

Everyday Life at Bjerre Site 7, a Late Bronze Age House in Thy, Denmark

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Bjerre 7 is a modest Late Bronze Age house in Thy, Denmark. Excellent preservation and full-recovery techniques provided comprehensive evidence of farm self-sufficiency, local exchange, and amber collection for trade. Spatial analyses of ceramics, lithics, plant macrofossils, and amber identified distinctive activity areas at both ends of the house and outside. Routines are discussed for refuse disposal, ceramic use in everyday activities, ad hoc knapping and use of flint tools, plant processing, and amber storage. The household was economically generalized and largely self-sufficient, with limited specialization. Located close to the North Sea, the householders collected raw amber for trade. Metal was obtained from outside for a small-scale, household industry. Although some division of labour is likely, it seems that the whole household engaged in the diverse activities identified on site.

Keywords: Late Bronze Age, Denmark, household archaeology, palaeobotany, amber

INTRODUCTION

Farmsteads have been thought to represent independent households spread across Scandinavia from at least 2000 BC. As Jensen (1988: 161) states, ‘little doubt [exists] that each [farm] building formed a complete unit, whose material basis, however, could vary from area to area even within a single settlement’. This conclusion was based on the dispersed farms known from Scandinavian history, but this model may not necessarily apply to the Bronze Age. The evidence seems quite

equivocal, based on assumptions of normality in traditional Scandinavian society that require reconsideration (Gröhn, 2004). Distinction by status, for example, is a well-recognized factor, and Mikkelsen (2020) suggests that even common farms consisted of people of different standing, including the unfree. Although often isolated, farms sometimes clustered as hamlets and small villages (Artursson, 2009) but their self-sufficiency is difficult to ascertain. The study of the socio-economic organization of such farms or farmsteads is constrained by archaeological

methods developed to deal with intensively ploughed sites. Nonetheless, the well-preserved occupation layers of one Late Bronze Age farmstead at Bjerre gave us the opportunity to consider these ideas substantially and theoretically (Bech et al., 2018).

The independent Scandinavian farm fits a theoretical model applicable to many traditional societies. At scales ranging from egalitarian local groups to stratified agrarian states, households were, ethnographically, basal economic and social units (Johnson & Earle, 2000). The significance of independent households comes from three theoretical approaches that have emerged independently but should be considered together. First is the Germanic Mode of Production (GMP) as originally suggested in the *Grundrisse* manuscript (Marx, 1974) and adapted to archaeology by Gilman (1995; Earle & Kristiansen, 2020). Based on an historical understanding of northern European societies, the GMP recognizes that often isolated agropastoral farms owned fields and animals, allowing self-sufficiency and independent action. The GMP can best be understood as anarchistic (Angelbeck & Grier, 2012), with the capability, even propensity, to self-organize.

Second is the Domestic Mode of Production (DMP hereafter), introduced by Sahlins (1972) and adapted to archaeology by Earle (2002; Cveček, 2021). Refining Polanyi's concept of householding, Sahlins suggests the DMP as a base strategy to meet household needs. Although always tied into systems of interhousehold reciprocity, political taxation, and even market exchange, these domestic units sought self-sufficiency to reduce risks and uncertainty. Sahlins emphasized that households were traditionally organized by elemental divisions of labour (age, gender, and special

expertise) involving family members extended as necessary to meet work requirements.

Third is the House Society as introduced by Levi-Strauss (1982) and made popular in archaeology by Beck (2007) and others. As a social group, the House was seen as a minimal corporate group owning land and other material and non-material things. The House was the base social unit with kin and non-kin members. Slaves were important in Levi-Strauss' original case (North-west coast Native Americans), and the organization of the House fits the objectives proposed by Sahlins.

To investigate householding concepts in Denmark, the Thy Archaeological Project (Bech et al., 2018) examined changing domestic economies in north-western Jutland. At the Bronze Age settlement of Bjerre in Denmark, we excavated two habitation sites (Early Bronze Age Bjerre 6 and Late Bronze Age Bjerre 7) to study patterns of everyday life. Located on Jutland's north-western coast, Bjerre lies on an old sea floor, close to an ancient shoreline. Soils are flat, moist and sandy, and they were extensively farmed in the Bronze Age.

Analysed here, Bjerre 7 offers exceptional opportunities to scrutinize a well-preserved house with an associated occupation layer and features (see Supplementary Material). Using systematic full-recovery and recording techniques, we excavated a longhouse and immediately adjacent activity areas (Olsen & Earle, 2018). Four radiocarbon measurements date the site to the ninth century cal BC, within the Late Bronze Age period V (Figure 1).

In this article, two research questions refer to the operation of the farm as a socio-economic unit: did the farm constitute a largely independent household unit responsible for meeting the requirements

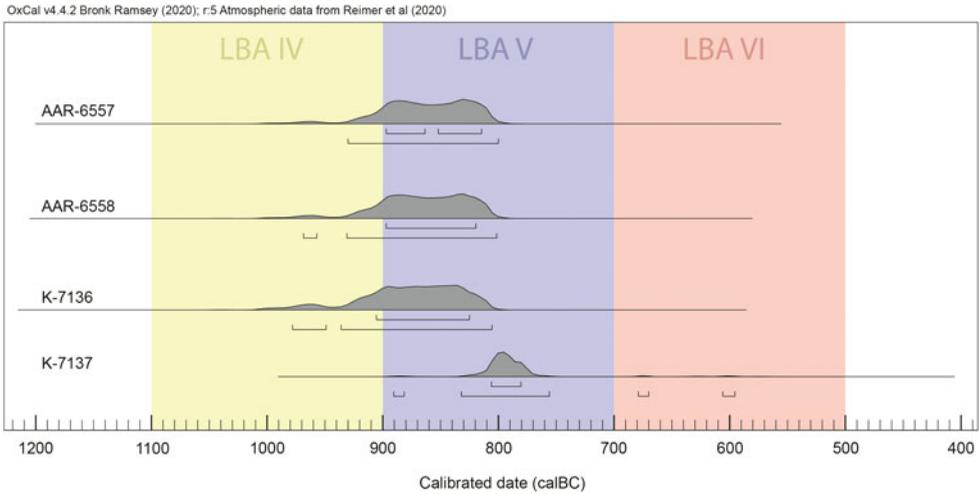


Figure 1. Radiocarbon dates from Bjerre 7.

of everyday life? And if so, how were tasks organized internally for self-sufficiency?

