersen & Lorentzen, Ch. 6).

Waste pit 523692 to the north of 521623 was not dated, but probably belonged to phase 1 of this complex of features. The waste pit was sealed off with a clay layer 523438, possibly during the Early Roman period (Figures 3 and 7). Waste deposit 500200 appears to have formed on top of the clay layer, thus indicating that the oldest pit was deliberately closed off before new waste accumulated in the same area.

The dates of the large waste layer 500200 span from AD 256 at the earliest (TRa-11022) to AD 397 at the very latest (TRa-11023), both dates are based on the dating of *Cerealia* samples. The layer contained a number of cooking pits within its use phase. Cooking pit 523574, dated on a *Betula* twig, had the same dates as the layer, and was probably constructed during the layer's main use phase. The large cooking pit 522925, however, had an overlap of only 50 years with waste layer 500200 (Figure 3). Yet, since stratigraphic relations proved the layer to cover the cooking pit, the pit must be of the same age as the layer, probably pinpointing the use phase of this layer to the late 5th century (c. AD 350-400). This is in concordance with the dates of House 2 and House 15 in Field C (Figure 2). These two buildings form a third type of settlement defined as the *dispersed* or *scattered settlement* (Heen Pettersen & Lorentzen, Ch. 6).

The large waste pit 509677 to the north of the Roman period farm in Field C was dated to the Migration period (AD 403-535, Tra-11021). It is however possible that this pit was constructed during the main use phase of House 2 and House 15 in Field C, thus representing waste disposal of the final use phase of this farm.

The central yard of the Late Roman/Early Migration period Houses 2 and 15 in Field C, which constituted the latest and northernmost phase of the farm cluster, is believed to have been located north/northeast of these buildings (Heen-Pettersen & Lorentzen, Ch. 6). In this phase of the farm, waste deposition no longer seemed to take place within the central yard, as indicated by the location of the contemporary waste layer 500200 to the south of House 2, and of waste pit 509677 some distance northwest of House 2.

One smaller waste pit 613254 situated 30 m south of House 4 was probably related to one of the phases of the above-mentioned Roman period farm, although which phase is unclear, because the dates from this pit cover all phases of the farm (see Figures 2 and 3).

Waste in Time and Space: Discussion

The first waste layers formed during the Early Roman period (AD 0-200), in relation to Early Roman farms in Fields A/E and C. The Early Roman waste deposits were abandoned around the middle of the Roman period. There are indications that the abandonment of the waste deposits correlates with the abandonment of contemporary buildings, namely in Field C. Waste pit 523692 appears to have been sealed off with clay layer 523498. The sealing was potentially contemporaneous with the abandonment of House 34, and perhaps of House 4. Both these longhouses seem to have been cleaned in connection with abandonment (Storå et al., Ch. 8), and a deposition of three ceramic vessels in a posthole in House 34 after abandonment indicates closing rituals (Heen-Pettersen & Lorentzen, Ch. 6). The sealing of a connected waste pit could indicate that abandonment rituals also affected the waste disposal area. As suggested by Haak (2016:85, 94-95) the

closing and abandonment of waste pits and layers may coincide with a change of ownership or major refurbishments of the layout of the buildings or farms related to the waste contexts. In Field C, 14C dates are nicely grouped within either the Early or the Late Roman period (Figure 3), and thus canindicate a sharp division between the Early and Late Roman activities. In Field A, on the other hand, the picture is less clear, and 14C dates indicate that the large waste layers 110297 and 106581 may have co-existed and terminated during the Late Roman period (Figures 3 and 8).

The evidence suggests that the location of waste deposition areas in relation to farm buildings changed from the Early to the Late Roman period. Waste deposits moved from the outskirts of the central yard in the older period to entirely outside the yard in the later period.

Early Roman waste deposits 521623 and 523692 in Field C were established few metres to the west of contemporary Longhouses 34 and 4. After abandonment and closing of both buildings and waste deposits, a new waste layer 500200 formed partially on top of the sealed-off deposit. Thus, waste deposition continued in the same area in the Late Roman period. However, farm buildings were moved. House 2 was built to the north of Houses 34 and 4, and the yard with activities connected to House 2 seems to have been moved to the north of this building (Heen-Pettersen & Lorentzen, Ch. 6). Thus, although it remained in the same spot as before, the Late Roman waste disposal area (500200 with phase 3 features) now found itself outside the main yard (Figure 2). Towards the end of the occupation phase of the Field C farm, pit 509677 containing traces of specialised activities and waste was formed a good 20 metres to the north of the farm area. This falls into a pattern in which the distance between the central parts of the farm, i.e. the farm buildings with their yards, and waste disposal areas increased during the Late Roman period.

In Field A, the Late Roman waste layer 106581 was established a few metres east of the older layer 110297, thus also here indicating a continued use of the previously established waste disposal area. However, surrounding 14C dates suggest that occupation moved towards the north in the Late Roman period (Mokkelbost & Fransson 2018). This could mean that the distance between the occupied area and the waste deposits increased in the Late Roman period, in the same manner as in the south. At the same time, the curious waste pit 201240, containing a large amount of cockles and fish bones, was established on the eastern outskirts of the assumed farm area in Field A/E.

Waste layers were most in demand during the Late Roman period (Figures 2 and 3). This coincides partially with the general activity in the fields that included Roman period waste contexts (Fields A, C, D and E; Ystgaard, Gran & Fransson, Ch. 1).

Activities and Functions indicated by Waste Deposits: The Northern Area

The two waste layers 110297 and 106581 in Field A both seemed to result mainly from deposition of household waste (animal bones, broken household items and latrine/byre) and discharge from cooking pits. The oldest layer 110297 contained the most finds (Figure 8). A high content of animal dung also indicates that manure was stored in and possibly distributed from these waste deposits. Both deposits were probably accumulated over time. Regular removal of waste and byre would help to insure sanitary conditions in and around the buildings. Contemporary parallels of regular cleaning are observed in Østfold, Southern Norway, e.g. House 3 at Ringdal, Larvik (Gjerpe & Østmo 2008), and House I (the hall) at Missingen, Råde (Bårdseth & Sandvik 2007). The houses were swept regularly in

order to transport waste out of the buildings through one of the entrances (Gjerpe & Østmo 2008:61). Yet, in these cases, waste was not deposited in the same deliberate way as at Vik, and it was preserved only in wall ditches.

Waste pit 210240 in Field E, on the other hand, consisted mainly of disposed cockles and fish bones, interspersed with a few bones from farm animals as well as a small amount of metalworking waste and nails. There were no traces of latrine or byre waste, nor of manure in the deposit. The contents of pit 210240 might have been deposited over a short period, attested to by both archaeological and dietary observations: in a deep pit left open over a long time, the sides will eventually fall in due to gravity and erosion, and mineral layers will accumulate on top of depositions in the pit. Continued deposition over an interval of time should have created distinct stratigraphical layers. If the pit was kept up by regular re-shaping of the sides, the action of re-digging the pit would have created traces along the pit's walls, and stratigraphical layers would have formed here too. In addition, due to the limited food value of molluscs, great quantities are required in order to feed even a few people, and there are estimates showing that 3 months' supply of molluscs for 100 people would weigh as much as 3 tons (Fagan & Durrani 2016:276). Therefore, the undisturbed vertical shape of pit 210240 and low degree of mineral layer formation, as well as the uniform nature of the fill (13000 cockles of the same type), provide evidence of deposition within a rather short period perhaps representing a single episode (a feast?), which nevertheless may have lasted for days.

