

Discovering dwellings – A study of Late Mesolithic dwelling practices, contexts and attributes based on evidence from Central Norway

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SUMMARY

This study deals with dwelling site formation processes and site contexts, and terms relating to dwelling types and dwelling attributes. Late Mesolithic evidence recovered during the Ormen Lange project, conducted by the NTNU University Museum in 2003-2004 on the island of Gossen in Central Norway, will provide the backdrop for the discussion. This project documented the remains of at least 14 dwellings and a large number of dwelling related features dated to between 6000 and 4000 cal BC. Based on analyses of several dwelling attributes, the Ormen Lange dwellings are (tentatively) divided into 1) Houses for long term or regularly repeated stays – for double as well as single family units; 2) Houses for repeated short-time stays – for task groups; 3) Non-permanent dwellings for short time occupation; 4) Special-purpose, non-residential shelters.

INTRODUCTION

In Northern Scandinavia, particularly in northernmost Norway, visible remains of Mesolithic dwellings have been known and studied since the 1960's (Fretheim 2017, 29-40). In most parts of Central and Southern Norway, however – as in much of Europe – prehistoric dwelling remains are rarely visible in the modern landscape, and have remained elusive until the last couple of decades. After 2000, the number of documented Mesolithic dwelling features have accumulate rapidly all over the country, mainly through large contract archaeology projects.

The prevailing current research trend regarding Norwegian Mesolithic dwellings seems to be one of enthusiasm, optimism and acceptance, treating dwelling remains as parts of common practices rather than isolated, exceptional phenomena.

I very much share this sentiment. However, the rapidly growing database of documented dwelling features highlights the need for an assessment of representativity, and a clarifications in terms and criteria used in these interpretations. If we want to consider the full probable range of Mesolithic dwelling forms, ambiguous interpretations may be unavoidable (cf. Fretheim et al. 2017). What we can and need to avoid, is ambiguity in the terms and criteria we use when describing and evaluating the features and attributes supporting our dwelling interpretations. This paper focuses on

- Dwelling site formation processes and site contexts
- Terms relating to dwelling types and dwelling attributes

In addition to cultural preferences and levels of technology, variability in archaeological dwelling features may result from different length or frequency of occupations, variation in building materials at hand, site-level variations in topography, soil qualities and climate – as well as the various cultural and natural site formation processes at work during and after the final abandonment of the dwellings (Shiffer 1987). Though I will not venture into the wider phenomenological implications of Tim Ingold's “dwelling perspective” (Ingold 2000), I find his focus on the process of dwelling rather than typologies of final dwelling forms inspiring (see also Glørstad 2010). I use the term “dwelling practices” in a related, but more confined way, with reference to the habits or traditions of use which may affect our reading of the material record, e.g. practices relating to waste management, maintenance, reconstructions

and reoccupations of the dwellings. Perceived dwelling types may be the result of similar use as well as similar ways of building.

I use the term “dwelling” generically, to include houses, huts, tents, windcreens or any other structure that has given protection to the central living areas on the sites (cf. Grøn 1995:12). A “house”, I see as a dwelling intended for long-term occupation or regular reoccupations. It is a permanent dwelling structure, but does not necessarily imply permanent occupation. Houses are designed and constructed to withstand local weather conditions during all seasons, even if they may be occupied only a few weeks each year. With regard to the term “pit house”, I follow the North American convention of reserving this term for the actual house structure, while “housepit” denotes the part of the structure left for archaeological observation (Hayden 1997, 5-6; Mökkönen 2011:19). A pit house, then, is a dwelling whose floor level is dug below the ground surface, while the housepit is the below-ground archaeological feature.

The empirical basis of my study is the evidence of Late Mesolithic (LM) dwellings and dwelling practices documented during the Ormen Lange project, on the island Gossen in Møre og Romsdal county, Central Norway (Bjerck et al. 2008) (Fig. 1). The sites from this period (6500-4000 cal BC) included large, stratigraphically complex settlement areas where multiple activities and long term use had resulted in continuous horizons of overlapping cultural deposits and features, as well as sites where features and artefact concentrations were mainly limited to the floor areas and immediate exteriors of well-defined dwelling remains. There were also LM elements – artifacts and single features – on several other examined sites in the area. In all, the remains of 14 dwellings and four possible dwellings dated to the LM were documented.

Prior to the Ormen Lange excavations in 2003-2004, no certain Mesolithic dwellings had been excavated in Central Norway (the counties of Trøndelag and Møre og Romsdal). The Ormen Lange project provided the possibility of studying the dwellings not only as isolated features, but as parts of larger settlement areas. Diversity may be the most striking characteristic of this dwelling assemblage. Not only do the Ormen Lange dwelling remains come in different shapes and sizes, with different constructional elements preserved – they also appear to result from a variety of formation processes, many of which seem related to maintenance, reconstructions and reuse of dwellings or dwelling plots over time spans of a millennium or more. The implications when we say that a dwelling has been in use for such a long period, or that it has several discontinuous phases, raise interesting questions regarding the coherence of the feature assemblages we refer to as dwellings. Rather than evaluating each suggested Ormen Lange dwelling unit, nine dwelling attributes of general relevance for the interpretation of dwellings and settlements will be discussed in some detail (Table 1).

When dealing with dwelling attributes, we need to differ between constructional elements and features that result from long term and repeated use (clearing, maintenance), or relate to actions and processes from the time of abandonment and onwards (destruction/salvage, natural processes of disintegration and disturbance). This may seem obvious, but is not always easy to accomplish. I have found it useful to consider the features driving our dwelling interpretations with regard to where/when they originate in the sequence of site formation stages:

(Re)Construction → Occupation → Abandonment → Disintegration → Archaeological feature

Reuse of old dwelling features and plots is an increasing trend during the LM in Norway (Fretheim 2017, 214-215), and is a common practice among many modern-day foragers

(Steensby 1910; Cribb 1991, 84-112; Orquera and Piana 1999). Rather than seeing signs of repeated reuse as obstacles to our dwelling interpretations, we should recognize such practices as culturally significant, as we do with trends involving more solid buildings or increasing dwelling sizes.

EXCAVATION STRATEGIES AND LM DWELLING SITE

CONTEXTS AT ORMEN LANGE

Together with the Melkøya project in Northern Norway in 2001-2002 (Hesjedal, Ramstad and Niemi 2009) and the Svinesund project in Eastern Norway in 2000-2004 (Glørstad (ed.) 2004), the Ormen Lange project contributed to setting new methodological standards in Norwegian Stone Age excavations, by applying large scale mechanical uncovering of the site areas. At Ormen Lange, the combined estimated area of all the Stone Age sites based on survey data was c. 6820 m², while the uncovered area during excavation amounted to c. 26,790 m² (cf. Bjerck (ed.) et al 2008, 53). A lot of time was allocated to the clearance, studying and documenting of site surfaces before the onset of the proper excavations. The observations at this stage provided essential overviews of site layouts, and detection of several features that turned out to be the remains of dwellings. The size of the exposed surfaces was an important factor, as both mounds, pits, floor fills and concentrations of surface artefacts were often hard to identify without having the contrast of the larger, “empty” surroundings (Bjerck (ed.) et al 2008, 60).

Areas chosen for further examination were generally excavated in mechanical units (0.5x0.5 m, 5 cm layers), to develop comparable records of artefact distributions. However, well-defined stratigraphical units were dug separately, and at some of the most stratigraphically

complex site areas, a combination of single context recording and documentation through sections was used (Fig. 2).

Opportunities for discovering and interpreting dwelling remains depends on site context. Conditions for preservation will vary – sometimes at a very local level. Natural and cultural site transformations both play their part. In the following, the site contexts of the LM Ormen Lange dwelling remains will be presented and discussed.

THE "CULTURAL LAYER SITE" SITUATION

In the widest sense, a culture layer may be any form of preserved feature or deposit caused by human activity. In Norwegian Stone Age archaeology, the term is often reserved for accumulated deposits in the form of blackish, viscous or "fatty" matrixes of heavily decomposed organic materials, sand, soot, charcoal, lithics, fragments of bones (mostly burnt) and firecracked stones (c.f. Bergsvik 2002:14). Though seldom defined, a "cultural layer site" (Norwegian: kulturlagslokalitet) is typically understood as an open air Stone Age site where such cultural layers extend beyond single features (housepits, fireplaces, refuse pits etc.), to form continuous horizons of depositions. The oldest dates from Norwegian culture layer sites of this kind belong to the Middle Mesolithic, but most of them seem to have been established during the Late Mesolithic or Early Neolithic (Olsen 1992; Bergsvik 2002; Bjerck 2007; Åstveit 2008a). They are a coastal phenomenon, and rarely encountered east of the Agder counties or north of Nordland. Cultural layer sites are often interpreted as base camps, representing long term use and a wide spectrum of activities. While their chronological distribution seems to reflect actual trends in settlement structures (Bergsvik 2001; 2002; Bjerck 2007), the implications of their geographical distribution are less clear. Their near absence in eastern and northernmost Norway may, at least partly, relate to regional variations in the post-glacial shoreline displacement. Along the coast of Western and Central Norway,

settlement sites could stay shore bound and attractive to marine foragers throughout the nearly 3000 years' relative sea level stability following the Holocene (Tapes) transgression (c. 7000-4000 cal BC). In the coastal areas of Eastern and most of Northern Norway, isostatic uplift was more pronounced (cf. <http://geo.phys.uit.no/sealev/index.html>), and although the rate of the shoreline displacement slowed down, there was a limit to the number of generations who would find the same spot ideal for long-term occupation. Thus, cultural layers would have had less time to build up, and would more easily be lost to eluviation and other processes of natural disintegration. Regional differences in preservation conditions are also a likely factor. At the Eastern Norwegian Middle Mesolithic sites at Tørkop (Mikkelsen, Ballin and Hufthammer 1999) and Hovland 3 (Solheim and Olsen 2013), several mechanical layers containing numerous artefacts (to a depth of 70 cm in the Tørkop case) had to be removed before distinct cultural layers in housepits were identifiable – giving reason to believe that substantial amounts of shallower features and organic matter had been lost at these sites.