We propose that Bjerre 7 provides archaeological evidence of a Scandinavian farm oriented towards self-sufficiency, using locally available resources and technologies designed to provide shelter, warmth, and subsistence, with evidence of food preparation, tool making, and possibly household ritual. Collecting amber, an opportunity offered by the farm's proximity to the North Sea, allowed it to acquire metal for small-scale production. The farm appears to have been occupied by a single family engaged in different rather *ad hoc* activities not strongly divided by gender roles.

SHELTER AND WORK AT BJERRE SITE 7

Bjerre 7 consists of a farming household defined by features preserved *in situ* below its occupation layer. The house structure and related pits document inside and outside facilities for shelter, warmth and light (fire), and refuse disposal (Figure 2). The dwelling itself was a three-aisled, trapezoidal longhouse, oriented NW-SE, at least 15 m long and narrowing from 5.5

m at the west to 4.5 m at the east. At the south-east, a limestone entrance pavement (N4) was recorded 12 m from the western end. Patches of clay and dark, cultural deposits that we identify as a compacted earthen floor partially disturbed by post-occupational ploughing. The dwelling was a fairly simple structure, resembling other asymmetrical Late Bronze Age structures (Davidsen, 1982), with size and construction suggesting a commoner household (compare other Bronze Age house excavations at Bjerre; Bech et al., 2018).

House construction was slight and irregular. Five pairs of roof-supporting posts provided framing in two crooked lines: two pairs formed a square in the west, single pairs occupied the east, and two posts were unpaired. The postpipes ranged from 6 to 20 cm in section, indicating a modest construction. One post-pipe retained traces of alder, a locally available, poor-quality wood. The outer posts were smaller, probably supporting wattle-and-daub walls. The variation in spacing between the wall posts is probably due to poor preservation.

Three feature clusters existed within the house, and several fire features were

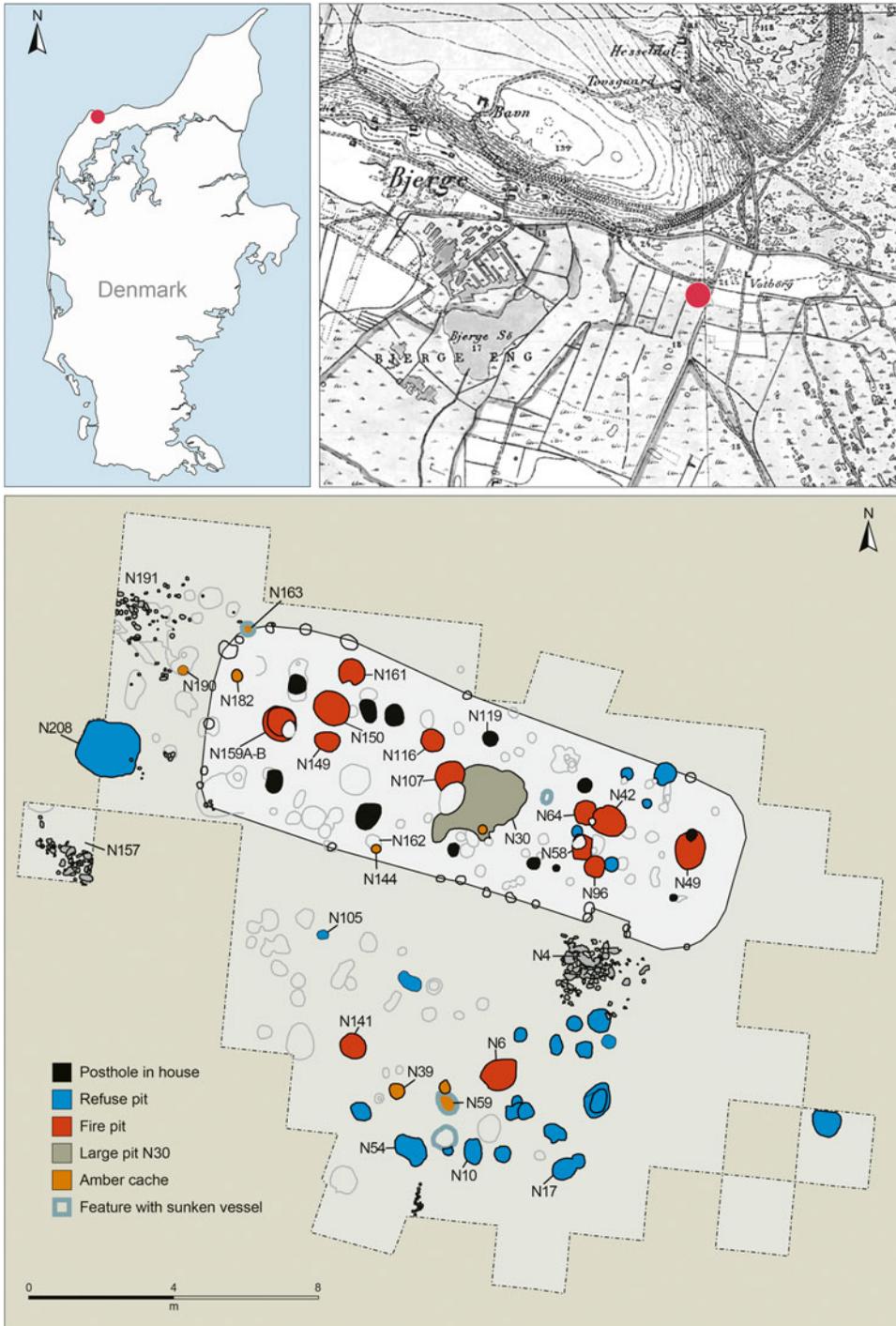


Figure 2. Location of Bjerre 7 and excavation plan showing the house structure, activity area, and major coeval features.

identified in each cluster, at the transition between the occupation and underlying layers; the basal layers in the pits contained homogeneous, charred material, which palaeobotanical analysis identified as peat. The western cluster comprised four fire pits (N149, N150, N159A–B, and N161); N159A was 36 cm deep (interpreted as a fire pit), others were shallower (12–24 cm deep, identified as hearths). Two hearths (N116 and N107) were in a central position. At the eastern end, near the entrance, a cluster of four fire pits (N42, N58, N64, and N96) was recorded; N42 and N96 were deep with flat bases, N58 and N64 were shallower. A hearth (N49) was found farther east. The fire features would have provided heat, light, and cooking throughout the house.