The most frequent material found in all the waste contexts in the northern area was osteological material - almost 8kg in the form of more than 11,000 fragments (NISP – Number of Identified Specimens) originated from these contexts (Table 2). No specific

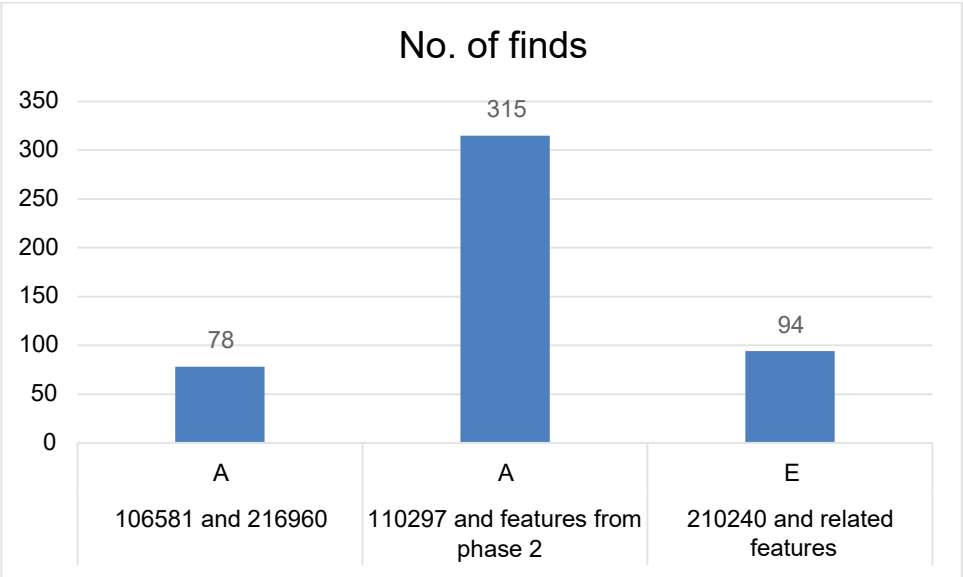

Figure 8. Total number of finds, osteology excluded, within the large waste deposits in the northern area. Illustration: Marte Mokkelbost, NTNU University Museum.

spatial concentrations of different species of animals were observed within layers 110297 and 106581, confirming that the contexts contained secondarily deposited osteological waste, deposited on a casual but regular basis.

All three large waste contexts exhibited evidence of animal husbandry, hunting and fishing, although with variations regarding species and frequency of species (Aalders et al. 2017a, Aalders et al. 2017b, Storå et al. Ch. 8). A fishhook found in pit 210240 was another indication of fishing (Table 3). Foraging and collection of seashells and cockles was also important, cockles/seashells were found in all the main contexts (Table 4). The huge quantity of cockles consisting of approximately 13,000 specimens (almost 350 litres) found in the large waste pit 210240 in field E, together with a large amount of fish bones. The uniform nature of the cockles in this pit, all of the same type, as well as the quantity of fish bones, attests to large-scale consumption of seafood, though perhaps over a limited period. The bones in this pit consisted of 97% fish bones, which was noticeably different compared to the composition of bones in the layers in Field A (see also Table 3 in Storå et al., Ch. 8).

Similar waste management strategies are known from other periods and other parts of the world, as in the Bronze/Early Iron Age midden at East Chisenbury on Salisbury Plain, Wiltshire, England (McOmish 1996). This is an enormous, circular midden more than 2 m deep and 200 m in diameter, containing organic material and artefacts with a large ceramic component. The midden has not yet been fully excavated, but there have been several surveys and trial excavations (e.g. McOmish 1996, Wessex Archaeology 2017). One of three hypotheses regarding the formation of this large midden is that it was formed as a result of "sporadic and massive depositional events incorporating the consumption and disposal of huge quantities of meat, the disposal of pottery, some associated with food processing and presentation, and the incorporation of large quantities of animal and human bedding" (Tubb 2011:47). The "sporadic and massive depositional events" could have been feasts – ritual events where food played an important

	110297	106581	210240	Small waste pits
NISP	3136	3558	4686	110
Weight (g)	4047.81	3055.04	757.65	101.47
Species (interpreted)				
Domesticated	Cattle, horse, pig, sheep, sheep/goat	Cattle, goat, horse, pig, sheep, sheep/goat	Cattle, pig, sheep/goat	Cattle, sheep/goat
Wild animals	Deer, moose, red deer. Seal, whale	Moose, red deer. Harp seal, Harbour seal, seal, whale	Seal	
Fish	Atlantic cod, codfish, common ling, pollock	Atlantic cod, codfish, common ling, haddock, herring, ling, pollock, righteye flounder	Atlantic cod, codfish, common ling, haddock, herring, pollock	Atlantic cod, codfish, pollock
Birds	Little auk, great cormorant	Galliformes, European herring gull?	Anseriformes (duck), falconiformes (falcon)	
Other	Canid, human (tooth, toe bone), otter	Canid		

Table 2. *Osteology within the northern area main waste contexts.*

Provenience	Type	106581 and 216960	110297 and features from phase 2	210240 and related features	SUM
Found in all three contexts	Flint flake	2	19	1	**22**
	Grindstone	2	11	1	**14**
	Pottery	10	109	1	**120**
	Rivet	49	4	25	**78**
Found in both waste layers	Bead	1	3		**4**
Found in both Late Roman contexts	Chisel	1		1	**2**
	Nail	4		1	**5**
	Needle	1		1	**2**
106581 only	Belt buckle	1			1
	Belt stone	1			**1**
	Iron fitting	2			**2**
	Whetstone	1			**1**
110297 only	Birch bark strip		1		**1**
	Glass fragm.		2		**2**
	Grindstone plate		3		**3**
	Handmill		1		1
	Knife		1		**1**
	Staurolite		4		**4**
	Textile fragm.		1		**1**
	Trident		1		**1**
	Whetstone prep.		1		**1**
210240 only	Comb, bone			1	**1**
	Dagger, iron			1	**1**
	Fish hook			1	**1**
	Iron fragment			2	**2**
	Loop, iron			1	**1**
	Ring			1	**1**
	Spike, small			2	**2**
SUM		75	161	40	276

Table 3. *Household items in the northern area.*

role. The two other hypotheses postulate formation by means of accumulation of waste from domestic settlement, or by tertiary disposals – deposits first accumulated elsewhere and then moved (*ibid.*), all of which resemble the waste management in several of the waste deposits at Vik, e.g. 110297, 106581, 500200.

The small waste pits surrounding the large waste layers naturally reflected smaller amounts of bones and fewer species. Mammal bones were the most frequent within these pits. The pit 152996, which was found within the main use phase of the large waste layer 110297, contained the most bones and varieties of species. Curiously, and probably not

Activities		106581	110297	210240	Small waste pits
General household activities	Cooking (cooking pits)	x	x	x	x
	Fishing/hunting and consumption	x	x	x	x
	Foraging (seashells/cockles) and consumption	x	x	x	
	Import (glass/amber beads)	x	x		
Household production	Metalworking		x	x	
	Pottery production		x		
Farming/ agriculture	Fertiliser production	x	x		
	Flour production/tool maintenance (grindstones/grindstone plates/whetstone)	x	x	x	
	Animal husbandry	x	x	x	x
	Grains	x	x	x	x

Table 4. *Activities observed in the northern area contexts.*

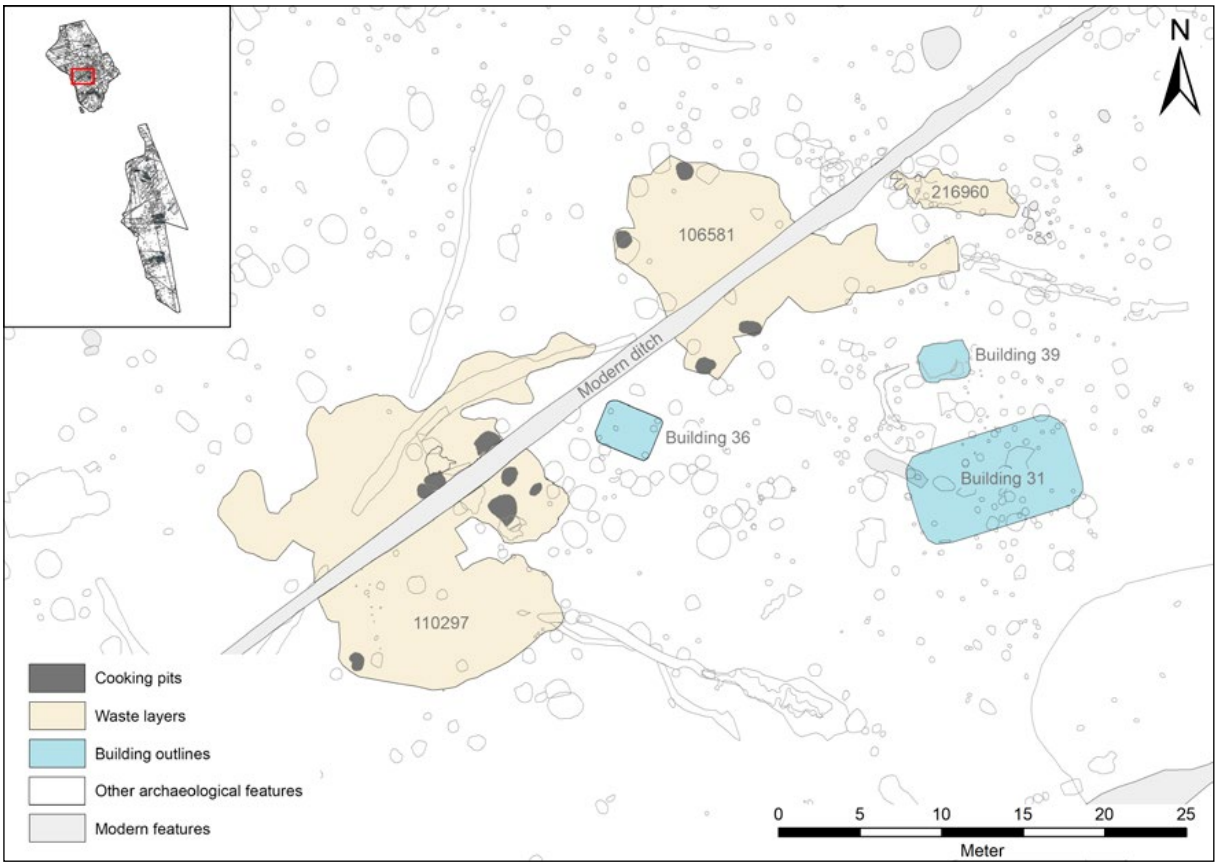

Figure 9. Cooking pits within the main use phase of waste deposits 110297 and 106581 in Field A. Illustration: Magnar Mojaren Gran, NTNU University Museum.