The long time-spans, abundant artefact assemblages and dateable stratigraphical contexts which characterize the culture layer sites have made them an excellent basis for chronological studies of Western Norwegian Stone Age artefacts (e.g. Olsen 1992, Bergsvik 2002). Their potential for intra-site spatial analysis, however, has been questioned (Olsen 1992:21). To some degree, the excavations of the LM culture layer sites 29 and 30 at Ormen Lange confirmed the problems of isolating synchronous features within the culture layer, and relating patterns in the lithic distribution to specific features or activity areas. The combined culture layers at culture layer sites will typically act like a "black box", where features and patterns are easily discernible at the top and bottom interface, while the stratigraphic contexts and relationships within the culture layer matrix often remain obscure (Johansen 2005). As with later period settlement sites uncovered beneath the modern day farming landscape, the

features revealed at the bottom level are mostly in the form of various cuts (pits, postholes, ditches etc.), which may belong to a wide range of chronological contexts.

Ormen Lange Site 29 and 30 were both situated on the west side of the Nyhamna bay, right on the sea shore within the period 7000-4500 cal BC (Fig. 3). The 0.5-1.5 m thick peat layer covering the sites was removed by mechanical diggers, opening up a total area of c. 6850 m². The continuous cultural layer area of Site 30 covered 1500 m², of which 657 m² was excavated. The combined thickness of the layers was c. 50 cm in the central areas of the site. A total of 365 individual features and more than 90,000 artefacts were recorded. The features and finds on the site were mainly from the LM, the initial phase starting around 6000 cal BC. The upper 10-15 cm of the cultural layer horizon, however, represented both LM and Neolithic deposits disturbed by Late Neolithic and Bronze Age cultivation activity (Skår and Bakke-Alisøy 2006; Åstveit 2008b). Beneath this mixed cultivation layer were a series of more horizontally restricted cultural deposits and features. Four groups of features on Site 30 have been interpreted as remains of LM dwellings (Table 2: 30A, C, E, F), and four as latent/possible remains of dwellings (Table 2: 30B, D, G, H). The large number of remaining construction-related features (postholes, ditches, possible wall mounds etc.) suggests that the number of built structures actually made and used within the site area during the LM was considerably larger.

(Fig. 4)

At Site 29, only about 45 m² of the c. 270 m² area containing cultural deposits were excavated fully. The combined thickness of the layers was c. 40 cm in central areas of the site. The upper cultural layer horizon here was not disturbed by subsequent cultivation. The many preserved features identified directly beneath the thick peat cover, including the remains of at

least one light dwelling, were all dated to the Neolithic or later, and will not be discussed further here. Seven postholes, five of them forming a single row, were identified at the bottom level. They may belong to the earliest, most extensive period of use, c. 6800-6400 cal BC. Had the entire extent of the bottom layer been exposed, it is quite probable that more Mesolithic features would have been identified.

SITES WITH WELL-HIDDEN BUT WELL-DEFINED DWELLING REMAINS

Three sites with LM dwelling remains were documented southeast of the Nyhamna bay, across from Site 29 and 30, at about the same elevation (Fig. 3, Site 50, 68 and 69). Here, too, the site surfaces were covered by a thick peat layer, but there were no extensive horizons of cultural deposits or finds underneath. In the survey of the Site 68 area, two positive test pits gave a total of 17 non-diagnostic lithics, and no indications of preserved cultural deposits or features (Åstveit 2008c). Had excavation resources been more limited, the entire site might easily have been dismissed without further examination. Site 69, too, was only recognized as a proper settlement site after intensive test trenching by mechanical digger at the initial stage of the excavation (Jørgensen 2008). Site 50, 68 and 69 were all included in an uncovered area of c. 3850 m².

Site 50 contained two distinct housepits surrounded by wall mounds (50A-B), as well as various pits, ditches, fireplaces and postholes in the area between them. Though the majority of the features and the c. 19,000 collected lithics were of Mesolithic origin (c. 6000-4700 cal BC), bone fragments of a 2-4 year human child in a context believed to represent a grave was dated to the Late Neolithic (Åstveit 2008d).

(Fig. 5)

Site 68 contained the remains of at least five dwellings – or seven, if the multiphased remains from the most complex dwelling plot are counted as separate, superimposed dwelling structures, as in the following (Table 2: Dwelling 68A1-3). Most of the lithics came from the cultural deposits associated with the dwellings and a midden area east of the dwellings 68B and 68D. Documented features not included in any of the dwelling interpretations were few, but included a large and well-structured fireplace beneath the wall mound of dwelling 68D.

Site 69 contained a single housepit (69A, Table 2), and was apparently the least complex of the LM Ormen Lange settlement sites, though it had been in use both in the LM (c. 5300-4800 cal BC) and the Early Neolithic (c. 4800 cal BC). Features apart from the documented housepit included a large pit filled with cultural deposits – possibly a second housepit southeast of 69A, which could unfortunately not be examined sufficiently within the limits of the excavation (Jørgensen 2008, 430).

ATTRIBUTES OF THE LM DWELLINGS

Most of the documented LM dwellings from the Ormen Lange project were recognized and named as structural units during the excavations. Others were recognized as units, but not given names as such in the original documentation. For present purposes, I have found it necessary to rename the units interpreted as dwellings, so they can be referred to and discussed more easily. Both new and original names are listed in **Table 2**. Simplified plan drawings of the dwelling remains are provided in **Fig. 6**. These are all based on data from the published Ormen Lange report (Bjerck (ed.) et al. 2008), as are the descriptions and interpretations presented in Table 2. For the discussions of individual dwelling interpretations, I refer to this report.

Fig. 7 shows calibrated spans for ¹⁴C-dates related to each of the LM Ormen Lange dwelling units (2σ, IntCal13). Darker shades indicate overlapping dates (all uncal dates and lab references can be found in Bjerck et al. 2008 and Fretheim 2017, Appendix 3). Several of the Ormen Lange dwelling units (30A, 50A, 50B, 68A (1-3), 68D and 69A) show possible spans of more than a millennium between oldest and youngest date seen in relation to occupations.

SIZE, SHAPE AND MODIFICATION OF FLOOR AREAS

Estimated floor sizes of the documented LM Ormen Lange dwellings vary between 6 and 27 m². Only three floors fall between 11 and 25 m². Four are larger, seven are smaller. Fig. 8 presents a comparison of the Ormen Lange floor sizes and shapes compared to other excavated and well dated Norwegian Mesolithic dwellings. The apparent gap between small and large dwellings that show up in MM2-LM3 (7500-5000 cal BC) is discussed further in Fretheim 2017, Chapter 5. The mean size of the four larger Ormen Lange dwellings (25.8 m²) is three times the size of the mean for the seven smaller (8.4 m²).

Fig. 8 also shows the (approximate) *shapes* of the Ormen Lange dwelling floors and other documented Mesolithic dwelling floors in Norway. The only rectangular or quadratic Ormen Lange dwellings are larger than 25 m². The others are interpreted as oval (slightly elongated) or circular. One of the largest dwellings, 68D, was clearly circular. There is no obvious chronological pattern to the distribution of Ormen Lange floor shapes within the LM. In a Norwegian context, LM floor shapes appear to vary more with region than with age (Fretheim 2017, Chapter 5).

In total, eight LM Ormen Lange dwellings can be characterized as pit houses, with the bottom of the floor level clearly lower than the contemporary site surface ("possible dwellings" are not part of this count). The average maximum depth is 28 cm, and the range is 20-40 cm. Two

floors, both larger than 25 m², were clearly not sunken. This includes dwelling 68A2, established on top of the floor fill of the 68A1 housepit. The remaining four dwellings were possibly or slightly sunken (<20 cm). This fits well with the overall pattern for documented LM housepits in Norway (Fretheim 2017, Chapter 5). Most of these are fairly equal in depth, ranging between c. 10 and 40 cm, with nearly half of them c. 10-20 cm. The most obvious exceptions are some of the LM housepits from interior Eastern Norway, with depths of c. 100 cm (Boaz 1999).

An interesting characteristic of the Ormen Lange housepits, as well as with Mesolithic housepits in general, is that most of them seem to have been filled up with cultural deposits through long term use or regular reuse, meaning that, eventually, the floors would be level with the outside surface. Three of the dwellings had extensive layers/packings of cobblestones added to the no-longer-sunken floor level at later occupational stages (50A, 68A2/3, 68D). It is hard to say if these represent independent solutions to immediate needs (e.g. for a more stable, less muddy floor or work space), or if they represent a form of cultural trend. In any event, it shows that people actively chose to re-inhabit or keep on using old dwellings or dwelling plots even when a functional housepit was no longer present.

WALL MOUNDS

The term “wall mound” (Norwegian: veggvoll) is regularly used in descriptions of Norwegian archaeological dwelling remains. It draws attention to the surface appearances of these features – not their functions or the processes that have formed them. The term “tuft” (from Old Norse “topt”, same as Old English “toft”) has similar issues, as it usually denotes dwelling remains with visibly raised wall features, often (but not necessarily) surrounding housepits.

Wall mounds will typically result from one or more of the four scenarios described and illustrated in Fig. 9. All drawings represent the mounds as we would find them today.

Only in scenario A do the mounds originate as mounds. In scenarios B and C, the mound shapes are essentially by-products of other processes. In B, they originate with the construction stage, but do not necessarily have a function relating to the construction. In C, they originate with the occupational stage, or possibly with construction stages of new dwellings reusing old dwelling floors. In D, the mound is the result of post-occupational processes – active demolition, natural processes of decay, or both. As mounds, they originate with the abandonment or post-occupational stage.

Fig. 9, however, shows the mound formations in their idealized forms, devoid of complexity.