Other features included a sunken pot containing an amber cache (N163), an unusually large central pit (N30, 2 m across and 30 cm deep) with vertical sides and a horizontal base suggesting a cellar, and a sunken storage pot close to N30. A number of other poorly defined features were identified, a few used for refuse disposal.

Outside the house, limited funding precluded extensive excavations. It is highly likely that structures and features remain unexplored. One possible irregular structure includes a limestone pile (N157) to the south-west of the house.

Two outside activity areas (south and west) were defined by pits used primarily for refuse disposal but also for fires and storing amber. To the south, and extending almost as far as the eastern end of the house, were many features separated from the house by a 2 m-wide void bridged by the entrance pavement. Some twenty-three refuse pits contained pottery sherds, flint, charcoal, lumps of unfired clay, and a few amber pieces. Two features (N6 and N141) were fire pits with charred layers in their base.

To the west, and extending beyond the excavation area, features were dedicated to

cooking, refuse disposal, and amber storage (N190). An irregular, shallow depression (N191), at least 4 m across, contained a peaty fill above a thin clay layer; assorted refuse filled this wet depression, perhaps representing a workspace. A pit with at least six phases (N208) documenting fire and refuse disposal was located nearby, capped by a peaty layer containing flint, pottery, and chalk.

The features at Bjerre 7 defined a house and working yard used for different activities. We conclude that the household group would have been capable of performing all the tasks involved in building and maintaining such a simple structure and facilities. All materials (timber, branches, thatch, limestone, and clay) were locally available. We shall now turn to the excavation of the well-preserved occupation layer at Bjerre 7 to investigate whether more can be added to the interpretation of the features themselves.

BJERRE SITE 7: HOUSEHOLD ACTIVITY PATTERNING

Artefact distributions across a living surface can define activity patterning, as exemplified in American household archaeology (Wilk & Rathje, 1982). Bjerre 7's good preservation conditions meant that archaeological methods for intensive, systematic artefact recovery were appropriate. They included systematic sampling for flotation and full soil screening (sieving), which provided comprehensive data sets for the analysis of plant macrofossils, ceramics, lithics, and amber. The macrofossils included 12,000 grains and parts of cultivated plants, 6000 arable weed seeds, 30,000 seeds from other wild plants, and more than 700 twigs, leaves, and flowers from heather and shrubs. The most common artefacts were 46,066 ceramic sherds, representing perhaps 200–500

discarded pots calculated from the number of sherds in reconstructed vessels. The second most common class comprised worked flints with 13,550 pieces, predominantly debitage (96 per cent), and 115 pieces of non-flint stone. Amber was surprisingly abundant. We begin by considering household activities involving food and crafts linked to the farm.

Activity patterns associated with *in situ* features and artefacts document tasks that took place immediately around the farmstead. Most evidence is circumstantial as we rely on the simplest explanations derived from standard patterns observed among traditional peoples. When possible, we shall examine contrasting and common patterns between inside *vs* outside activities and between the five feature areas. Levels of analysis depend on the contexts of the finds defined by site formation processes (see Supplementary Material). Here, we consider tasks oriented towards household subsistence, self-sufficiency in food, and technology, and address questions of specialization involving exchange. While we try to avoid hesitation in our exposition, the tentative nature of our modelling must be taken as read.

FOOD TASKS AT BJERRE 7

Crops and animal products were raised nearby in the fields and pastures surrounding the site and were prepared inside and outside the house, and eaten by household members. Fish was caught locally. All subsistence resources could, and probably were, regularly procured by household members.

Household cuisine

Plant macrofossil remains (Figure 3) document cereals and oil plants basic to

household cuisine (Henriksen et al., 2018). Barley (*Hordeum vulgare*), bread wheat (*Triticum aestivum*), emmer (*Triticum dicoccum*), and spelt (*Triticum spelta*) were routinely recovered by flotation at Bjerre 7, as at other Danish Late Bronze Age sites (Robinson, 1994). Oil-rich plants included gold-of-pleasure (*Camelina sativa*) and two flax (*Linum usitatissimum*) seeds, attesting to the early cultivation of flax in Denmark. The seeds of these two plant species contain up to 40 per cent oil, and they were also found together in an Iron Age site in Thy (Henriksen & Harild, 2020).

The fields surrounding Bjerre 7 were capable of producing these crops, as documented by ard-marks in soil horizons above, below, and outside the occupation layer. The ard-marks indicate regular fields, suggesting sustained farming, as does the presence of carbonized arable weed seeds. Flint blades (as well as heavy knives and laterally retouched flakes) probably served for harvesting (Figure 4 e–g), but they were all-purpose cutting tools that could have had multiple uses. Blade-like flakes have lateral retouching or natural backing, creating a sharp blade with a blunt back suitable to be handheld, and some were used for cutting plant material, as indicated by silica gloss; however, their varied forms suggest a range of uses (Jensen, 2018: 367ff). We know little about Late Bronze Age tool hafting, except a preserved example of a hafted blade knife used for harvesting from eastern-central Jutland (Jensen, 2018: 368). Our large blade knives show traces of similar hafting.

Domestic animals are likely to have been raised in the grasslands and fields around the farm, but, because of soil conditions, their bones did not survive. Bones of cattle and sheep/goats were present at other Bjerre farms (Nyegaard, 2018). Supporting evidence for animal use in