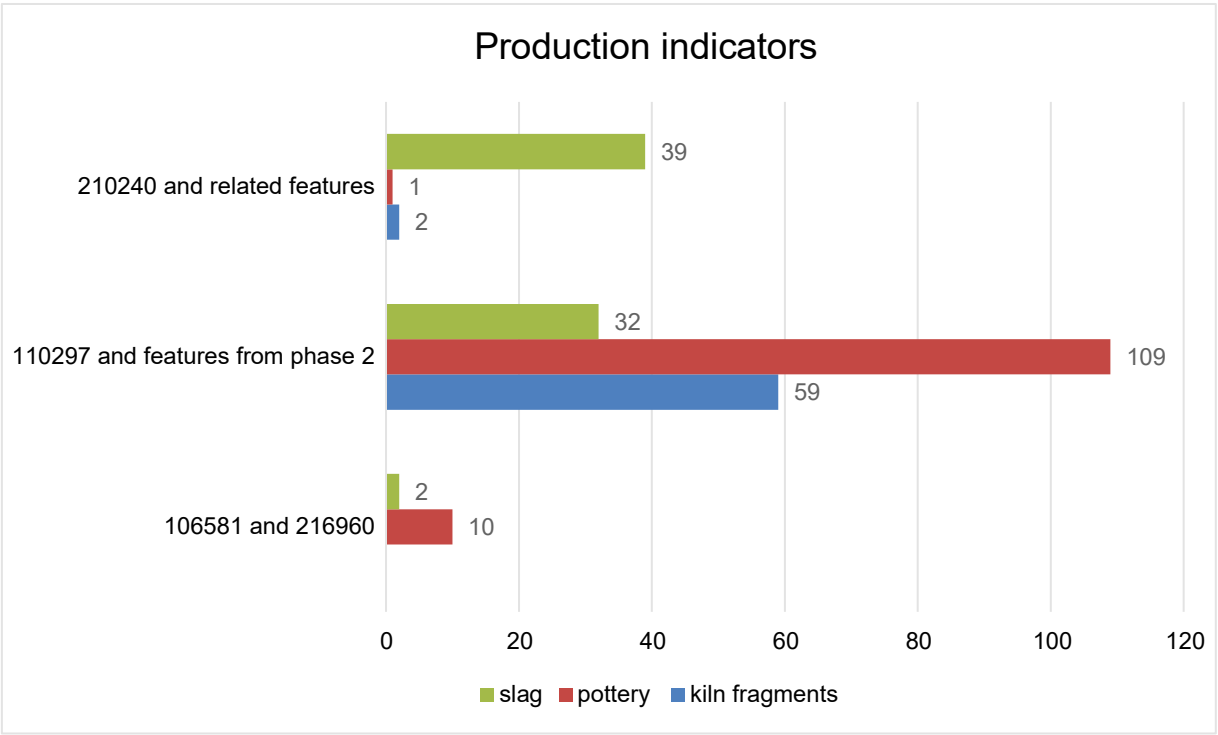

Figure 10. Production indicators in the large waste contexts in the northern area. Illustration: Marte Mokkelbost, NTNU University Museum.

linked to the diet, a human tooth was found within cooking pit 130832 in the main use phase of the largest and oldest waste layer 110297. For more information on the osteology, see Storå et al. (Ch. 8).

In addition to osteological material, both layers included cooking pits in their use phases, indicating that some of the cooking took place within the actual waste layers themselves (Figure 9). When looking at the items that could be related to the household (Table 3), it is clear that the most frequent find was pottery. Pottery was used for storing and cooking food and fluids, as well as for serving food and for drinking (see Solvold, Ch. 9). Pottery sherds were found in all three northern waste contexts, although 90% of it was found in the Early Roman waste layer 110297 (Figure 10).

The small Early and Late Roman waste pits surrounding the waste layers showed many of the same characteristics as the large waste deposits 110297 and 106581 regarding colour and observations (Table 5). They contained discarded household items and/or animal bones that were similar to those found in the waste layers, and all contained fire-cracked stones.

All three large waste contexts included finds of tools and personal items (Figures 11 and 12). They also bore witness to activities related to tool maintenance and the grinding of grains, demonstrated by the deposition of grindstone plates and whetstones for sharpening tools, and grindstones, a handmill and some staurolites (Figures 11, 12 and 13, Table 3). A staurolite is a red-brown to black, mostly opaque, mineral, which is a form of garnet

Feature type	Context id.	Fill colour	Birch bark	Animal bones	Burnt animal bones	Burnt clay	Charcoal	Raw clay	Finds	Fire-cracked stone	Pottery	Sea shells	Slag	Wood
Waste layer	106581	*		x	x	x	x		x	x	x	x		
	110297	*	x	x	x	x	x	x	x	x	x	x	x	x
Large waste pit	210240	*		x	x	x	x		x	x	x	x	x	
Small waste pits	116675	Dark grey			x	x			x	x	x			
	117191	Dark brown					x		x	x	x			
	117654	Dark brown		x	x				x	x				
	143733	Greyish brown/ brownish grey		x			x			x				
	152996	Dark brown		x			x	x	x	x				

Table 5. *Observations in waste contexts in the northern area. * = see Table 7.*

stone. The staurolites found at Ørland should probably not be regarded as jewellery, but as remnants from millstones like those from the quarry at Selbu, which were rich in staurolites (Figure 12, Grenne et al. 2008).

The two large waste layers in Field A contained a few imported items, such as two amber beads and two blue glass beads (Table 3, Figure 12). The amber beads might have originated from countries around the Baltic Sea (e.g. Vinsrygg 1979:28), while the glass beads might be of western European provenance (e.g. Callmer 1977:177).

The large waste layer 110297 differed from the other northern contexts in that it displayed solid evidence of the production of pottery and metalwork in the form of kiln remnants and slag, and also pottery (Figures 14 and 15). Analysis of two kiln fragments from the waste layer 110297 showed that the sand and silt mixed clay had been fired/heated up to temperatures of 900-1000°C. These temperatures could be associated with metalworking (Brorsson 2016), but the high temperatures do not exclude production of e.g. cookware pottery/pots for cooking, which need to withstand shifting temperatures of between 500°C and 1500°C, over an open fire (Rødsrud 2012:79, 316). The characteristic shape and "holes" of hardening gaskets related to metalworking (e.g. Gjerpe et al. 2008:103, fig. 6.35) were also lacking, strengthening the impression that these were kilns for pottery production.