In the "real life" of dwellings and dwelling remains, the appearance, compositions and functions of features that lead to the wall mound category may have shifted over time (Fig. 10). For instance, it seems reasonable to interpret mounds of cultural deposits surrounding a floor area as a combination of the A and C (and possibly B) scenarios, rather than simply C.

Why make household debris build up evenly along the wall area unless the middens were intended to serve a purpose, such as inhibiting draft or supporting the superstructure in some way? Why not just dump it outside the entrance area? Of course, the entrance may have been shifted about; there may have been more than one entrance; the superstructure may have been light enough simply to have been removed between each clearing of the floor. Still, a solid mound of midden material surrounding a floor area in use would arguably represent a functional feature, even if the built-up form may have been unintentional at the beginning.

Mounds or collapsed wall remains of any kind are likely to have been reused in the same way, as wall supports or sheltering features for new dwellings.

Despite these complications, I believe clues to the wall mound interpretations may be found in their compositions. In my quantitative examination of Norwegian Mesolithic dwelling attributes (Fretheim 2017, Chapter 5), I have included the variable "mound composition", with five values:

- 1) The composition of the [wall] mounds is similar to the natural subsoil on the site
- 2) The mounds contain markedly more humus/turf than the surrounding subsoil
- 3) The mounds contain markedly more stones than the surrounding subsoil
- 4) The mounds contain midden material (lithics, fire cracked stones, burnt bones, charcoal etc.) but are mainly sand/stones/humus etc.
- 5) The mounds are largely composed of midden material

Of course, a wall mound found on a cobblestone beach may have the same composition as the beach, and still be the remains of a dry stone wall (D in Fig. 9). Apart from that, I would suggest that value 1 indicates built or excess soil mounds (A or B in Fig. 9), while the values 2 and 3 indicate wall remains or foundations (D). Value 4 may indicate maintenance or reuse of a dwelling with any kind of wall mound. Value 5 may, of course, indicate that the mounds are accumulated household middens (C). However, they could also be built or excess soil mounds made of cultural deposits from previous site activities.

Seven of the Ormen Lange dwellings had wall mounds surrounding most of the floor area, all of them along the exposed Mesolithic beach terrace southeast of the Nyhamna bay (Site 50, 68 and 69, Fig. 3). **Table 3** presents the "mound composition values" for each dwelling.

Though few, the wall mounds seem to represent a variety of purposes and/or formation processes. Three mounds include more stones than the surrounding subsoil, but only one is interpreted as the likely remains of dry stone walls (68A2). Two wall mounds contained more

humus/turf than the surrounding subsoil (50B, 69A), and may have had turf as part of the wall or wall cover. Three wall mounds contained significant levels of cultural deposits. In 68A3, the mounds were nearly *all* cultural deposits. As this dwelling was built on top of 68A2, the most likely explanation is that they were made during the construction phase – using the older floor filling – rather than having accumulated during the occupational phase. The same may be the case with the 50B wall mound. There was no fill of cultural deposits in the floor area of this dwelling. Two dates from the mound deposits gave 5960–5640 and 5445–5345 BC cal BC. In the published Ormen Lange report, these dates are not suggested to represent the building or occupation phase of the dwelling, as the time span between them is considered too long for a dwelling without a floor fill, or more distinct features in the floor area (Åstveit 2008d, 279-280). Instead, the dates are seen in connection with an occupation phase predating the dwelling. The question is whether this phase represented a restricted open air activity area with cultural deposits, or an older floor fill/dwelling phase. I am inclined to believe the latter, as Site 50 was not a “cultural layer site” in the same sense as Site 30. Except for an up to 10 cm thick, c. 36 m² culture layer horizon outside Dwelling 50B (S 13, Torvin 2005), the cultural layers on the site seem to have been limited to distinct features. Also, the features interpreted as middens to the northwest and southeast of the 50A wall mound seem related to occupation of the same spot, and a date from one of them overlaps the oldest date from the wall mound deposits (5710–5530 cal BC). In dwelling 69A, the cultural deposits in the mounds may have resulted from a combination of clearing of the floor during occupation and a late stage (Neolithic) construction phase (Jørgensen 2008). Dwelling 50A had one of the most distinct wall mounds in terms of shape (Fig. 11), and was the only mound whose composition differed minimally from the natural subsoil of the site.

POSTHOLES

I use “posthole” as a generic term in the following, including all but the very small stakeholes documented along the wall ditches of dwellings, e.g. dwelling 30E (see section on wall ditches below). Postholes are associated with the wall areas of at least nine of the Ormen Lange dwellings (Table 2 and Fig. 6). A few of the documented cut sections gave clear indications of the angle of the posts, e.g. some of the fairly narrow (10-15 cm), stone lined post-holes related to the dwellings 30A and 68D, which seem to have supported vertical posts. It has been suggested that these particular dwelling structures may have been dome shaped (Åstveit 2008a, 581-582. See however Åstveit 2010 for a different view). Domed dwellings in ethnographic contexts are usually formed with a frame of arched or bent poles set vertically into the ground. Some of the wall postholes associated with the 68A dwellings/phases seem to have supported posts slanting towards the floor center – compatible with ridged or peaked constructions – but most were undetermined. Of course, slanting wall post may also be secured simply by providing something that hinders them from sliding outwards from the center – a mound, large stones, the sides of wide pits or ditches etc. Or the superstructure, including covering, may be solid and heavy enough to make the whole thing self-supporting (pers. comm. Jurgen Wegter and Per Olav Mathiesen).

Postholes within the floor areas were detected in half the dwellings, but their placement and sizes do not suggest conformity in construction details. Some of the detected inside posts may have belonged to internal furnishings rather than the actual dwelling construction. Dwelling 50A stands out, with a construction that seem to have involved a single, roof supporting central post (Fig. 7). This post was replaced at least once during the period of occupation (Table 2).

Two areas at Ormen Lange stood out in terms of density and number of documented LM postholes: The 68A plot at Site 68 and the area containing the dwellings 30A-D at Site 30 (Fig. 12). I will discuss these further, in order to address some specific problems with relating postholes to dwelling constructions.

In both areas, most of the posthole features could only be observed in plan at the level beneath the cultural deposits, against the natural subsoil. The cut fills were consistently indistinguishable from the superimposed layers. All dated charcoal samples from the posthole fillings (four from Site 30, five from Site 68) returned LM dates, but dating of postholes is notoriously difficult when nothing but the cut remains, and the level the cut was made from cannot be spotted. In order to make sense of the seeming clutter of postholes in certain areas, the spatial distribution of the postholes in relation to other documented features had to be carefully considered.

The main methodological approach to the recording of dwelling 68A was single context excavation (Johansen 2005). However, the "black box effect" of the cultural deposits within the dwelling plot meant that the actual stratigraphic relationships between postholes were hard to detect. In a few postholes, documented in sections, stone-packing could be observed from the top of the cultural deposits and nearly all the way down to associated cuts in the subsoil. Comparing of multi-context plan drawings of different levels showed that some of the small stone packings that were only visible on the surface of the cultural deposits appeared to match truncated postholes at the bottom level. Similarly, truncated postholes observed at the bottom level were in some cases matched with noticeable openings in the late phase cobblestone floor. Still, the majority of the postholes could only be sorted to specific phases or constructions based on how well they seemed to fit the interpretations of the different dwelling plans. In Fig. 12, we see that at least some of the older (black) postholes follows the

north-east outline of the bottom house pit (black solid line) very convincingly. However, it must be pointed out that some of the larger "postholes" along this outline may also represent voids left by the removal of stones (Fig. 12, lower left) – perhaps stones that had a function associated with the walls of the oldest dwelling phase (68A1), moved and reused in the construction of dwelling 68A2. Most of the blue postholes in Fig. 12 have not been related to specific phases. Many appear to follow the south and east wall areas of both 68A2 and 68A3. Still, the most apparent conclusion to be drawn is that the postholes represent a large number of more or less overlapping constructions/reconstructions – many more than can simply be attributed to three distinct stages of construction.

On site 30, the possibility of matching post-features from the top to the bottom of the cultural deposits was obstructed by the Neolithic/Bronze Age cultivation activities. Postholes were documented either in sections or at the bottom level. The rows and straight angles formed by documented postholes in the 30A-D area are striking when the postholes are seen isolated (Fig. 12). However, there is reason to suspect that this pattern has more to do with excavation methods than past structures. All the red dotted lines in Fig. 12 mark sections, from various trenches and a pump hole dug in order to keep the central part of the site from flooding. A conspicuous number of documented postholes follow the section lines, revealing that postholes were more easily observed in sections than in plan.

WALL DITCHES

Like wall mounds, ditches surrounding the floor area of dwellings may result from a variety of processes or purposes (related to construction, drainage, representing the roof drip zone etc.). Unlike wall mounds, wall ditches are rarely observed in Scandinavian Mesolithic dwellings (Hernek 2005, 71-77; Fretheim 2017, Chapter 5). Dwelling 30E (Table 2 and Fig. 7) is the only Ormen Lange dwelling whose interpretation rests mainly on the presence of

wall ditches (Fig. 7, S1034 and S1067). The feature S1034 (Fig. 13) was a remarkably straight and even-sided, narrow ditch with a nearly right-angled bend at one end. The fill was charcoal mixed with occasional fragments of bone and charred hazelnut shells. No obvious post- or stake holes were documented at the bottom. The excavation of S1067, on the other hand, revealed a row of stake holes along the sides and bottom, possibly suggesting a form of lattice wall structure made from interlacing branches. A third feature, to the south of S1034, was also interpreted as (part of) a possible wall ditch, with a single posthole (S1038a/b). Table 2 presents the interpretation of the dwelling 30E (“Fredlyhuset”) as in the published report (Åstveit 2008b). Though fairly convincing, it is not the only possible reading of the many features of this area. Fig. 14 presents an alternative interpretation. Here, the narrow, curving part of S1062 is paired with the similarly curved S1038, and a circular hut or tent floor with a diameter of 5.5 m (c. 24 m²) is suggested. The layer S1045 – with a concentration of pebbles – seems to have been restricted by the S1067 section of the wall. Layer S1029, on the other hand – black, fatty and packed with bone fragments – crosses S1067, but seems restricted by ditch S1034. The ¹⁴C-dates also suggest that layer S1029 and wall ditch S1034 may have been contemporary, while wall ditch S1067 is slightly older. Layer S1029 contained large amounts of disintegrated bone material which looked white when first uncovered, but turned a vivid blue when exposed to air (Fig. 15). This phenomenon is caused by oxidation of the hydrated iron phosphate mineral vivianite, whose crystals are often found inside fossil shells, or attached to fossil bone. As one of the conditions for vivianite formation is limited exposure to oxygen (Åstveit 2008b:127), layer S1029 was probably deposited quickly – possibly during a single event. Vivianite was not observed in either of the two obvious housepits on Site 30 (30A and 30F). It seems reasonable that rapid depositions of large amounts of bone debris (and possibly other discarded animal remains) were not desirable inside a dwelling meant for occupation. Thus, I suggest that the wall ditch S1034 represents a dwelling that was not meant

for occupation. It may have been a lean-to, or even just a wind-screen erected as a shelter for a specific activity.