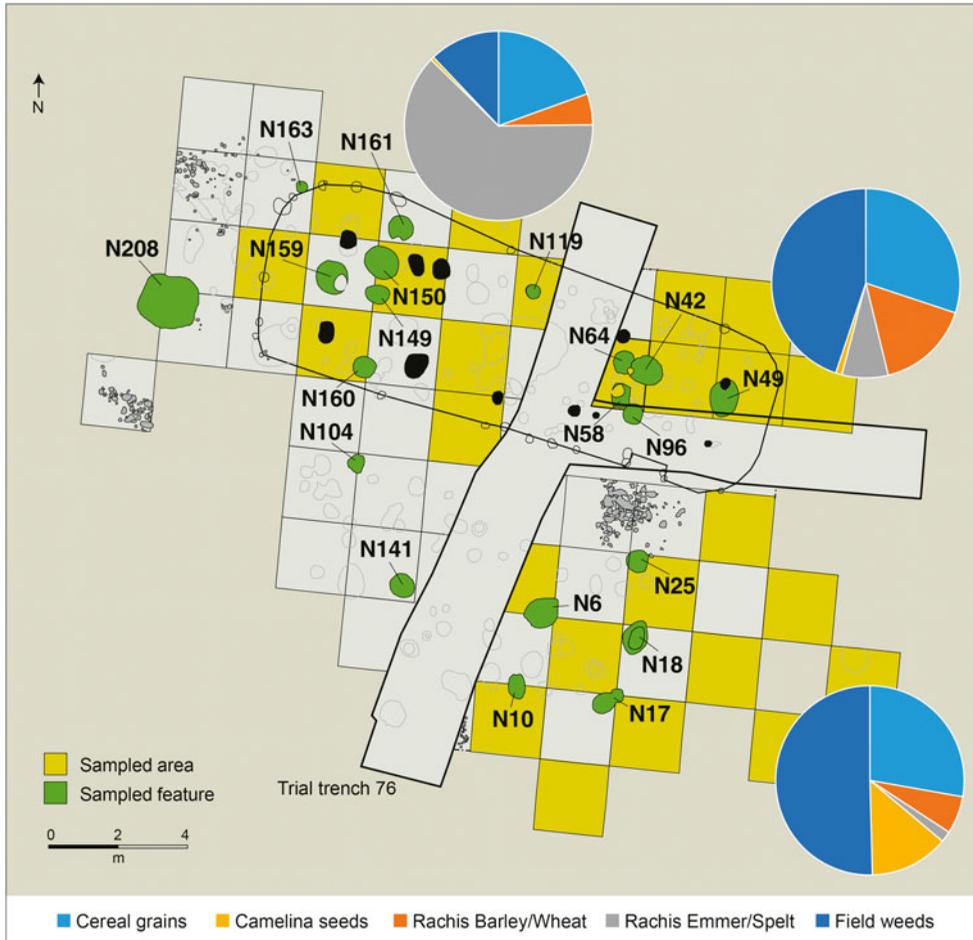


Figure 3. Distribution of food-related plant macrofossil remains from activity areas at Bjerre 7.

Bjerre 7 includes animal dung as fuel, animal residue on ceramics, and heavy-duty flint tools used for such activities as cutting and scraping likely involving bone in addition to wood. Fish is documented in a refuse pit (N208), where chalk conserved many partially burnt fish bones and scales of local salmon/trout (*Salmo*) and stickleback (*Gasterosteidae*).

Food preparation, cooking, and serving

Fire features (hearths and deeper fire pits used for cooking), plant macrofossils,

ceramics, and non-flint stone artefacts constitute primary evidence of activities linked to food preparation. Flotation samples provided good evidence for burnt seeds and fuels that could be locally procured from Bjerre's environs. Although burnt fuel was found in virtually all samples, almost no wood charcoal was present, which corresponds to the almost treeless landscape around Late Bronze Age Bjerre (Søgaard et al., 2018). Instead, burnt peat is documented by seeds and the root parts of sedges (*Carex*) and heather twigs (*Calluna*) as well as burnt animal manure, as attested by stem fragments and

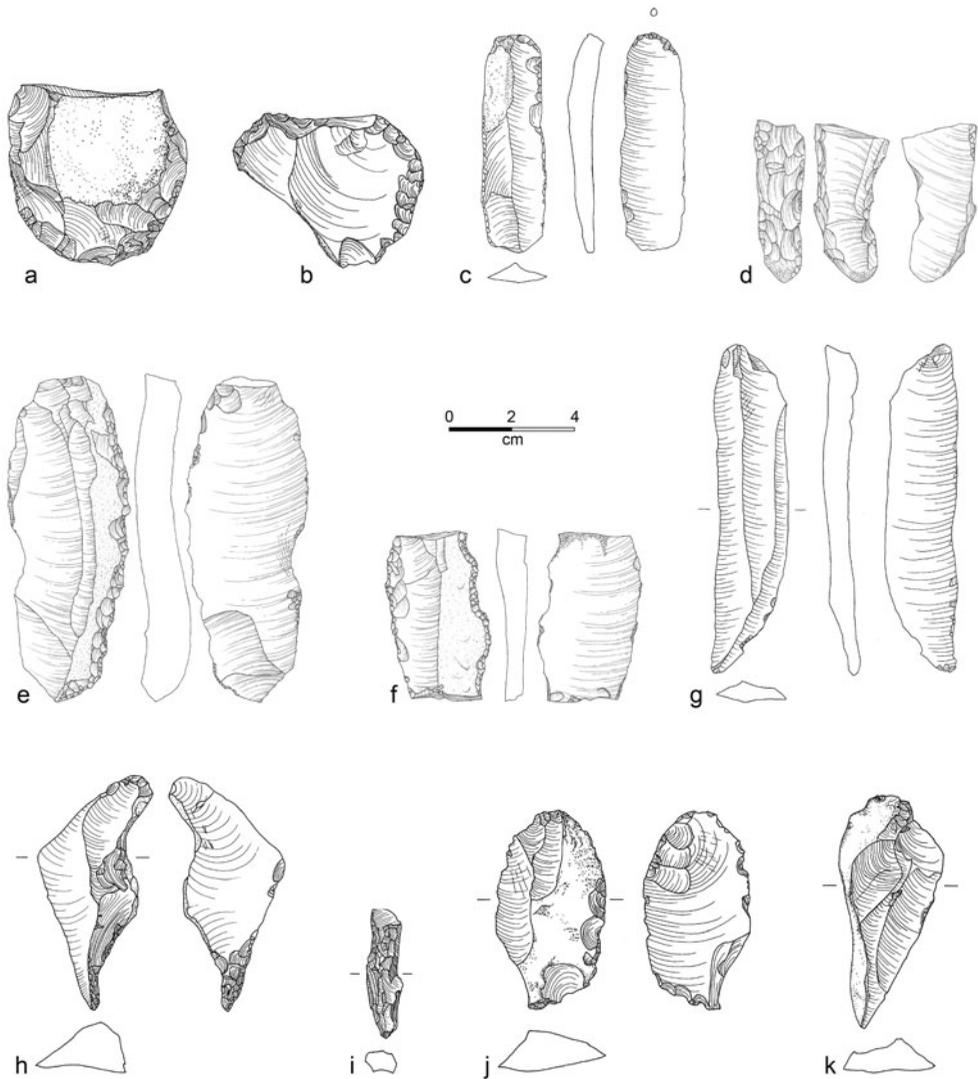


Figure 4. Characteristic flint artefacts from Bjerre 7 (a–b: scrapers; c–d: strike-a-lights; e: heavy blade knife; f: laterally retouched piece; g: sickle blade; h–i: borers; j–k: ad hoc tools).

seeds from grass (*Poaceae*) and clover (*Trifolium*). More than half the 9000 seeds from grasses were found in the house's easternmost pit (N49), with intact droppings from sheep or goats, indicating that manure was burnt here. Eight strike-a-lights made from local flint were identified, half of them confirmed microscopically as fire starters.