The large waste layer 110297 and the large waste pit 210240 contained most of the slag found in the northern area, indicating metalwork in relation to these deposits. However, despite containing only 25% of the slag fragments, the collected weight of the slag from layer 110297 constituted 83% of the collected weight of the slag from these contexts (Table 6), interpreted as forge-slag. Forge-slag is associated with purification of iron, while the lighter slag might be related to the hammering and

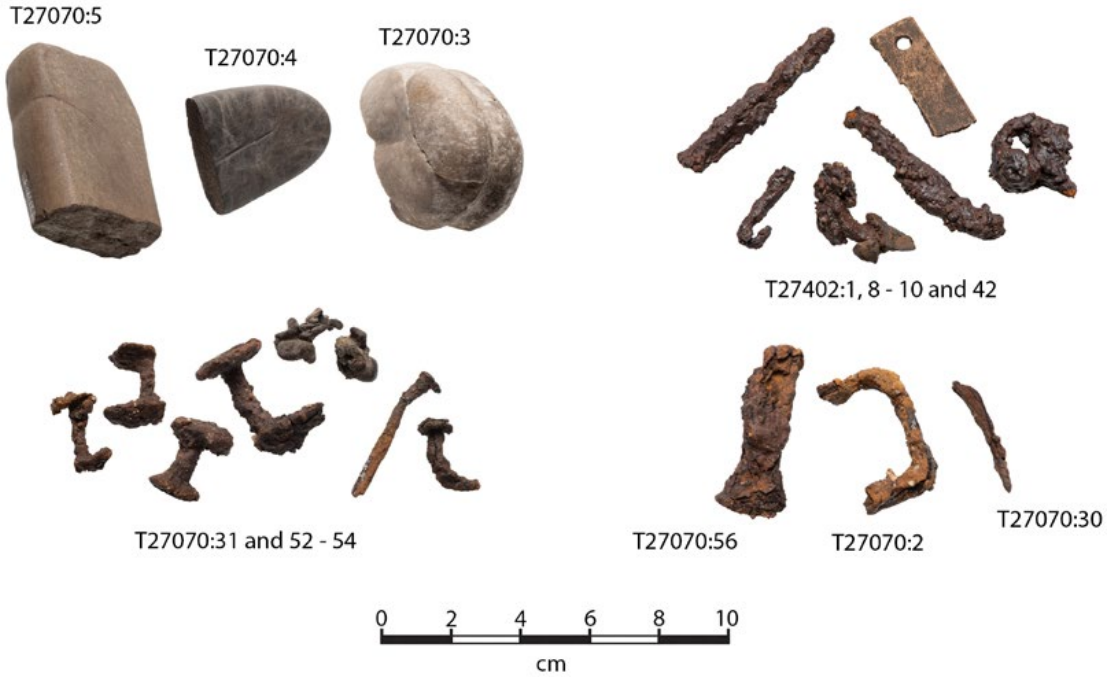

Figure 11. T27070:3, 4 and 5: Grindstone, whetstone and belt stone from waste deposit 106581. T27402:1, 8, 9, 10 and 42: Fragment of bone comb and iron artefacts from waste pit 210240. T27070:31, 52-54: Nails and rivets from waste deposit 106581. T27070:2, 30 and 56: Chisel, belt buckle, and needle from waste deposit 106581. Photo: Åge Hojem, NTNU University Museum.

Figure 12. T27070:69, 70, 182, 282 and 283: Pearls and glass fragments. T27070:178, 179 and 267: Staurolites. T27070:224: Birch bark. T27070:126 and 268: Knife and fishing tool. All finds are from waste deposit 110297. Photo: Åge Hojem, NTNU University Museum.

Figure 13. T 27070:284 quern, bottom part, from waste deposit 110297. Photo: Åge Hojem, NTNU University Museum.

	106581	110297	210240	Sum
Catalogued posts	1	32	40	73
Fragments	2	35	98	135
Weight (g)	2.8	1164.9	234.75g	1402.45

Table 6. *Slag found in the northern area main waste contexts.*

welding of iron (e.g. Gjerpe et al. 2008). Based on differences in fragmentation and weight, the slag from the contexts 110297 and 210240 is derived from different processes or stages of metalworking. However, the total amount of slag is too small to determine whether the different types of slag represent a change in metal-working practice from the Early to the Late Roman period.

Although rivets were found in all three main northern contexts, the oldest waste layer contained very few rivets, while the two Late Roman features 106581 and 210240 were rich in this type of find (Table 3). Perhaps this could indicate local production of rivets, i.e. metal working/blacksmithing. A concentration of rivets was found to the east of layer 106581 (Figure 16), probably reflecting an episode of disposal of waste containing many rivets, e.g. fragments of a boat, furniture or construction item. Additionally, both Late Roman contexts contained iron chisels (Table 3), which might possibly indicate metalworking.

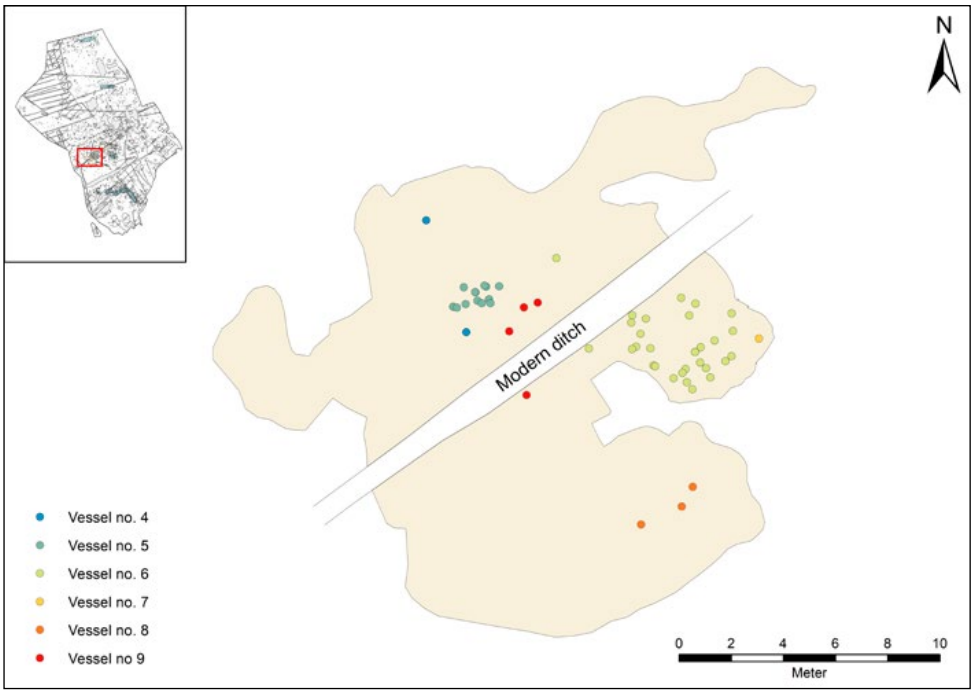

Figure 14. Distribution of pottery vessels found in waste layer 110297 and other features within phase 2 of this layer. Illustration: Magnar Mojaren Gran, NTNU University Museum.

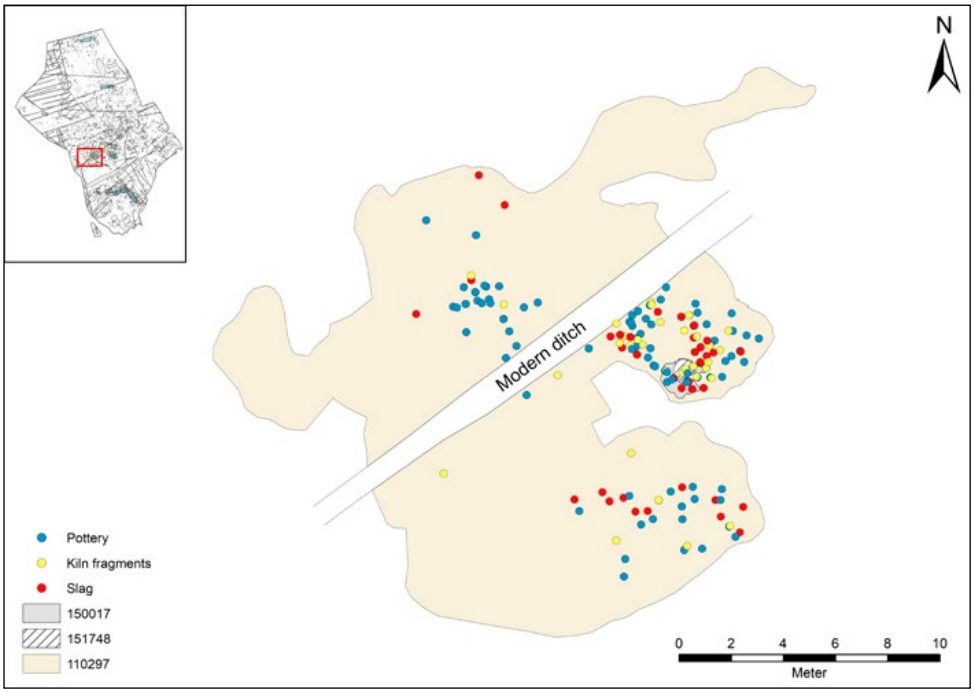

Figure 15. Distribution of production indicators (pottery, kiln fragments and slag) in waste deposit 110297, Field A. Illustration: Magnar Mojaren Gran, NTNU University Museum.