Most likely, hundreds of such “special-purpose shelters” would have been erected during the Mesolithic occupation of Site 30. Most of them would have left few or no observable traces, but the complex of unaccounted-for postholes and ditches between the dwellings 30A-E (Fig. 6), may be another part of this picture. The seemingly long, parallel ditches running through this area (S22a-d, S26/S53) turned out to be several ditches with various characteristics, and largely unknown purposes. Only the trench S 20, along the west side of the 30B floor area, seemed to indicate a wall or wind screen, possibly with narrow-spaced posts (Skår and Bakke-Alisøy 2006, 66). Of course, a variety of non-dwelling constructions (racks, platforms, storage contraptions, cooking device arrangements etc.) will also typically be present at a basecamp or long-term hunter-gatherer camp (cf. Anderson 2006).

A possible wall ditch was also documented on Site 50, located between the dwellings 50A and 50B (Åstveit 2008d, 274-275). The ditch had stake holes along the bottom (diameter 5-7 cm, depth 5-12 cm), was c. 2.2 m long and 0.8 m wide, and curved slightly. The ditch fill was dated to 5660–5525 cal BC, and two of the stake hole fills to c. 5950-5950 cal BC (ibid.).

This feature, too, may represent the remains of a light dwelling or maybe a wind-screen for an out-door activity area.

At Site 68, the only features interpreted as wall ditches were associated with the 68A dwelling plot. A series of ditches or elongated pits may represent a building phase between the dwellings 68A1 and 68A2, or possibly preparations for the construction of the 68A2 walls.

One stone filled ditch in particular (K-309, Johansen 2005), referred to both as wall ditch and

wall foundation, was located beneath the western wall mound of 68A2 (3 m long, 1.6 m wide and c. 25 cm deep).

INTERNAL FIREPLACES

Indoor fires provided not only heat for personal comfort, but light for indoor tasks, and heat for drying clothes and equipment soaked by rain/snow and sea spray. The importance of staying or getting dry cannot be overrated. The LM roughly coincides with the Atlantic Period (c. 6800-3800 cal BC), which was generally warmer than both the preceding and succeeding periods, but also moister, more oceanic. Adaptations to cool, highly oceanic climates may take different forms from those of terrestrial, inland hunter-gatherers, which make up most of our ethnographic reference frame (cf. Breivik et al. 2016). The Yamana marine foragers of subpolar, oceanic Tierra del Fuego were noted for their lack of “proper” clothing, despite harsh weather conditions. The name "Tierra del Fuego" (land of fire) is based on their many fires in both huts and canoes, seen by passing European explorers. It appears that their near nakedness was a practical choice. Frequent rain- or snowfalls and long hours in canoes would have made fitted and covering clothes constantly wet, cold and unpleasant. Animal grease rubbed on naked skin and the constantly available fires took the place of clothes (Orquera and Piana 1999, 297-304). Though we cannot use this single example to suggest a similar practice among the marine foragers of LM Norway, we must assume that staying or getting dry must have been a major motivator behind the building of dwellings as well as the use of fire.

The presence of burnt flint, soot, charcoal and /or fire-cracked stones in floor fillings suggest that fires were used at some point in nearly all of the Ormen Lange dwellings – with the possible exception of 68A3, 68B and 68E.

Two dwellings, 30A and 68D, had centrally placed hearths with foundations of fairly large flagstones (Fig. 4 and 16). Both of these dwellings also had narrow ditches running through the wall area. In the 68D case, two ditches clearly lead towards the fireplace and it is reasonable to assume that they represented air channels for ventilating the fire (Åstveit 2009, 419). In the 30A case, the interpretation is less obvious. Fireplace ventilation is one possibility. Drainage is another (Åstveit 2008b, 147). A need for air channels to ventilate the fire suggests the presence of solid/dense superstructures, perhaps in dwellings meant for winter occupation (Åstveit 2008c, 416). Similar ditches running out from or into the floor areas were also found in the dwellings 30F and 68C.

The only other dwelling with a preserved, fairly distinct internal fireplace was 50A. This fireplace was discovered in a section cut through the massive stone packing added to the floor area during a late occupational phase, and was in the form of a small, charcoal-filled pit without stones. The superimposed stone packing is probably the reason why this fireplace was preserved, and not cleared away or trampled and dispersed in the floor filling during later occupation. In all likelihood, innumerable small internal fires for immediate needs would have been in use in the dwellings that show signs of long term or repeated occupations.

LITHIC DISTRIBUTION

The quantity and distribution of lithics in relation to LM dwellings is often an important element in their interpretations (Fretheim 2017, Chapter 5). However, detailed analysis of lithic scatters may be more fruitful in interpretations of short term occupation units – such as on the Early Mesolithic Ormen Lange Site 48 (cf. Bjerck 2008a) – than when dealing with the palimpsest situations of many LM settlement sites. Table 4 presents the general distribution patterns associated with both certain and possible LM dwelling floors at the Ormen Lange project.

The total lithics distribution of Site 30 was clearly disturbed by the Late Neolithic and Bronze Age cultivation activity (Åstveit 2008b, 132), but four of the main concentrations appearing beneath the top 5 cm layer seemed related to floor areas or possible floor areas (Fig. 17). A fifth marked concentration in the southwest part of the site was not associated with any documented dwelling features, but remained distinct through all mechanical layers from c. 10-40 cm beneath the peat bottom (layer B3-B7), suggesting that the lithics were deposited in a shallow, circular, c. 3 m diameter pit, which may also represent a housepit.

Even excluding uncertain floors at Ormen Lange, lithics concentrations covering and delimiting the floor area appear to be most common, together with distributions suggesting some degree of clearing of the floor area, either in the form of concentrations in/by the perceived entrance area or along the walls. Of course, there is a risk of circular reasoning when suggesting that lithics concentrations typically outline floor areas or appear by the entrances, when our interpretations of floors and entrances may in turn rest on the lithics distribution. However, concentrations of lithics coincide with suggested entrance areas, as indicated by openings in wall mounds in five of the Ormen Lange cases (50A, 50B, 68A2, 68A3, 69A). Similarly, the floor outline interpretations of the dwellings 30A, 30F, 68D and 68E rest mainly on features such as housepits, wall mounds, wall ditches, postholes etc.

Though a lot of time was spent exploring distributions of various artefact types after excavation, few zones for specific indoor activities have been suggested. An exception is 69A, where it was suggested that the inner part of the floor may have been kept free of lithics because it was used as a sleeping zone (Jørgensen 2008, 433) (Fig. 18). I have not prioritized further analysis of internal activity zones. In dwellings with substantial floor fillings, my impression is that distributions reflecting the spatial organization of the dwellings were consistently disturbed by practices of reuse. This may, in turn, indicate a degree of

discontinuity in the use of the dwellings, even in cases with no other signs of periodic abandonment.

EXTERIOR FEATURES

A noticeable occurrence during excavations of LM cultural layer sites are the many generally undefinable pits which turn up in the settlement areas. Depending on size and fill, they are sometimes interpreted as refuse pits, sometimes as sunken fireplaces/cooking pits and sometimes even as possible housepits. At Ormen Lange Site 30, they often contained concentrations of charcoal, fire cracked stones and/or bone fragments (Åstveit 2008b, 162). Similar pits are commonly found on Maglemosian sites in Southern Scandinavia (c. 9000-6000 cal BC), where they tend to appear along with dwelling remains – in some cases encircling the dwelling or central settlement area (Casati and Sørensen 2006, 257-258). Irrespective of individual interpretations, it seems appropriate to interpret aggregations of such pits as indicators of long term site occupation, and perhaps as secondary evidence of dwellings (ibid.). Though I have focused on dwelling remains and features directly related to dwellings, people did not live in their 6-27 m² dwellings the way we live in our spacious, multifunctional homes. For modern-day hunter-gatherers, most of life goes on around dwellings rather than in them (Ingold 2000, 180). We must assume that this was also the case for the LM Norwegian foragers, and that dwelling practices may be inferred from accumulations of various exterior features as well as the traces of the actual buildings.