Macrofossils can document steps in preparing and cooking plants within the

household. The ratios of plant seeds and parts show areas where the harvest was cleaned (high proportion of chaff and field weeds) *vs* cooking (high proportion of edible seeds). The distribution of the plant material across the site (Figure 3) shows food-related macrofossil remains divided into a) cereal grains (barley, wheat, emmer, and spelt); b) camelina seeds (gold-of-pleasure); c) rachis of barley/wheat (chaff); d) rachis of emmer/spelt

(chaff); and e) field weeds. Plant parts were all carbonized accidentally or as fuel in fire features, probably close to primary working areas.

The preparation and serving of food are documented by abundant ceramics and non-flint stone artefacts. We assume that most pottery involved storage, preparation, cooking, and serving foods, although identifying specific activities proved difficult because the assemblage was fragmented, and the vessels are likely to have had multiple uses. Nevertheless, a diversity of forms suggests different uses (Figure 5), including food preparation (cooking, straining), storage, and serving (thin-walled and/or decorated vessels), although only four vessels are preserved from rim to base and fifteen from rim to below belly. These vessels include two conical-neck examples (Figure 5g, h), two concave-convex vessels (Figure 5d, k), three pot- and barrel-shaped items (Figure 5e, f, l), and three miniatures (Figure 5a, b, c); strainers were also identified (Kristensen, 2018).

Some vessels have thick walls, including fifteen undecorated pots with wall thickness of 7–9 mm. Thicker walls probably made vessels more durable during cooking. Sherds with charred organic material represent c. one per cent of the total, burnt during cooking and perhaps disposal. They have diverse shapes and sizes, including a 3.4 cm-high vessel side (rim diameter: 8 cm), a handled vessel (diameter: 16 cm), and a barrel-shaped vessel (diameter: 32 cm) (Kristensen, 2018: 251ff.). The general lack of patterning suggests a rather *ad hoc* use of vessels.

Twenty-two sherds with burnt organic material were chosen for lipid analysis, to identify the presence or absence of lipids or low lipids, ruminant (adipose), dairy, terrestrial animal (non-ruminant), meat, and vegetable matter (Isaksson, 2018). Analysis of fifteen vessels with thick profiles documents a mixed agropastoral diet,

most with no/low lipid residues, a barrel-shaped vessel with terrestrial animal and vegetable residues, and one small vessel contained ruminant, vegetable, and meat residues.

Fifty-two sherds from four or more strainers had multiple drilled holes (2–6 mm diameter) placed variably a few centimetres below the rim, on the belly, and/or at the base. Although strainers are often thought to document cheese-making, four residue analyses show no traces of milk or plant-based liquids, and other uses like steaming should be considered.

For serving, vessel forms include three cups or small vessels, two bowls with or without handle(s), and two conical or biconical vessels. Four were analysed for lipids: a cup or small vessel contained ruminant, vegetable, and meat residues; a bowl contained milk and vegetable; and two vessels (a cup or small bowl and a conical or biconical vessel) had little residue. Vessel forms include both thinner and decorated vessels, which were most probably used for serving, because the risk of breakage was reduced and perhaps the transfer of information was more important. As discussed below, cooking and serving vessels show distinct distributions.

Stone tools were also used in food preparation. Non-flint stone artefacts included fragmented hammerstones and crushing stones (pestles) associated with plant processing (Eriksen, 2018: 303–06). They were recovered across the site, probably not where they were originally used. Many edged lithics could have served for butchering, although function is hard to determine and tool use may have been opportunistic.

The evidence from plant macrofossils, organic residue analysis, and from stone tools, suggests that food was produced and processed for use by the farm household. Although various forms of lithics and