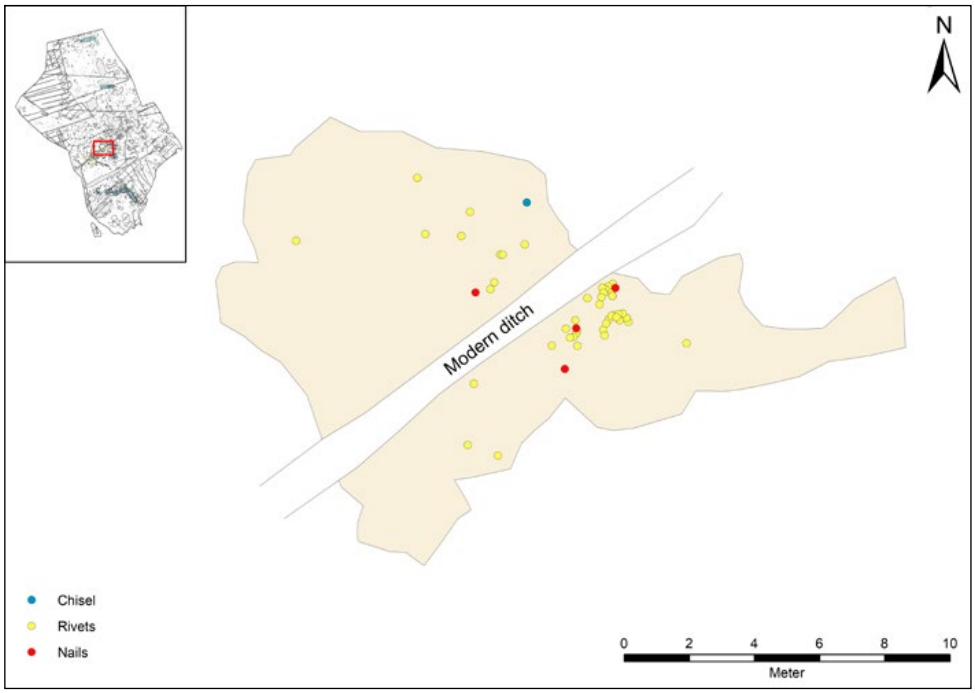

Figure 16. Distribution of nails and rivets in layer 106581 in the northern area. Illustration: Magnar Mojaren Gran, NTNU University Museum.

In layer 110297, production remnants such as slag and burnt clay were concentrated to the eastern half, near the clay layer 150017 (Figure 5). This circular clay layer, dated to AD 128-240 (TRa-11271, 1830+ 22BP) and measuring 1.65 m x 1.4 m, covered the remnants of a smaller charcoal-filled pit 151748, dated to AD 61-133 (TRa-10767, 1900+20BP) (Figure 17). Micromorphological analysis disclosed a marked difference in content between these features. The presence of possible sand-based siliceous crucible fragments indicated metalworking in relation to pit 151748. Fuel residues originating from construction debris and driftwood could be indications of industrial activity (Macphail 2016:26-27). Accordingly, it is highly likely that the slag fragments in this area were related to this small pit, strengthening evidence of metalworking in the northern area during the Early Roman period.

The 8 cm thick clay layer 150017 was high in chlorine, which indicated a marine origin (Macphail 2016:11). In size and appearance, it bore a striking resemblance to the clay basins found at Augland near Kristiansand, Norway during the 1970s. The basins at Augland measured between 1.2-1.6 m in diameter, and were up to 0.32 m deep. They were created in order to mature clay by leaving it outdoors during the winter, exposing it to changing climate and temperatures. Raw, fresh clay is not very suitable for pottery production – it needs to be processed and matured first (Rolfsen 1980:17). During sectioning of the clay layer at Ørland, it was discovered that the water level was quite high here, with rapid influx of water into the little trench dug for the section. These humid/wet conditions probably fit well with the conditions required for maturing and processing marine clay intended for pottery production or production of kilns for firing

Figure 17. Top: Plan of clay layer id. 150017, after micromorphology samples were taken in the small, water-filled trench. Bottom: Plan of pit id. 151748 as it was being emptied. Photo: NTNU University Museum.

pottery. Thus, the deposition of clay layer 150017 added to the indications of pottery production in the northern area taking place during the Early Roman period.

In addition to animal husbandry, discussed by Storå et al. (Ch. 8), traces of other agricultural practices were also found within the waste contexts in the north. Micromorphological analysis of waste deposits 110297 and 106581 confirmed that the composition of the layers varied somewhat. Both contained burnt organic and minerogenic waste and oxidised organic matter probably deriving from longhouses and/or byre, but layer 110297 included many plant and other unidentified organic fragments possibly deriving from food processing and plant use (Macphail 2016). However, it is unclear which activities the plant remains represented. The high level of phosphate in layer 106581 reinforced the impression of a waste deposit, while the lower phosphate values of the waste layer 110297 indicated that

this was a different type of deposit (Buckland et al. 2017:40), as demonstrated by the varying finds and features related to layer 110297. Layer 110297 clearly contained more material of an organic character than the other two contexts (Table 5).

The large waste layers and waste pit in the northern area contained many of the same types of fill, with minor variations. This conformity was also reflected through the fill colour of the contexts (see Tables 5 and 7). However, within pit 210240 there was a striking difference regarding the ratio of the fill elements. Whereas in the Field A deposits organic material should be regarded as mere inclusions in the fill, in pit 210240 the fill consisted mainly of cockles, while the remaining mineral ingredients should be regarded as inclusions within the cockle fill.

As indicated by the micromorphology results, the depressions where the waste layers were preserved might have had another function other than waste deposition. These areas might have been used for storing byre/latrine and other types of organic waste in order to achieve composting, so that the product could be used as fertiliser in the fields during the growing season. Similar waste management strategies are known from Europe (e.g. Jones 2012), and there is evidence that this was a common technique in the Norwegian Iron Age (e.g. Mjærum 2012). This type of storage and processing probably meant that the layers were deposited, removed and redeposited on a regular basis (R. Macphail and J. Linderholm, pers. comm. 2018). It also implies that the waste layers may not have been stable entities deposited

	110297	106581	210240
Size	235.2m^2	129.3 m^2	4.7 m^2
Colour	Mostly dark brown, sometimes reddish, interspersed with greyish areas	Dark grey to greyish black	Dark brown and black
Fill	Humic sandy silt, charcoal, fire-cracked stones, crushed shells	Gravelly sand, charcoal, fire-cracked stones	Sand and silt, fire-cracked stones, approx. 13 000 cockles
Micro-morphology	The layer seems trampled. Coprolitic bone, charcoal, abundant raw amorphous organic matter, charred plant material -> byre waste + possible latrine/cess detritus, probably collected from nearby longhouses. Short period of stasis is present. After stasis, continued deposition of latrine waste, fine bone/cess, much plant and other unidentified organic fragments and charcoal. Plant fragments may derive from food processing and plant use. (*) Low levels of phosphate = this layer seems to represent a different type of deposit than 106581. (**)	Marked fine coprolitic and human cess/mineralised pig waste content. Burnt organic and minerogenic waste, probably from longhouses. Oxidised organic matter, from wooden constructional and/or byre waste. (*) High level of phosphate = waste deposit. (**)	-
Macrofossils	Cereal, indeterminate, 1 grain. (**)	Oats (*avena*), 1 grain. Cereal, indeterminate, 1 grain. (**)	Barley (*Hordeum vulgare*), 1 grain. (***)

* Macphail 2016. ** Buckland et al. 2017. *** Moltsen 2017.

Table 7. *Composition of the three large waste contexts in the northern area.*

once and for all, but may have started out as waste heaps laid directly on the ground, while the continued removal and redeposition of waste gradually created the shallow depressions where the layers were preserved after they were abandoned. Furthermore, the presence of a pathway or cattle path 130000 in relation to these waste layers could be evidence of transport of fertilised waste from the layers to fields along the way. For more information on this path, see Mokkelbost & Fransson 2018.

Activities and Functions indicated by Waste Deposits: The Southern Area

The large Late Roman waste layer 500200 contained the most finds of the waste contexts in the southern area (Figure 18 and Table 8). It was more than three times the size of the second-largest layer 521623, yet it contained almost twenty times more finds than the other two waste contexts in this area. The finds within this context showed a random spread, although with a larger amount of finds in the eastern half, which was closest to the settlement. As in the northern area, the numerous finds, bones and related sub-contexts within this layer made it possible to relate more activities to this layer than to the other contexts in the southern area.

All of the main waste contexts in the southern area contained household waste (Table 9), which seemed to be the primary function of these contexts. Waste pit 613254 in field D contained few finds and reflected fewer aspects of the Roman age farm. However, burnt and raw clay, fire-cracked stones and variations in colour might suggest some kind of production or cooking requiring heat.