THE LM ORMEN LANGE DWELLINGS - CONCLUSIONS

It is possible to group the majority of the LM Ormen Lange dwellings based on certain common attributes. Most of the dwellings appear to be oval or circular, and fairly small (less than 20 m²), with slightly sunken floors (10-40 cm). Surrounding mounds and postholes are

often associated with the wall areas. Lithics and other cultural deposits are typically concentrated in the floor areas and/or by the single entrance. Still, the number of dwelling remains without one or more of these main characteristics is significant enough to advise against an "attributes checklist" when evaluating or looking for remains of other dwellings from this area and/or period. Rather than arranging or defining the dwellings based on morphological traits or constructional elements, I have attempted to group them based on the dwelling or settlement practises they appear to represent:

Houses for long term or regularly repeated occupations. Seven of the Ormen Lange dwellings (30A, 30F, 50A, 68A1-2, 68D and 69A) were arguably used for long term or regularly repeated occupation. They are of varying sizes, with the three largest floors (68A1-2, 68D: 25.0-25.9 m²) about three times the size of the four smallest (30A, 30F, 50A, 69A: 8.2-10.5 m²). The smallest houses are close in size to the known dwelling (tent) floors of the Early Mesolithic (Fig. 8). If we assume that these dwellings were meant for small, single family units, the larger LM houses were probably for larger groups, perhaps for two or three family units living together, or household constellations based on other types of social units? Ole Grøn (1990) suggests two main patterns of spatial organization in dwellings of the Maglemose culture – for single or double family units respectively. He also observes a tendency for the smaller, single dwelling units to be older than the larger units (preboreal vs. boreal). A similar pattern and development has been suggested for dwellings in the Mesolithic and Early Neolithic of northern Sweden (Vogel 2010). So far, we have no clear evidence from Norwegian Mesolithic dwellings of the double fireplaces and bimodal lithic scatters that accompany these interpretations, and no clear indication that larger dwellings replace smaller ones over time (Fretheim 2017, Chapter 5). More detailed artefact studies, including re-fitting

and use-wear analysis, might help determine whether differences in indoor activities or spatial organisation are reflected in the large vs. the small house units.

Houses for short-time occupations. None of the mid-sized dwelling remains result from long-term stays, judging by their limited accumulation of floor deposits (50B, 68A3, 68C).

Interestingly, they all appear to be remains of fairly sturdy dwelling constructions, representing a lasting investment at a specific location. Thus, they are arguably houses, by my definition – perhaps for task groups rather than family units. The adjacent dwellings 68A3 and 68C appear to be contemporary. If this is the case, they may both represent the final occupation phase of Site 68, near the Mesolithic-Neolithic transition. Perhaps, at this stage, the site had been reduced from a base camp to a permanent hunting station or boat station (cf. Bjerck 1990).

Non-permanent dwellings. The remaining dwelling units that appear to result from short term occupations (30C, 68B, 68E, and possibly 30B, 30D, 30G and 30H) are similar in size to the small houses. Dwelling 68E was proposed as the remains of a tent floor (Åstveit 2008c, 413). The small, short-term dwellings at site 30 may also have been tents, or light huts. They all appear alongside dwellings intended for long term occupation, on sites that may reasonably be interpreted as “residential base camps” (cf. Binford 1980). Of course, we have no way of knowing if these site areas were in continuous use as residential camps during the time spans suggested by the ¹⁴C-dates. The notion of “fluctuating permanence” (cf. Fretheim et al. 2016) may apply to sites as well as dwellings or dwelling plots. Stages of sporadic, short-term use may have interspersed the archaeologically more visible base-camp-stages. However, it is also probable that light huts or tents were regularly in use at the base camps, in addition to more permanent house structures. They could be dwellings for visiting family groups, airier

dwellings for use in the summer months or even dwellings related to practices of ritual seclusion.

Special-purpose shelters, not for occupation. According to Binford (1990, 122), even non-residential sites of modern hunter-gathers are rarely without some form of artificial shelter. The protection of various activity and storage locations from wind, sun, rain and vermin – or from sight – was presumably a common practice among the Late Mesolithic people of Central Norway as well. I have proposed a single dwelling from the Ormen Lange record as such a non-occupational shelter (30E, Fig. 16). Others are hinted at by the large number of unaccounted-for postholes and possible wall ditches found on residential sites, particularly Site 30. Along with the many exterior features documented on this site, they help in revealing the multi-purpose nature that marks a stable settlement.

Finally, judging from the Ormen Lange evidence, it is not so much a specific combination of attributes or features we need to be on the lookout for if we want to get a grip on the dwellings that represent the LM lifestyle. Rather, we should keep our eyes and mind open to the manifold expressions of dwelling practices, including signs of repeated use of both sites and potential dwelling plots. Aggregations of unaccounted-for postholes, pits, ditches, mounds, middens etc. are just as representative of these practices as the more easily definable dwelling remain units.

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CAPTIONS (FIGURES AND TABLES)

Fig. 1. Central Norway and the Island of Gossen, Aukra municipality, Møre og Romsdal County. Map by author.

Fig. 2. Site 68, combining single context recording with sections during the excavation of dwelling 68A1 (Tuft 1, Phase 1). Photo by L. I. Åstveit.

Fig. 3. The Late Mesolithic sites and dwellings from the Ormen Lange excavations, on the island of Gossen. Sites 33 and 62, which also included Late Mesolithic features, are outside the map area.

Figure 4. The first feature to be discovered beneath the cultural layer horizon of Site 30 was the central fireplace of dwelling 30A (S1), highly visible against the surrounding subsoil, in the initial test trench. Photo by L. I. Åstveit.

Fig. 5. The uncovering of Site 50. White dots (zip-lock bags) mark surface finds. The individual in orange marks dwelling 50A; dwelling 50B is located between the foreground trees to the right. Note the open landscape, providing excellent view but little natural shelter. Photo by H. B. Bjerck.

Figure 6. Simplified plan drawings of the LM dwelling remains from Ormen Lange. Figure by author, based on graphics from Bjerck (ed.) et al. 2008.

Fig. 7. Calibrated spans for ¹⁴C-dates related to each of the LM Ormen Lange dwellings (2σ, IntCal13). Darker shades indicate overlapping dates. Figure by author.

Fig. 8. Ormen Lange floor sizes and shapes compared to other excavated and well dated Norwegian Mesolithic dwellings. Dwellings with ¹⁴C-dates representing long time spans are sorted into 500-year chronozone based on their earliest reliable date only. Figure by author.

Fig. 9. Four different processes which all lead to the formation of wall mound features. Figure by author.

Fig. 10. Formation process of dwelling remains (wall mounds and housepit) after two rounds of construction, occupation, abandonment and post-occupational processes. Inspired by the multi-phased dwelling 68A at the Ormen Lange site 68. Figure by author.

Fig. 11. Dwelling 50A pre-excavation, with distinct mounds of sand and gravel surrounding the floor area. Photo by L. I. Åstveit.

Fig. 12. Upper left: Postholes at the 68A plot. Black postholes are associated with 68A1, blue postholes have not been ascribed to specific phases. Lower left: Assorted sections of some of the large postholes from the 68A1 phase. Right: Postholes from the area containing the dwellings 30A-D. Red dotted lines mark various sections. Figure by author, based on graphics from Bjerck et al. 2008.

Fig. 13. Segment of wall ditch S1034, partially emptied. Photo by L. I. Åstveit.

Fig. 14. Alternative interpretation of the 30E plot. Circular hut or tent floor (red dotted line) superimposed by rectangular, special-purpose shelter (blue dotted line). Figure by author.

Fig. 15. Vivianite in bone-rich cultural deposits at Site 30 turned a vivid blue when exposed to air. Photo by Ø. Skår.

Figure 16. Dwelling 68D post-excavation. One of two ventilation ditches running towards the central flagstone fireplace in the foreground. Photo by N. O. Sundet.

Figure 17. Site 30, distribution of lithics from mechanical layers B2-B4, 5-20 cm beneath peat bottom. Figure by author, based on Fig. 3.86 in Bjerck et al. 2008, by G. Jørgensen.

Figure 18. Lithic distribution on Site 69. Main concentration coincide with wall mound opening. Few artefacts in central floor area. Figure by G. Jørgensen (Bjerck et al. 2008, 431), translated and slightly modified by author.

Table 1. Dwelling attributes subjected to analysis.

Table 2. The LM Ormen Lange dwellings. Uncertain dwellings in red font.

Table 3. Mound composition values for Ormen Lange dwellings with wall mounds.

Table 4. General lithic distribution patterns associated with certain (black) and possible (red) LM dwellings at Ormen Lange.