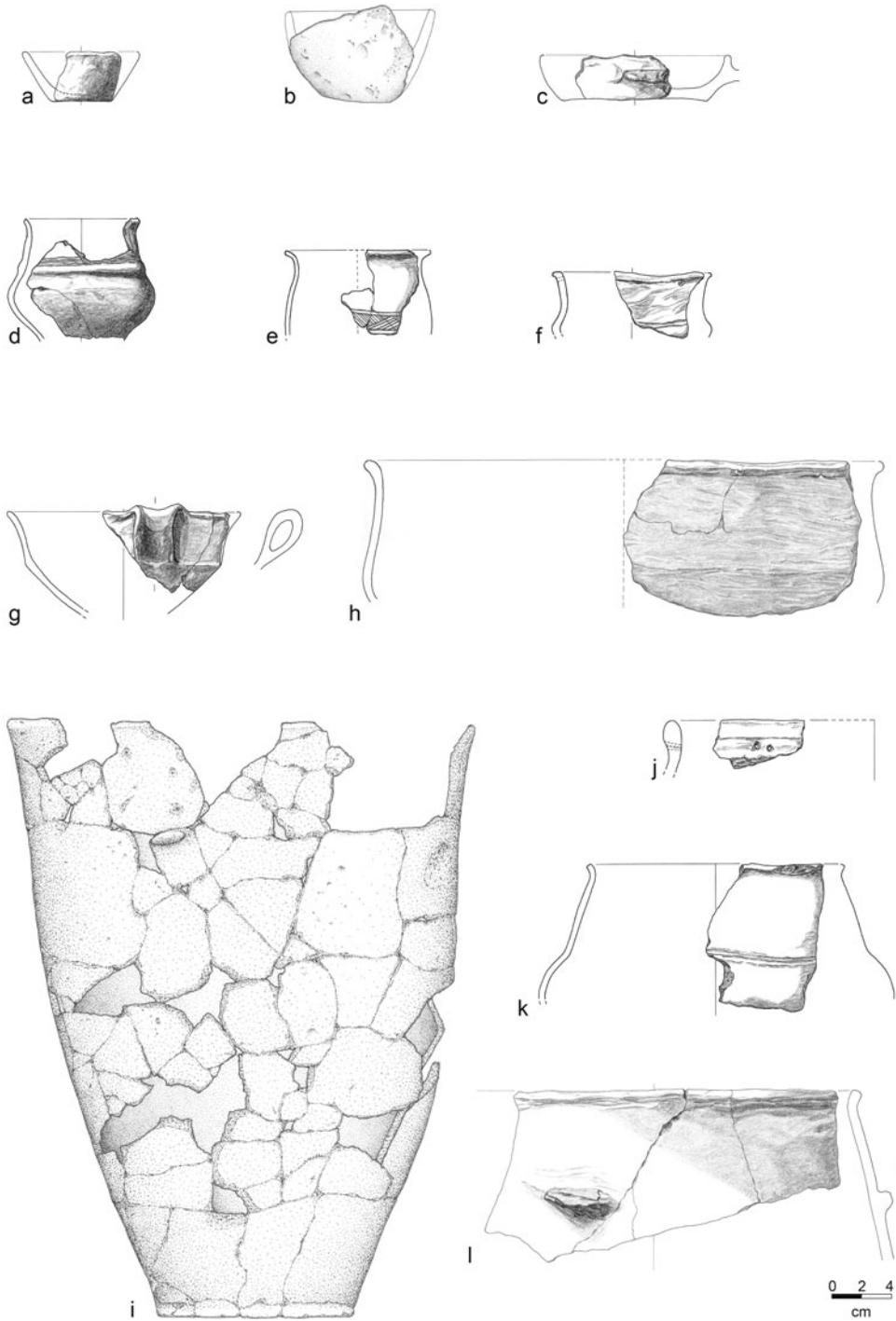


Figure 5. Ceramic vessel forms from Bjerre 7.

ceramics are present, these artefact classes show *ad hoc*, unspecialized, and variable uses. Related tasks were uncomplicated and could be handled by the farm's small workforce. House building may have required reciprocal participation by neighbours. As for the choices of cuisine, they seem to fit the DMP model.

TECHNOLOGICAL TASKS AT BJERRE 7

The tasks involved in resource procurement and making and using tools could all be, and probably were, performed by household members. Stone, moraine deposits, wood, bone, and skins were available, and tool manufacture suggests an *ad hoc* fabrication for household use. Small-scale metal production, evidenced at Bjerre 7, would have required imported metal, but the simple metallurgy suggests that production was for domestic use and perhaps small-scale exchange. Although ceramics were produced from local clays, no direct evidence exists for manufacture immediately around the farm.

Making stone tools

At Bjerre 7, debitage was abundant and ubiquitous, without obvious concentrations of debris. The materials were erratic flints and water-rolled cobbles available around the farm and probably collected as needed. On-site flintknapping is well documented by extensive lithic waste, including widely distributed nodules, cores, flakes, and shatter. No micro-debitage was recovered. Approximately half the scrapers (the most common tool) were fashioned on cortical blanks indicative of on-site manufacture, although refits were impracticable. Some borers are quite regular, typically with one or two pronounced tips. Classic drills are present, but others are best described as

'pointed tools'. One borer is made on an irregular quartzite piece, available in glacial deposits. No on-site evidence exists for skilled knapping; tool manufacture was simple and could be performed by anybody, anywhere, anytime for cutting, scraping, and drilling. Knapping was by direct, hard-hammer percussion to crude flake cores, supplemented by bipolar and anvil techniques to maximize raw material use. Two 'fabricators', heavy-duty tools used 'for retouching other flint tools, or for grinding, or [...] as part of a fire-lighting kit' (Butler, 2005: 56), were identified. Other tool uses are described under the relevant task categories. Overall, the lithic tool assemblage included tools for cutting, scraping, and boring, performed by a heterogeneous range of flint flake tools (including pieces with discontinuous, irregular retouch, notches, denticulation, etc.). Numerous retouched flakes display great variation, making it challenging to distinguish morphologically between more or less regular scrapers, knives, and retouched pieces. Most tools appear to have been multifunctional. Many *ad hoc* tools (274 examples) were recorded, along with scrapers (101), borers (62), and several large blade knives (26).

Making tools from wood and animal products

Although probably used for food preparation, the multiple-purpose lithic assemblage could also have served to produce tools and to build structures, evidencing organic materials otherwise not preserved, except for one bone spatula. The common scrapers served to work hard material like wood or bone (Jensen, 2000). Several fragmented scraper edges indicate heavy use and/or resharpening. Scrapers have a distinct angle along the edge, which varies considerably in steepness, and no

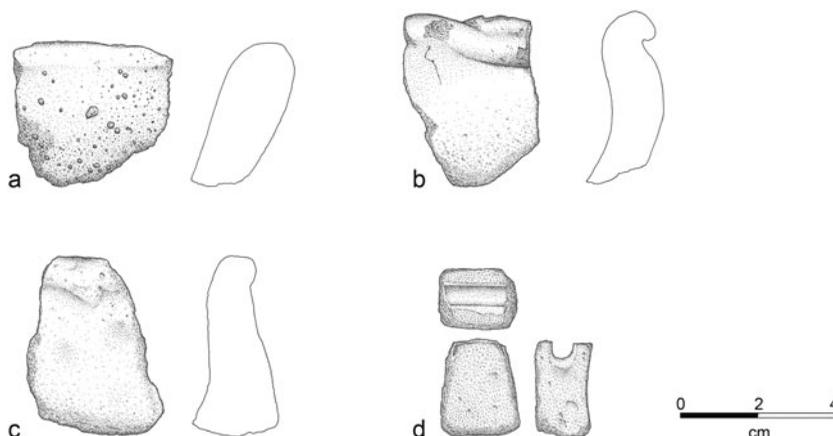


Figure 6. Metallurgical ceramics from Bjerre 7 (a–c: crucible fragments; d: mould fragment).

standardization exists in length, width, or thickness. Heterogeneous flint borers are our second-most common flint tool type. Many borers were put under great strain. Several were broken, and many tips show heavy abrasion, edge rounding, and splintering, presumably caused by boring into a hard material like wood, bone, or even stone.

Metallurgy

Small-scale, rather rudimentary metallurgy is documented by ceramic and stone artefacts at Bjerre 7. Since the technology was quite straightforward, it could have been conducted by experienced household members. The metal, however, must have been obtained through trade and recycling. Metal objects were probably intended for household use, but they could have been exchanged with neighbours.

For bronze working, nine ceramic pieces (crucible and mould fragments) were recovered. The crucibles (Figure 6a–c) and mould (Figure 6d) were made of local clay, but distinct from standard ceramics. The matrix of the crucibles was clay mixed with sand, and the crucibles were well fired with surfaces almost vitrified. It

seems likely that these pieces were made by the metalurgists themselves. The mould, although too fragmentary to identify what it was intended for, had two slots. Technically similar Late Bronze Age crucibles and moulds were found in a large refuse pit near Skive about sixty kilometres south-east of Bjerre.