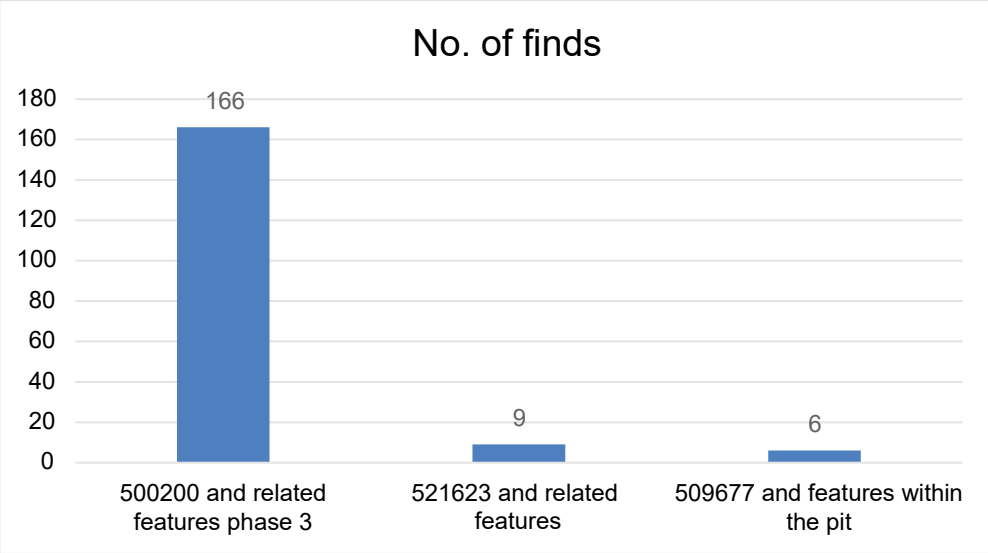

Figure 18. Total number of finds, osteology excluded, within the large waste contexts in the southern area. Illustration: Marte Mokkelbost, NTNU University Museum.

Provenience	Type	500200 and related features phase 3	521326 and related features	509677 and features within the pit	SUM
All three contexts	Pottery	63	8	1	72
Contexts related to house 2 and 15	Iron fitting	1		1	1
	Iron fragm.	5		1	6
	Rivet	64		2	66
500200 only	Arrowhead, bone	1			1
	Bead	1			1
	Clay, burnt	2			2
	Fish hook, iron	1			1
	Glass, beaker/ crucible	1			1
	Glass fragm.	1			1
	Key	1			1
	Knife	5			5
	Needle - 2 bone, 2 iron	4			4
	Ring - silver, bronze, iron	3			3
	Whetstone	3			1
	Worked stone	1			1
521326 only	Belt buckle		1		1
509677 only	Spoon, bone			1	1
SUM		157	9	6	169

Table 8. *Household items found in the southern area main waste contexts.*

Activities		Layer 500200	Layer 521623	Pit 509677	Pit 613254
General household activities	Cleaning of hearths in longhouse 2	x			
	Cooking	x	x	x	x
	Fishing/hunting and consumption	x	x	x	x
	Foraging (seashells/cockles) and consumption	x	x	x	
	Sewing/textile work (needles)	x			
	Import (glass beaker, beads, noble metals, pottery)	x			
Farming/ agriculture	Fertiliser production	x			
	Tool maintenance (whetstones)	x			
	Animal husbandry	x	x	x	x
	Grains	x	x	x	x

Table 9. *Activities observed in the southern area contexts.*

The largest waste layer 500200 contained 12 types of finds that were not found within the other two contexts, representing traces of activities not found in the other two waste contexts in the southern area (Tables 8 and 9). The stones deposited in the stony layer 523529 within the main use phase of the large layer 500200 were similar to stones used in hearths in the contemporary House 2, indicating that the stony layer consisted of material originating from cleaning and maintenance of hearths in that specific longhouse (Heen Pettersen 2018:526). Layer 500200 also showed evidence of tool maintenance in the form of whetstones and evidence of sewing in the form of needles. Several items were imported, such as a glass beaker fragment of a Roman type, similar to R.337/338 (Rygh 1885); a blue glass bead, and a silver and a bronze ring. The variation in finds in this layer was not surprising, considering that it was the largest waste context in this field, located close to substantial farm buildings (Figures 19, 20 and 21).

Cooking seems to have taken place in relation to all southern waste contexts, since the contexts included either cooking pits, fire-cracked stones (Table 10), and/or pottery (Table 8) within their main use phases (layer 500200). The osteological material indicates both animal husbandry, fishing and hunting activities. Foraging for and consumption of shells were evident in all contexts.

Pottery was the only household item found in all three waste contexts in the southern area. Most of it was found within the largest waste layer 500200, which contained sherds from 22 different vessels. (Solvold, Ch. 9, discusses sixteen of these vessels.)

In addition to the finds of household items/pottery related to cooking, large amounts of animal bones were found in the southern area, providing evidence of the species that were included in the diet (Table 11). As within the northern area, the osteological material was the most frequent material found in all of the three large waste contexts here.

Figure 19. T27074:9, 10 and 11: Whetstones. T27074:101: Bone arrowhead. T27074:49, 51, 52, 53 and 54: Iron rivets. T27074:12 and 295: Bone needle. All finds are from waste layer 500200. Photo: Åge Hojem, NTNU University Museum.

Figure 20. T27074:1, 2, 3 and 4: Silver ring, bronze ring, glass bead, fragment of glass beaker from waste layer 500200. T27078:1: Decorated handle of bone spoon from waste pit 521397. Photo: Åge Hojem, NTNU University Museum.

Figure 21. T27074:6, 102 and 103: Fishing hook, knife, and key from waste layer 500200. Photo: Åge Hojem, NTNU University Museum.

Context id.	Birch bark	Animal bones	Burnt animal bones	Burnt clay	Charcoal	Raw clay	Finds	Fire-cracked stone	Pottery	Sea shells	Slag
500200	x	x	x	x	x		x	x	x	x	x
509677		x			x		x	x	x	x	
521623		x			x		x	x	x	x	
613254				x	x	x	x	x	x		

Table 10. *Observations in waste contexts in the southern area.*

More than 3kg of osteological material, consisting of more than 2000 fragments (NISP), originated from these contexts. The animal bones from all the three large contexts indicate both animal husbandry and fishing, although with some variations regarding species and frequency of species (Karlsson et al. 2018). In addition, the waste contexts related to the Late Roman/Migration period Houses 2 and 15 indicate that hunting took place within this household. The Late Roman waste layer impressively contained fragments of tibia from brown bear (*Ursus*). For more information on the osteology, see Storå et al, Ch. 8. The cockles found in the Migration period waste pit 509677 indicate that some local foraging was a subsistence strategy.

No substantial evidence for household production activities such as metalworking and production of bone items was found within the southern waste contexts. Although the waste contexts here contained some production remnants such as kiln fragments and slag, the number of such items was much smaller than in the northern area. A faint trace of such materials was found within the largest waste layer 500200 (Figure 22), but in quantities too small to interpret with certainty as being remains of actual production in this area.

	521623 *	500200 *	509677 *	Pit 613254 **
NISP	402	925	768	9
Weight (g)	428.01	2239.44	587.55	4.2
Species (interpreted)				
Husbandry	Cattle, goat, horse, pig, sheep/goat	Cattle, horse, pig, sheep, sheep/goat	Cattle, pig, sheep/goat	
Hunting		Brown bear, moose Seal, whale	Whale	
Fishing	Codfish, haddock	Atlantic cod, codfish, common ling, haddock, herring, ling, saithe	Atlantic cod, codfish, common ling, haddock, pollock	Atlantic cod
Bird		Chicken		
Other		Canid, artefact	Rodent	
* Preliminary osteology report field C (Karlsson et al. 2018) ** Final osteology report Field D (Aalders et al. 2017b)				

Table 11. *Osteology within the southern area waste contexts.*

The amount of pottery (94 sherds) found within the large waste layer was significant but no kilns from the Late Roman period were found in this area. However, two kilns were found within, but pre-dating the Early Roman house 34, located 1.5 m east of the layer. These kilns were dated very early within the Early Roman period: 522729 was dated to 38 BC-AD 59 (Tra-13059, 1985+15 BP) and 522089 was of the same age, dated to 45 BC-AD 50 (Tra-13060, 2005±15 BP). It is thus unlikely that these kilns were the source of the pottery within the Late Roman waste layer (Heen-Pettersen & Lorentzen Ch. 6, Solvold Ch. 9). Considering that the entire excavation area contained no Late Roman kilns, it is possible that the pottery within the Late Roman contexts was imported to Vik.