Fig. 1



Fig. 2

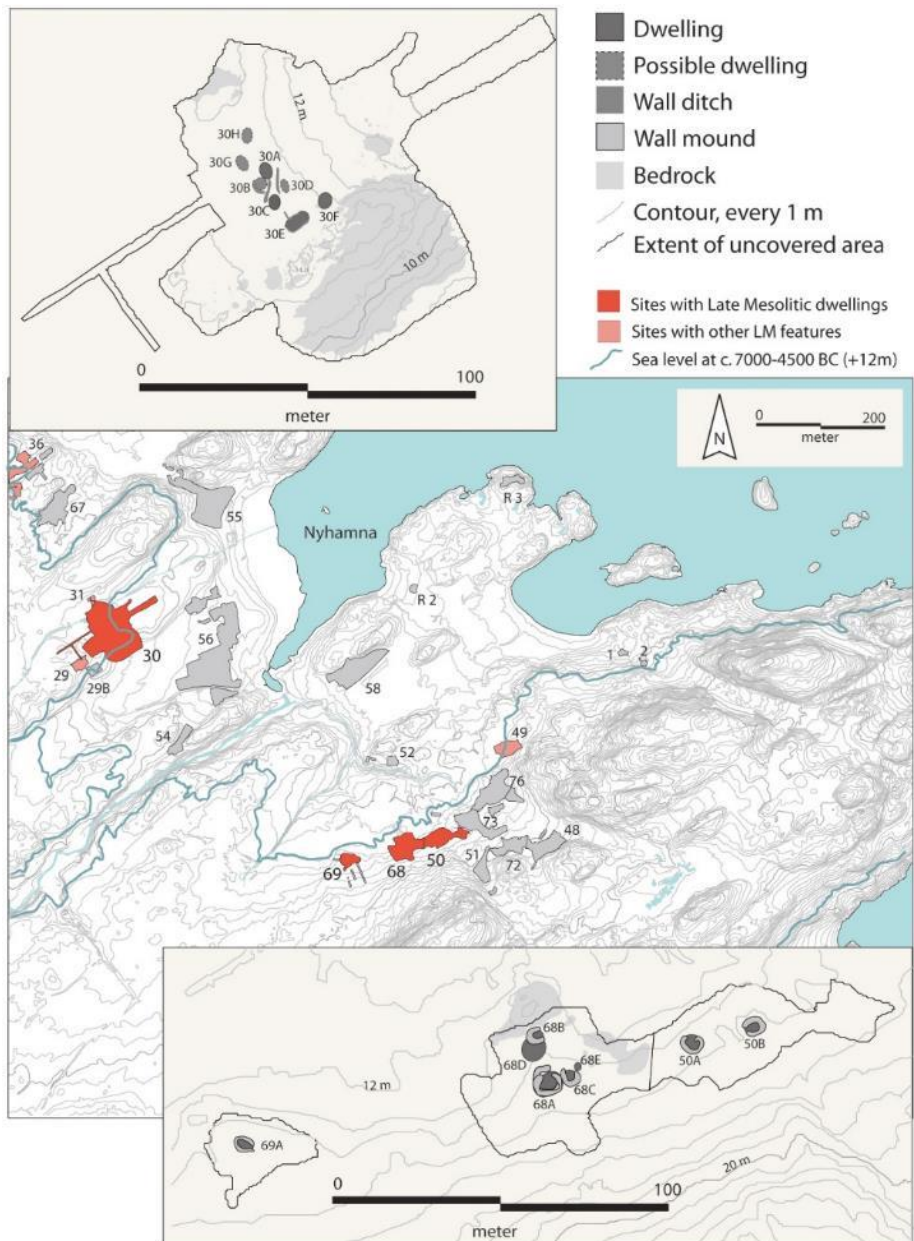


Fig. 3



Fig. 4



Fig. 5

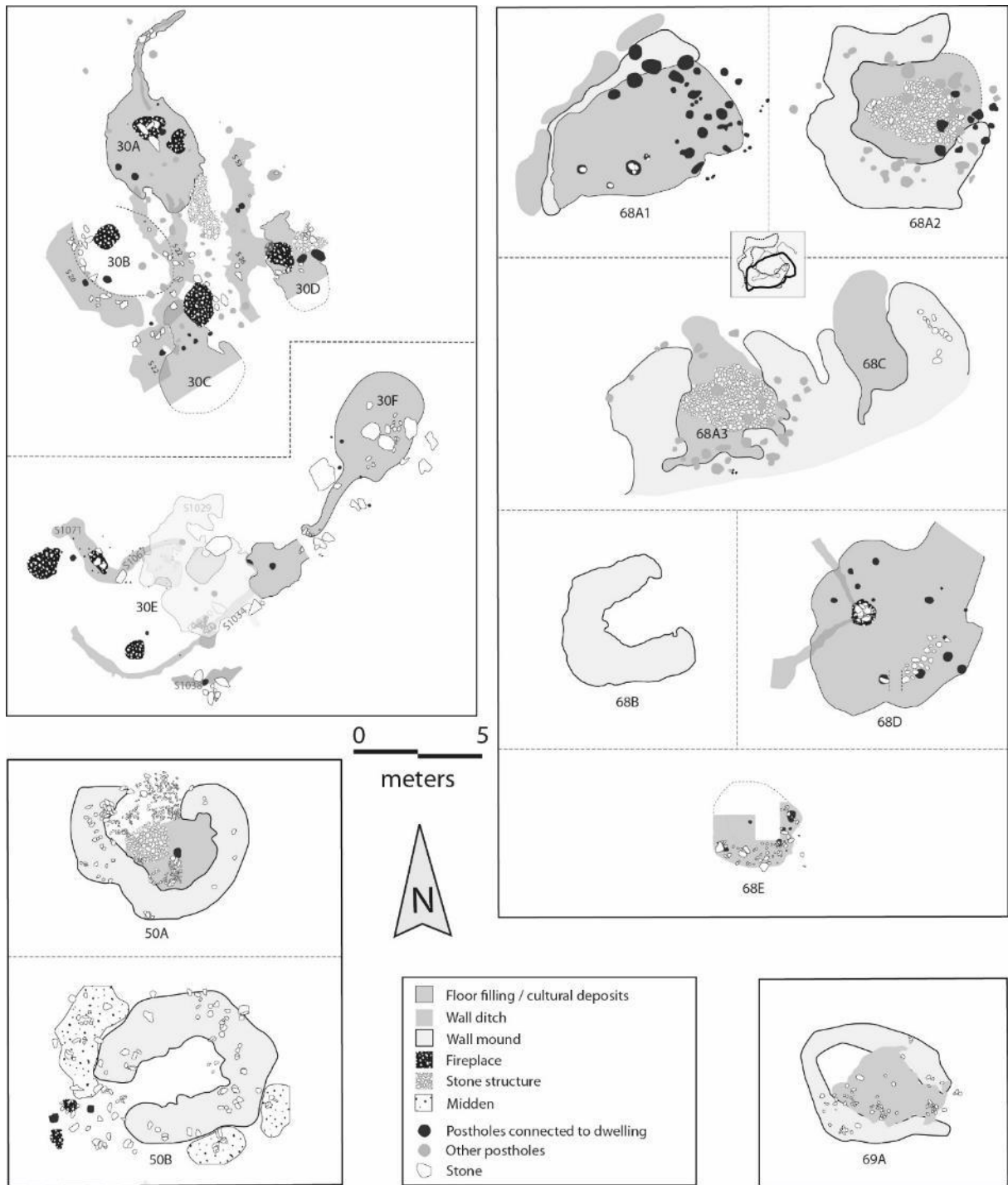


Fig. 6

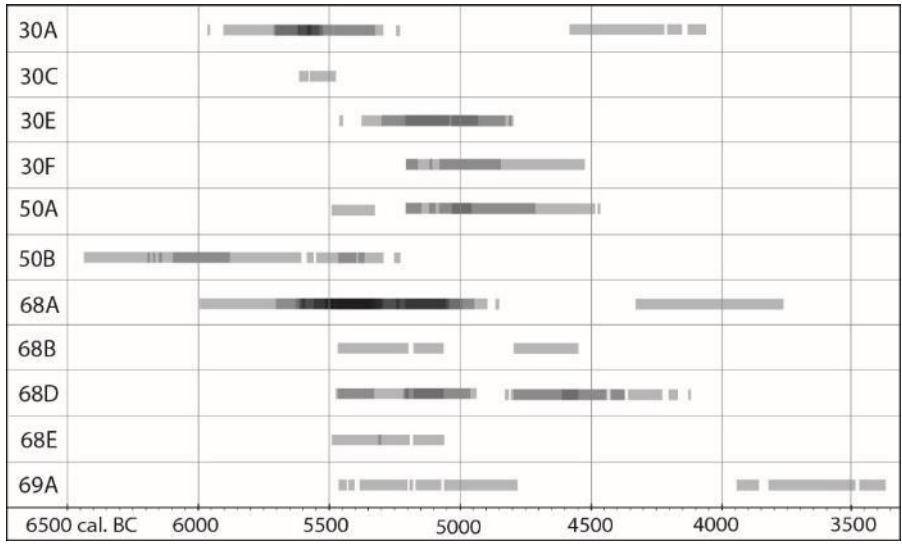


Fig. 7

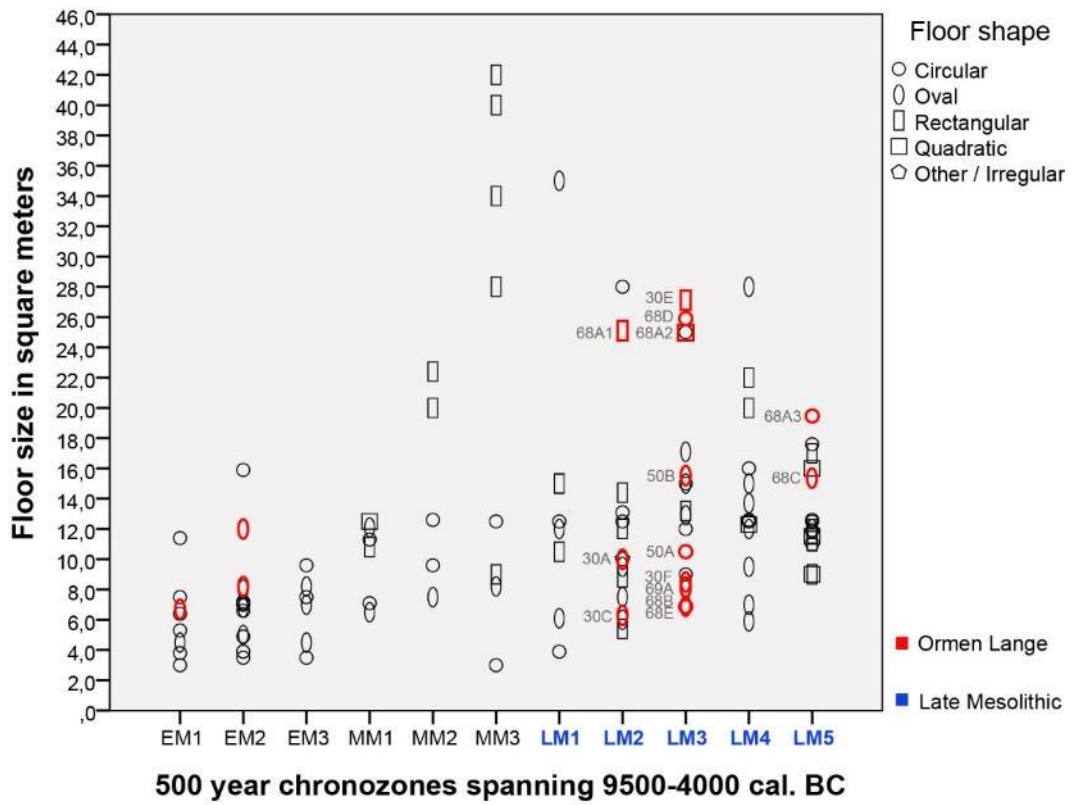
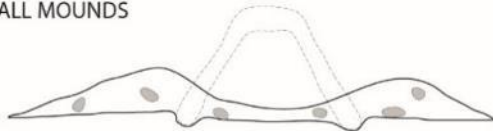
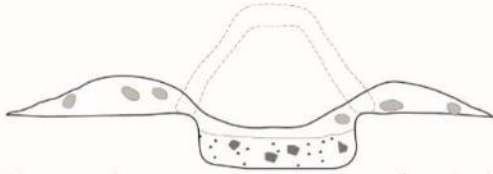


Fig. 8

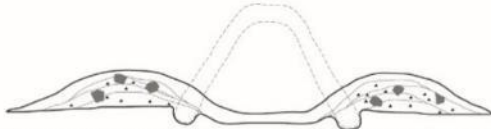
WALL MOUNDS



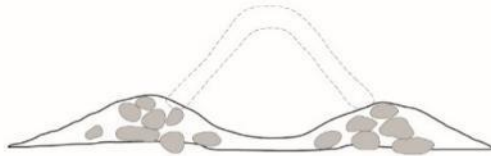
A: The mounds were made to encircle the walls, to stabilize wall-posts and/or inhibit draft at floor level.