Four stone artefacts were likely to have been involved in metalworking (Figure 7) (Eriksen, 2018: 306). The item illustrated in Figure 7a is a well-worn, fragmented whetstone made from a fairly coarse-grained sedimentary rock, used to sharpen metal edges or to remove irregularities from casting. The object illustrated in Figure 7b is tentatively interpreted as a small whetstone made from a fine-grained, slate-like sedimentary rock. The front is flat, smooth, and slightly faceted but not polished, the base is partly faceted, and a fine groove is visible on the back. The stone illustrated in Figure 7c is perhaps a cushion stone (hammer or anvil), made of quartzite. The lower face is flat and exceptionally smooth, the upper is rounded, and the side is grooved, presumably for fixing (Eriksen, 2018: 306f). The fragment illustrated in Figure 7d is a piece of grey-wacke with traces of modification that may have been a preform mould;

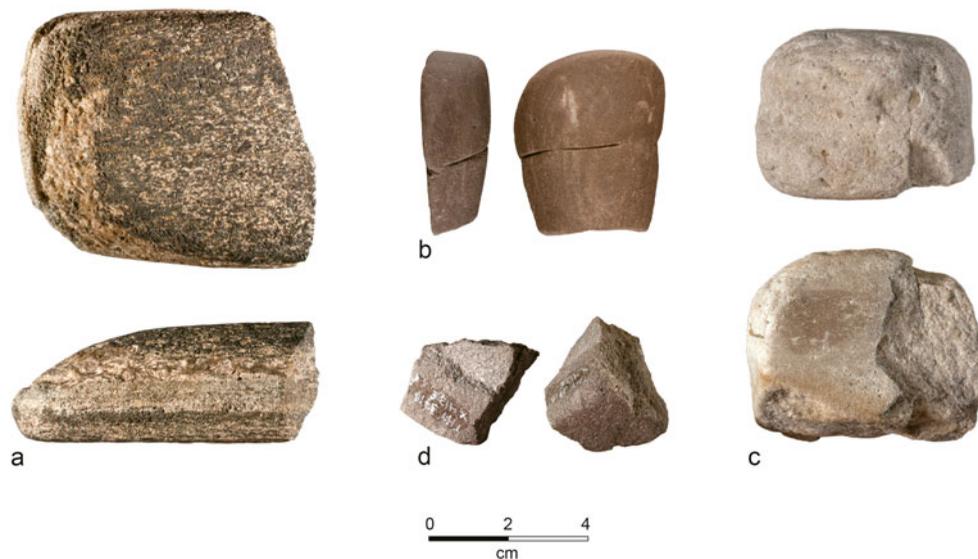


Figure 7. Possible metalworking stone tools from Bjerre 7 (a–b: whetstones; c: cushion stone; d: mould fragment?).

additional fragments of this material could not be refitted.

Pottery making

At Bjerre 7, evidence for ceramic manufacture is absent from the excavated area, although analysis of the pots' clays suggests that they 'seem to have local characteristics' (Rasmussen & Bech, 2018: 263). Small, well-rounded stones might, however, have been burnishers. Both the quantity and relatively high firing temperature of the Late Bronze Age ceramics (in contrast to those of the Early Bronze Age) suggest a degree of skill and scale in their production. Ceramic manufacture, not unlike metallurgy, is a messy affair producing considerable waste; hence, even if production had taken place away from the house, we would expect debris in the household refuse. Because pyrotechnic industries have considerable economies of scale (as *ad hoc* production for household use would be inefficient), ethnographic

evidence from traditional societies shows that part-time household specialists regularly produced pots (Miloglav & Vukovic, 2018). Although pottery is often assumed to have been produced by each Scandinavian farm, this seems unlikely. Suitable clays are not common, perhaps encouraging part-time specialization.

Summary: technological tasks

Tool making almost exclusively appears to have been largely for household use, in line with the DMP model. No evidence exists for specialized lithic production for exchange; production was *ad hoc* for a variety of activities, probably involving harvesting, making plant and animal products, and working wood and perhaps bone for tools, structures, and clothing. Local production is dominant, the exception being metallurgy. Although for household use, it required exchange-based procurement of metal. Bjerre 7 was technologically generally self-sufficient, but probably exchanged some

items locally, perhaps including ceramic vessels and a few stone tools.

EVIDENCE OF HOUSEHOLD RITUAL?

Although ritual is typically embedded in everyday and community life, evidence from Bjerre 7 is ambiguous. Small ('miniature') vessels could have been used for serving, or as ritual props (as they are often interpreted), or again as children's toys, or any combination. The clay of the item illustrated in Figure 5b is yellowish and badly fired. The vessel is poorly formed, with an uncertain diameter and irregular rim as might be expected for a pot made by a child or perhaps by a household member who is not a potter. Four distinctive vessels (a miniature, a shallow bowl, and two ornamented vessels) were found close to the entrance pavement (N4 on Figure 2). This does not appear to be random, and the context suggests that this cluster lies close to the vessels' place of deposition. Entrances are points of social transition that are often culturally significant, perhaps indicating a ritual function, although other interpretations are plausible (see Bradley, 2005). The abundant amber finds, however, show no evidence of ritual contexts.

EXCHANGE GOODS

While most food and materials used to make tools were probably obtained and transformed by household members for their own uses, tasks involving amber, metal, perhaps ceramics, and a few lithics were linked to local and longer-distance exchange, as detailed here.

Amber

Bjerre 7 shows evidence of sorting and storing amber (Earle, 2018). The site is

located close to the ancient coastline, and amber was probably procured along the beach by household members. All amber was raw, without any trace of modification or use within the household. We posit that it served as an exchange medium primarily to obtain metal.

Nearly 1800 pieces of amber were recovered during excavation. Most pieces were small, with a mean weight of just over 1 g. They were found in almost all contexts, from special storage pits to refuse disposal features, from sub-floor caches to the occupation layer. We identified seven caches (concentration: > 30 pieces), and amber was recovered from almost all (51 out of 53 = 96 per cent) 2 × 2 m excavation units targeting the occupation layer.