The youngest waste layer 500200 as well as waste pit 509677 shared some similarities regarding finds, although the amount of rivets found in these contexts differed greatly. The similarities are not surprising, considering these contexts were related to the same household. A large quantity of rivets was found within waste layer 500200 as well as five iron knives and an iron fishhook, while 509677 contained a few rivets. However, the lack of slag and waste from metal production during the Late Roman and Migration period indicates that metal items were not produced within the southern area during these periods.

Whale bone was found in both 500200 and 509677. Storå et al. (Ch. 8) suggest that whale bone could be used as raw material for bone craft, and as such, bone items in the form of an arrowhead and some needles in 500200 and a decorated bone spoon from 509677 could have been produced locally. However, the lack of waste from bone production contradicts this view, probably indicating that bone items were imported.

Because of the coarse and stony fill of the waste contexts in field C, micromorphological analyses

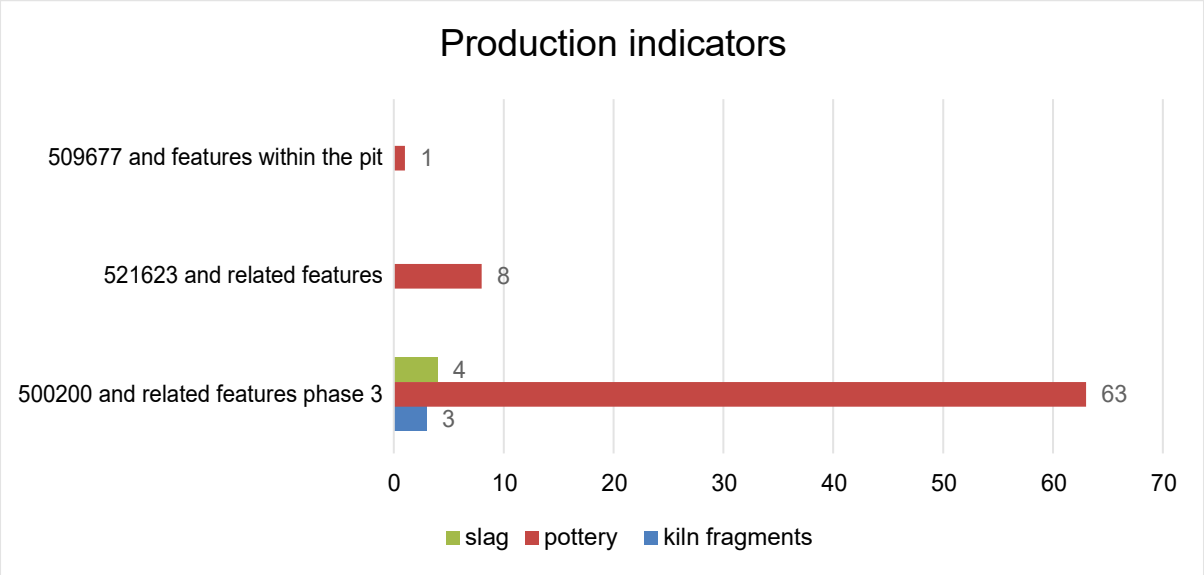

Figure 22. Production indicators in the southern area main waste deposits. Illustration: Marte Mokkelbost, NTNU University Museum.

	500200	521623	509677	613254
Size	88.34m²	27.9m²	2.9m²	2.8m²
Colour	Greyish black	Greyish black	Dark grey	Red, black, grey, dark greyish brown and brownish black
Fill	Gravelly sand with stones (some fire-cracked)	Gravelly sand	Sand, stones (some fire-cracked)	Gravel, charcoal lenses, fire-cracked stones, silt/raw clay
Macrofossils (*)	Rye (Secale cereale), 1 grain; Cerealia indet., 2 grains; cerealia indet. et. fragmenta, 11 fragm.; weeds (Stellaria media, Carex) (*).	Layer 521623: Cerealia indet., 1 grain. Layer 524312: Cerealia indet., 2 grains. Cooking pit id. 524509: oats (Avena), 1 grain; an assortment of weeds (Chenopodium album, Persicaria lapathifolia, Stellaria media, Carex), 1 fragment of hazelnut (Corylus avellana) (*).	Layer 521429: Cerealia indet., 1 grain (*).	Barley (Hordeum vulgare), 1½ grain. Grass (**).
* Buckland et al. 2017. ** Moltsen 2017				

Table 12. *Composition of the largest waste contexts in the southern area.*

were not possible. However, they were all quite similar in colour and fill (tables 10 and 12). The largest layer 500200 was the most diverse, including both birch bark, burnt animal bones, burnt clay and some slag, which were not present in the other two contexts. It also contained a relatively large amount of grains, although only one type of grain was determined. However, this was the only rye found in this field, making this a very interesting find.

One cooking pit 524509 in the small waste layer 521623 contained a variety of plant species, including oats, which seemed to be quite common in Field C, and one rare fragment of hazelnut. In addition, there was an assortment of weeds, perhaps disposed of after weeding had been done. The context could have been a mixed cooking pit and waste context, or the sample could have contained material from two different usage phases (Buckland et al. 2017:71).

Because micromorphological sampling was not possible in waste deposit 500200, the presence or absence of latrine/byre content could not be established. However, the layer was preserved in a large, shallow depression in the ground, like the layers in Field A. It is likely that this depression originated from the repeated removal of midden-like contents designated as fertiliser on nearby fields, thereby implying that fertiliser production took place in Field C too.

Roman Period Activities at Vik: Discussion

The analysis of the northern and southern areas revealed that that many activities on the Roman period farm could be inferred from the waste deposits. They are discussed below, grouped under the broad themes *subsistence*, *production* and *personal life*.

Subsistence

The waste contexts at Ørland provided considerable insight into the Roman period diet, where domesticated animals and sea resources such as fish, sea mammals and cockles were especially important. Wild animals entered the menu occasionally, in the form of both terrestrial and aquatic mammals. Animal bones were deposited after the meat was consumed (see also Storå et al., Ch. 8). Analysed lipids from several vessels revealed that both terrestrial and aquatic foods had been cooked or stored in these vessels (Isaksson 2017, see also Solvold, Ch. 9). Three fragments of an imported glass beaker found in the Late Roman layer 500200 and in a cooking pit 519779, as well as several fragments of small pottery cups/beakers with handles, all from waste deposit 500200 (see Solvold, Ch. 9) serve as reminders that drink also was part of the diet. Analyses of Danish pottery and bronze drinking vessels as well as drinking horns from the Roman period have shown that drink could have consisted of mead, or beer made from grains, herbs, berries and honey (Rødsrud 2010:57).

Within the osteological material, very few toe bones/metapodia from domestic species were present, implying that waste from slaughter was absent among the household waste at Vik. This could indicate that the animals were slaughtered elsewhere (Storå et al., Ch. 8), and/or that slaughter waste was deposited outside the excavation area. One might see this as evidence that animal husbandry was not present at Vik; hence, meat from domestic animals might have been brought in from farms outside Vik. However, coprolite bone – bones that have been digested and defecated – was found within layer 106581, which also contained pig manure (Macphail 2016). This is clear evidence of pig husbandry at Vik, also showing that bones, perhaps as part of slaughter waste, were part of the pigs' diet, though it has not been examined whether these were cooked (food remains) or raw bones (slaughter waste). Furthermore, the presence of manure from other domestic animals in the northern waste layers as well as in the cattle path 130000 in the northern area, and a deposit of an almost complete foal within Longhouse 2 in the south (Heen-Pettersen & Lorentzen, Ch. 6) indicate that domestic animals were raised within the excavation area. It therefore seems likely that domestic animals at Vik were slaughtered at a distance from the settlement, and that slaughter waste was deposited at or near the place of slaughter, while the butchered meat was brought back to the settlement.

It could be argued that slight differences in animal/fish species representation and culling age of domestic animals such as cattle and sheep (see Storå et al., Ch. 8) in the two areas represent different subsistence economies – i.e. specialised economies. I would however argue that the differences are too slight to indicate totally different economies, and I would rather characterise the economy throughout Vik as fishing-farming. The waste contexts all contained bones from various species of fish as well as cockles and other seashells, indicating that marine resources were of great importance for the settlement at Vik. At the same time, animal husbandry was clearly another important aspect of the economy, while ard marks, grains and fertiliser production hint at the existence of arable farming. Granted, there is a difference in culling ages of cattle and sheep from the Early to the Late Roman period (Storå et al., Ch. 8). When it comes to the question as whether wool production or meat production was more important, analysis of the culling age of different types of animals (Storå et al., Ch. 8) indicates that this fluctuated, and it is tempting to conclude that, during the Late Roman period, the northern area might have provided the meat while the southern area focused on wool production. However, both areas still contained other indicators of a fisher-farmer economy, such as substantial evidence of fishing in

the form of several types of fish bone and fishing equipment, together with bones from sea mammals, wild animals and birds as well as of domesticated species such as cattle and sheep (e.g. Bertelsen 2018). There is a slight variation concerning the frequency of fish species within the northern area contexts, especially haddock and common ling (Storå, p. 5-6, and Table 4), but this might have other causes (see the discussion below on feasts).