B: The mounds represent excess masses, redeposited during the digging of sunken floors.



C: The mounds represent middens, built up during occupation, through clearing of household debris from the floor areas.



D: The mounds represents the tumbled-down remains of walls or wall foundations.

Fig. 9

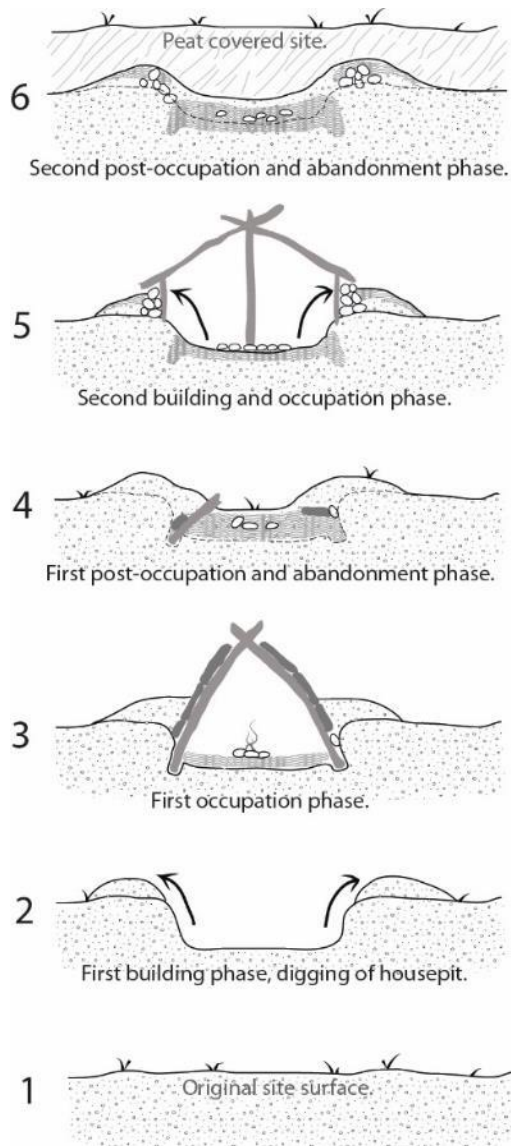


Fig. 10



Fig. 11

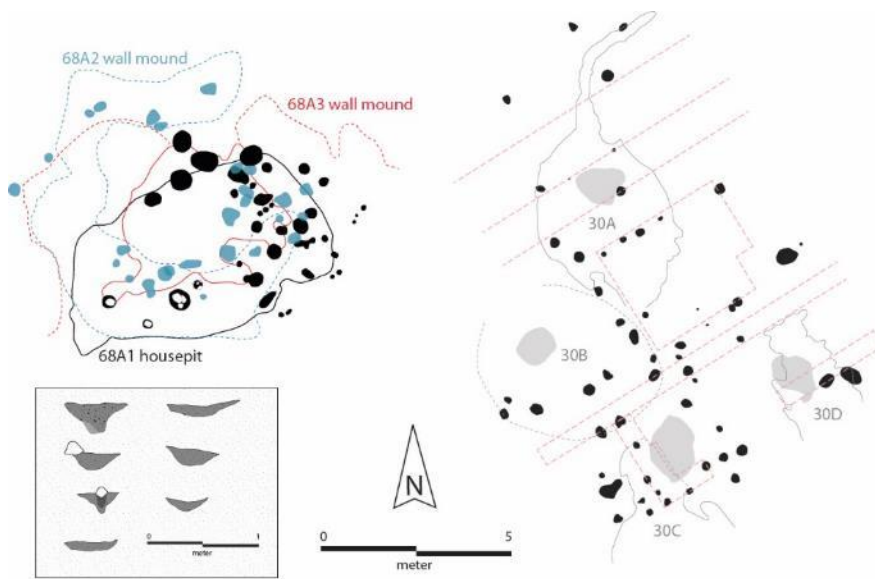


Fig. 12



Fig. 13

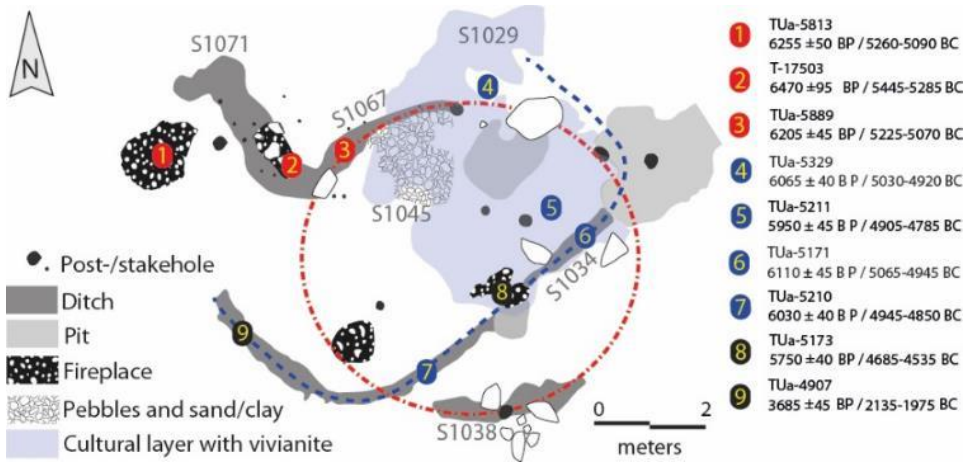


Fig. 14



Fig. 15



Fig. 16

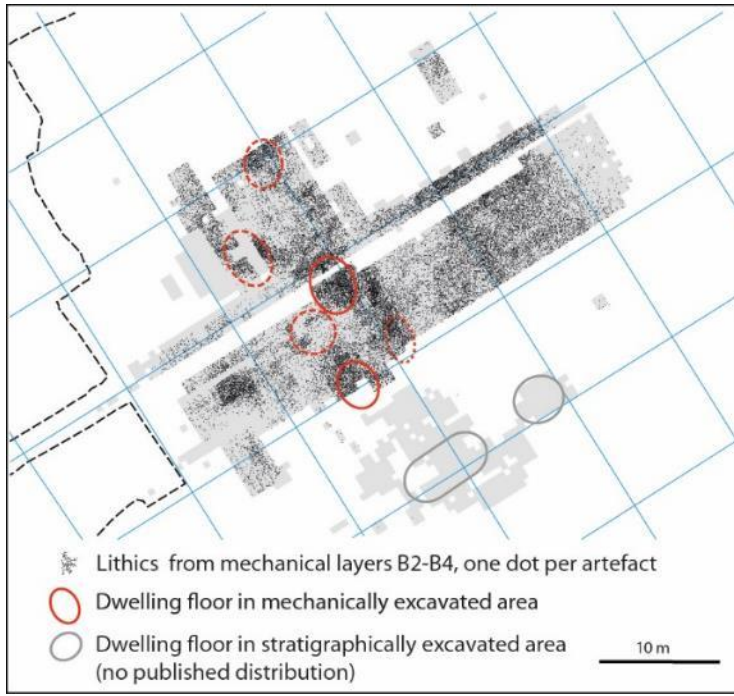


Fig. 17

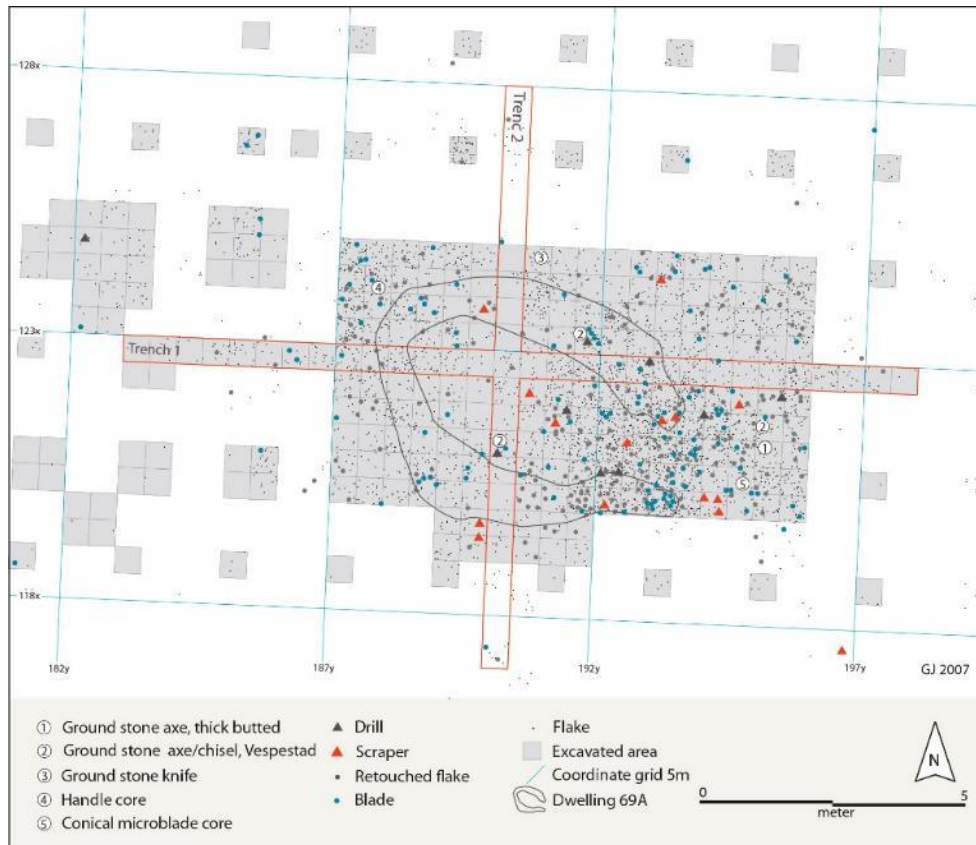


Fig. 18

Table 1. Dwelling attributes subjected to analysis.

<i>Dwelling attributes</i>	Relavant for interpretations of:
<i>Size, shape and modifications of floor area</i>	Dwelling layout and type; Time investment in the construction; Duration, phases and seasons of occupation; Size of inhabitant group.
<i>Wall mounds</i>	Construction (layout, type, sturdiness of walls and superstructure); Placing of entrance; Maintenance; Reconstructions; Occupation phases.
<i>Postholes</i>	Construction (layout, type, sturdiness of walls and superstructure); Reconstructions; Presence of internal features and activities.
<i>Wall ditches</i>	Construction (type and layout).

<i>Indoor fireplaces</i>	Internal activities, Duration and season of occupation, Layout and headroom of dwelling, Occupation phases.
<i>Lithic distribution</i>	Internal activities/activity zones; Extension of floor area/Presence of walls; Duration of occupation; Clearing/maintenance; Placement of entrances.
<i>Outdoor features</i>	Spectrum of site activities; Duration and season of occupation.

Table 2. The LM Ormen Lange dwellings. Uncertain dwellings in red font.

<i>Dwelling</i>	Original name(s)	Floor shape, size and max depth	Description / included features	Range of ¹⁴C-dates, cal BC
30A	S1	Oval, 4.0x3.2 m, 30-40 cm deep.	Distinct floor fill with concentration of lithics, two internal fireplaces, postholes in the floor area and along the walls, ditch stretching out from the floor - for drainage or ventilation. Possible entrance to the southeast.	5950-4050 cal BC
30B	S21, S22, S27, S29, S73	Circular, 3.5x3.2 m. Not sunken.	Area cleared of stones, central fireplace, "wall ditch" on one side, possible wall remains (stone structure) and postholes on the other.	5550 - 5350 cal BC
30C	S31	Oval, 3.0x2.5 m, 35 cm deep.	Distinct floor fill, postholes in the floor area and along part of the walls.	5600-5500 cal BC
30D	S32	Oval, 3.5x2.5 m. Not sunken.	Distinct cultural layer/possible floor fill. Internal fireplace, stone structure (small inside platform?), two postholes in the floor area.	Stratigraphical sequence suggests 5600-5400 cal BC
30E	S1034, S1067, S1029, "Fredly-huset"	Rectangular, 7.0x4.0 m. Not sunken.	Two (partially) parallel wall ditches - one of them with several stakeholes along the bottom. Two postholes in the floor area may have been for roof supporting posts. Bone-rich cultural deposits in/above the northeast floor area seem delimited by the southeast wall ditch. Several fireplaces in the area – two possibly related to the dwelling.	5300-4800 cal BC
30F	S1132	Oval/circular, 3.5x3.0 m, 20 cm deep.	Distinct floor fill. Postholes in part of floor area, near the wall. Ditch stretching out from the floor – probably for ventilation. Possible internal bench feature. Four large stones/blocks measuring 0.6-1.0 m	5200-4850 cal BC

			(three in the centre, one by the wall) may have been part of the dwelling construction.	
30G	S94	Oval/ irregular, 4.0x3.5m, 20 cm deep.	Distinct cultural layer/ possible floor fill with concentration of lithics, possible central posthole, two postholes in the wall area.	6100-5800 cal BC
30H	S128	Oval/ irregular, 4.0x2.0 m, at least 15 cm deep.	Distinct cultural layer/ possible floor filling with concentration of lithics, possible central posthole in the bottom of the floor area, two postholes near the wall area. Possible unstructured internal fireplace.	No ¹⁴ C-dates. Typologically dated to LM
50A	S1, Tuft 1	Circular, 3.8x3.5 m, 20 cm deep.	Surrounding wall mound (sand and gravel) with opening. Distinct floor fill, two overlapping central postholes, several postholes along the walls. A massive circular stone structure/platform established in the central floor area in a late phase, a sunken fireplace partly underneath the stone structure.	5500-4450 cal BC
50B	S3, Tuft 2	Oval, 4.5x3.6m, possibly sunken.	Surrounding wall mound (rich cultural deposits and turf/humus mixed sand/stones) with opening. No distinct floor layer. Possible internal fireplace near the back wall. Internal bench feature (turf) or part of collapsed turf wall. The dwelling appears to have been dug into the cultural deposits of an older site – possibly an older dwelling.	5300-5200 cal BC
68A1	Tuft 1, Phase 1	Rectangular/ Oval, 6.6x3.8 m, c. 30 cm deep.	Distinct floor filling, large amount of postholes (>30) visible beneath the fill in the northeast part of the housepit, mostly along the wall area. Possible entrance to the west. Ditch running parallel with the northern edge of the housepit – possibly a wall ditch, or for drainage.	5850-5600 cal BC
68A2	Tuft 1, Phase 3/4	Quadratic/ circular. 5.0x5.0 m. Not sunken.	Wall mounds (stone structure with some cultural deposits between the stones, interpreted as remains of dry stone walls) on three sides. Opening towards the east, but entrance could also be to the west, between stone walls/packings. Cultural deposits built up between the walls. A large number of postholes, mostly in/near the wall area. A cobblestone floor added on top of the cultural deposits at some late stage, or possibly early in the next phase.	5500-5200 cal BC
68A3	Tuft 1, Phase 5	Circular/ trapezoid, 5x5 m. Sunken?	Two curving/diverging wall mounds (mainly rich cultural deposits, particularly in the east wall) stretching out from the raised beach in the south, and surrounding a distinct floor filling. Opening/entrance to the north. Some of the many postholes in the area may be related to this phase, too.	4250-3800 cal BC

68B	Tuft 2	Oval/ U-shaped, 3.9x2.1 m, 20 cm deep.	Depressed floor area surrounded by U-shaped wall mound (stone packed – especially in the south) with opening towards the east. Dispersed patches of cultural deposits inside the sandy floor area.	5450- 4550 cal BC
68C	Tuft 4	Oval/ trapezoid. 5.0x3.5m, possibly sunken.	Two low, curving/diverging wall mounds (with stone packings) stretching out from the raised beach in the south, surrounding a distinct but shallow floor fill (with ochre). Line of stones along the top of one wall mound – possibly part of the wall structure. Narrow ditch stretching out from the floor.	No ¹⁴ C-dates. Possibly contemporary with 68A3
68D	Tuft 5	Oval/circular, 6.0x5.5m, 25 cm deep.	Floor fill in distinct depression. No apparent wall mound. Postholes, mostly along the wall area. Central flagstone fireplace, two ditches leading out from the fireplace through the wall area, for ventilation. Floor area covered with packing of small stones in a late phase, when the floor level was no longer sunken. A stone feature (dry stone wall?) along the south wall area also appears to be a late addition.	5200 - 4100 cal BC
68E	Tent ring	Circular?, 3.0x3m?, Not sunken?	Floor fill up to 30 cm deep. No wall mounds. Central floor area cleared of stones. Stakeholes and three fairly large postholes along the wall area. One stakehole in the floor area.	5500-5300 cal BC
69A	Tuft S1	Oval, 3.0x3.5m, 35 cm deep.	Surrounding wall mound (compact sand/gravel mixed with peat and cultural remains) with opening. Floor filling with concentrations of ochre. A large, flat stone placed centrally in the floor area may represent a post fundament, eight small stone structures along the wall area may represent stone-linings for posts.	5450-1900 cal BC

Table 3. Mound composition values for Ormen Lange dwellings with wall mounds.

<i>Dwelling</i>	<i>Mound composition values</i>
50A	1 (sand, gravel)
50B	4/5, 2 (cultural deposits, humus, sand, stones)
68A2	3 (dry stone walls?)
68A3	5 (rich cultural deposits)
68B	3 (stone packed, especially in the south)
68C	3 (stone packings along the inside and part of the top)
69A	4, 2 (sand, gravel + humus and cultural deposits)

Table 4. General lithic distribution patterns associated with certain (black) and possible (red) LM dwellings at Ormen Lange.

<i>Dwellings/possible dwellings</i>	<i>Associated lithics distribution</i>
30C, 68A1, 68B	No clear pattern associated with the dwelling.
30B, 50B	Markedly fewer lithics in the floor area than outside + no obvious “door dump” or concentrations along the wall area.
50A, 68A2, 68A3, 69A	Floor area cleared or partly cleared of lithics (“door dump”/concentrations along the walls).
30E, 68C	Artifacts are concentrated in the floor area, but mainly to one half or less of the floor.
30A, 30D, 30F, 30G, 30H, 68D, 68E	Artifacts restricted to and covering the floor area (“wall effect”).