The deposited material in the waste contexts at Vik bears close resemblance to the assemblage in the previously discussed East Chisenbury midden in Wiltshire, England, in that it contained similar artefacts as well as animal bones and dung. In addition, the hypothesis regarding evidence of sporadic and massive feasting in the East Chisenbury midden (Tubb 2011:47), may also be true of some of the waste deposits in Vik: Meat of horse was handled and consumed on site in both northern and southern areas (Storå et al., Ch. 8). The consumption of horse meat is commonly related to ritual activities, which often take place at special occasions (e.g. Mansrud 2004, Oma 2005). In at least one instance, there is undeniable proof of a single or short-termed incident of massive food consumption at Vik: the large waste pit 210240 in Field E. During the Late Roman period, an enormous quantity of cockles together with large amounts of fish were devoured and later deposited within this waste pit. Haddock was well represented, and since it is commonly regarded as an excellent food fish, this further strengthens the impression of a large feast wherein good food played a central role. Haddock was also plentiful within the southern area in general, but uncommon in waste contexts in Field A. Apart from that, the fish species representation in Field A contexts resembled the other waste contexts at Vik, containing other good food fish such as codfish and saithe. Furthermore, all the large waste deposits contained much pottery, together with large amounts of animal bones, echoing the East Chisenbury assemblage. Thus, it could be argued that the waste context assemblage at Vik contained several indicators of feasts and ritual activities.

Production

Indications of Early Roman pottery production in the northern area (deposit 110297, Field A) existed in the form of kiln fragments, however in the Late Roman period there was no evidence for such production at Vik. The kilns in the southern area predated both the area's Roman period settlement and the waste contexts that included pottery. Pottery production in the Early Roman period therefore took place only in the northern area (Field A). Likewise, only the northern area (again deposit 110297) exhibited evidence of metal working in the form of heavy slag. In the Late Roman period, this pattern was slightly changed – only the northern Field E deposit 210240 displayed evidence of any kind of production, and in this period only of metal working in the form of very light slag, perhaps indicating a farm smithy.

While the metal production remnants in the two northern deposits were frequent compared to the southern deposits (Figures 14 and 20), the collected amounts were relatively small, suggesting production on a small, localized scale. Pottery production remnants, however, were more frequent. It therefore seems that the northern area relied on manufacturing their own iron during the Early Roman period, while at the same time the pottery production might have supplied all farms at Vik. In this period, the southern area probably reaped the benefits of the northern pottery production, while iron products might have been imported from outside Vik. Unfortunately, the number of Early Roman finds in the south was limited, making it hard to come to any firm conclusions about the southern area's practice of pottery and iron acquisition.

No remains of Late Roman kilns were found at Vik, thus indicating that all pottery was imported during this later period. Metalworking in this period took place on a small scale and was related to hammering and welding of iron, based on the light slag usually associated with these types of activities. This production could probably not supply both areas with iron items, indicating that the southern area imported such items.

This analysis suggests that a slight division of labour existed between the two areas, at least during the Early Roman period, where the southern area might have relied on northern production of pottery. In the Late Roman period, this had changed, and production was so small that it probably only supported the northern area, thus not really indicating a division of labour anymore. In this period, the southern area was reliant on imports of both pottery and metals, while the northern area seemed to rely on imports of at least pottery.

Personal life

Personal items such as beads, rings, hairpins and pins/needles from buckles/brooches were found within the larger deposits. Interestingly, together with sherds from a large rimmed vessel and a decorated bucket-shaped vessel (Solvold, Ch. 9), these items bear close resemblance to the assemblage usually found within graves from this era (e.g. Solberg 2000:77), suggesting that Roman period graves could be used to gain insight into the Roman period household.

The deposition of the small personal items within the waste contexts can be interpreted as either intentional or unintentional depositions. The latter requires that there was no knowledge of the original whereabouts of these valuable items before deposition – they might have been lost and then swept off the floor or collected together with regular household refuse to be deposited as waste. Intentional deposition, however, requires knowledge of the deposition. The items could simply have been discarded because they were broken, and for some of them this would seem to be a plausible explanation. However, several of the items were whole and undamaged when excavated. Could it be that these valuables were deposited in the waste deposits for a ritual purpose? The similarity with grave goods is very interesting, considering that grave goods are always intentionally deposited (e.g. Solberg 2000:31, Mokkelbost 2007:21-22), and may have ritual or symbolic connotations - e.g. serve a practical function in the after-life, or serve as material representations of the deceased's status and position (Solberg 200:31). The fact that personal items, similar to grave goods, were found whole and undamaged in the waste layers, can perhaps imply that there were intentional depositions also at Vik. However, most of these items were quite small and probably ended up in the waste layers by chance. Additionally, it is not possible to discern a particular pattern in the deposition of these items. Accordingly, they should probably not be regarded as sacrifices or ritual depositions.

CONCLUSION

Depositional practices at Vik varied according to the type and size of the features. When comparing waste pits with waste layers, it seems that the pits represented episodic events as opposed to the complex and multifaceted waste layers. The small pits reflected similar but fewer activities than the large waste contexts. However, the large pit 210240 reflected the same amount of activities as the layers. It functioned as a receptacle for the remains of a single occurrence of cockle consumption, while at the same time to some extent mirroring other household and production activities.

Context is very important within archaeological interpretation, yet when studying refuse/waste, the provenance of items is often hard to disclose. However, in the case of Vik the farms were dispersed

at regular intervals, spatially congruent with waste deposits. Dating material that corresponded to spatial patterns further helped indicate the origin of the secondary waste, thus making it possible to describe the activities that took place at the different farms at different times.

The waste deposited at Vik originated not only from ordinary household activities such as cooking, food consumption, cleaning, sewing, animal husbandry, everyday metalworking and tool maintenance, but also from specialised production in the form of kilns for firing of pottery. During the Early Roman period, pottery was produced locally in kilns in the northern area. In the Late Roman period, this had changed – no Late Roman kilns were found within the entire excavation area, and pottery seemed to have been imported to Vik as a whole. In the same period, some light metal working took place in the northern area only.

Most of the waste found in the waste contexts at Ørland was secondary refuse from households, originating from residential buildings, byres or cooking pits. However, production waste in the form of kiln fragments found in layer 110297 seems to have been dumped in the actual production area. Some cooking took place in cooking pits within the waste layers themselves.

The amount of waste and number of waste contexts were largest in the Early Roman period, which corresponds with the other activity in this area. In this period, the waste was placed within the central yard. In the Late Roman period, a change appeared regarding the spatial distribution of the waste, which was now placed in the outskirts of, or outside, the central yard. In the transition between these periods, one waste context in Field C was abandoned and sealed before the construction of a new waste layer on the same spot. The same happened to a contemporary house, which was cleaned out and closed (Heen-Pettersen & Lorentzen, Ch. 6). This ritual could have reflected a change in ownership of the farm – a possibility discussed above.

As previously suggested, organic waste was probably discarded regularly to insure sanitary conditions on the farms, while at the same time it was regarded as a resource in this farming community, in the form of fertiliser for the fields.

The osteological and botanical material in the waste contexts yields insight into a large subsistence foundation, where animal husbandry, fishing, foraging, hunting and grain production were important ingredients in a fisher-farmer economy. Domestic animals were slaughtered outside the excavation area, while the meat was cooked and consumed on site, as demonstrated by large amounts of bones and cooking ware in the contexts. Preparation of the food took place inside buildings, but also in cooking pits within and beside the waste layers. Some of the meals must be regarded as feasts, perhaps in relation to the cockle-filled pit 210240 in the northern area. Although layer 500200 in Field C contained the highest number of imported items of all the Roman period waste contexts, these items did not automatically represent an elevated social status of the farm related to this layer. Imported items were few, and the farm itself was characterised as socially equal to its neighbours (Heen-Pettersen & Lorentzen, Ch. 6). Overall, the waste contexts at Vik revealed only minor differences in activities and temporal aspects, contributing to the impression of established, self-sustainable and socially equal farms at Ørland in the Roman period.

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