Caches appear in two contexts, pits and clusters. Pits originally contained sunken storage vessels. A distinctive storage vessel with associated amber was recovered from N163. As reconstructed, the vessel is 40 cm high with a rim diameter of 34 cm; these dimensions are outside those of food storage vessels, and the vessel could have held many kilograms of amber (Figure 5i); 863 raw pieces were recovered from N163, many directly on the *in situ* pot base, in the fill, and in the unit directly above it. Because the vessel base was only 24 cm below the occupation layer, its rim would have protruded from the ground level, providing easy access. The pit profile of N59 matched the contours of a storage vessel, and an inverted base was recovered in the pit fill, among eighty pieces of amber. Feature N190 contained the fragments of a third large storage vessel with a rim diameter of 40 cm and a horizontal lug, suggesting that it was transportable. Although no amber was found in the fill of that pit, two fragments adhered to the interior of a body sherd. With a scattering of 127 pieces of amber, pit N39 would seem to fit the category of vessel storage, but no sherds were recovered. At some

point during the life of the house, subterranean storage pots were broken, leaving variable amounts of amber behind. All storage in vessels was outside the house, although one vessel was located on the house wall-post line and may have been accessible from inside the house.

Two clusters (N30 and N182) suggest that amber was packed in a small bag or other container. One cache, within the cellar N30, consisted of 158 pieces (132 g) tightly packed together, including the largest chunk (39.5 g) excavated by the Thy Project. Despite some rodent disturbance, the dense packing appears similar to a sub-floor cache from Bjerre 6 that was interpreted as a small bag of amber. As for N182, it was a posthole containing a dense packing of thirty-three pieces of amber. In another shallow, saucer-like pit (N144), a scattering of forty-nine pieces was recovered, perhaps representing a disturbed concentration. It is possible that bags of amber were stored within the house.

Other materials and tools for exchange

Household bronze metallurgy requires metal obtained as ingots or scrap, possibly through long-distance trade. Additionally, because metallurgy and ceramics are technologies with strong economies of scale (decreasing costs with expanding volume), it is likely that both products involved exchange between households engaged in part-time specialization. Probably, some metal products were traded out, and ceramics traded in.

Two formally diagnostic lithic blade knives found at Bjerre 7 appear to have been obtained by regional exchange. In central Thy, a specialized knapping site for such Late Bronze Age knives has been identified (Masojć, 2016: 62ff), and it may be that special skills or flint encouraged such part-time specialization.

We contend that the household at Bjerre 7 engaged in part-time tasks gathering considerable amounts of amber to obtain metal. A linkage between amber collection on the seashore and metal crafts may be a more widespread phenomenon. At the nearby Late Bronze Age coastal site of Trolldsting, co-occurrence of amber and metal casting indeed suggests such an economic linkage (Müller, 1919).

If pottery were acquired, this too would require some yet unidentified product in exchange. Local pottery is often produced by households with limited subsistence opportunities (e.g. poor soils) but with access to suitable clays. In such situations, pottery is produced in exchange for food. Perhaps Bjerre 7 produced a surplus of animals, cereals, oils, and/or metal objects? This would fit the logic of the DMP model. Although the goal is self-sufficiency, households become part-time specialists to obtain specific commodities that they cannot produce on their own. Pyrotechnology and special materials demand such exchanges, and the amber gathering fits this pattern. With a largely self-sufficient household, part-time specialization complements household independence.

ORGANIZING WORK: TASK AREAS

The second aspect of the DMP, which also characterizes Household Societies, consists of obtaining and organizing labour for self-sufficiency. Here we consider the tasks involved in subsistence, craft, and amber collection as illustrated by their distribution inside and outside the house and between activity areas.

Subsistence tasks

Plant macrofossils and ceramics from Bjerre 7 provide the best data for specific

subsistence tasks in distinct activity areas. The eastern end of the house was the primary cooking area, attested by macrofossils documenting the final processing and cooking of barley, wheat, and emmer or spelt. Most cereal grains of all species were found here, in fire pits N42, N49, and N64; N42 also contained chaff from barley and bread wheat. These pits also had abundant field-weed seeds from a final sieving. Sherds with encrusted food were recovered here, and eleven strainer sherds were found in the central cellar (N30).

At the western end of the house, by contrast, chaff of emmer or spelt concentrated in fire pits N149, N150, and N159 documented their dehusking, probably by crushing with mortars. Here thirty-five sherds representing three or four vessels for food preparation or cooking, and two ornamented body sherds, perhaps from serving vessels, were recovered. Thin-walled (< 4 mm thick) serving vessels were found concentrated in the western fire-pits. Perhaps some special activities involving food processing and eating took place here; unlike in the east, evidence of cooking is limited (few cereals).

Outside the house, despite much debris resulting from cleaning, a distinctive pattern exists. Although food-encrusted vessels were heavily concentrated south of the house, this concentration is probably owed to cleaning and not cooking tasks; because items difficult to clean (cereals and chaff) were rare here, cooking of cereals was evidently limited. However, many gold-of-pleasure seeds and two flax seeds were found here. Attesting to oil extraction, these seeds (which contain up to 40 per cent of oil) represent approximately seventy-five per cent of the total 276 seeds recovered, compared to only seven per cent for grains. We conclude that oil extraction was an outdoor activity, but cereal cooking was primarily an indoor activity.

Figure 8 shows that the distribution of ceramics probably documents mainly the disposal of refuse, but some patterning suggests cooking and serving activities. Within the house, pottery concentrations show a contrast between cooking vessels (foodcrusts) at the eastern end and serving vessels (thin-walled) at the west (see Supplementary Material). Just west of the house, food activities were documented from a refuse pit (N208) and area to the north (N191). The absence of cultivated cereals in N208 suggests little cooking; the pit contained 546 sherds weighing almost ten kilos, including an ornamented serving vessel, two ribbon-shaped handles from serving vessels, and possibly a lid. Feature N190, also north of N208, contained a smaller ornamented vessel, perhaps suggesting serving, and a bowl-like vessel with a rim diameter of *c.* 20 cm. A large, barrel-shaped storage container and a smaller vessel for pouring was found in N208 and N190. Thin-bodied serving vessels concentrate here. This distinctive assemblage suggests a place for special activities or disposal, perhaps related to festive meals.

Stone artefacts are hard to interpret as to function, but knives were probably used, at least partly, for butchering. Abundant burnt flint concentrated around fireplaces where such butchering and other activities are likely to have taken place. Hammerstones and crushing stones, perhaps used in preparing cereal and plant food, were concentrated outside, in the south-east, probably reflecting cleaning.

Overall, food-related activities dominated everyday life in the immediate surroundings of the farm. Some distinct activity areas exist, but interpretations are confounded by patterns of disposal. Food preparation and cooking concentrated at the eastern end of the house and preparation of oil outside the house. Serving

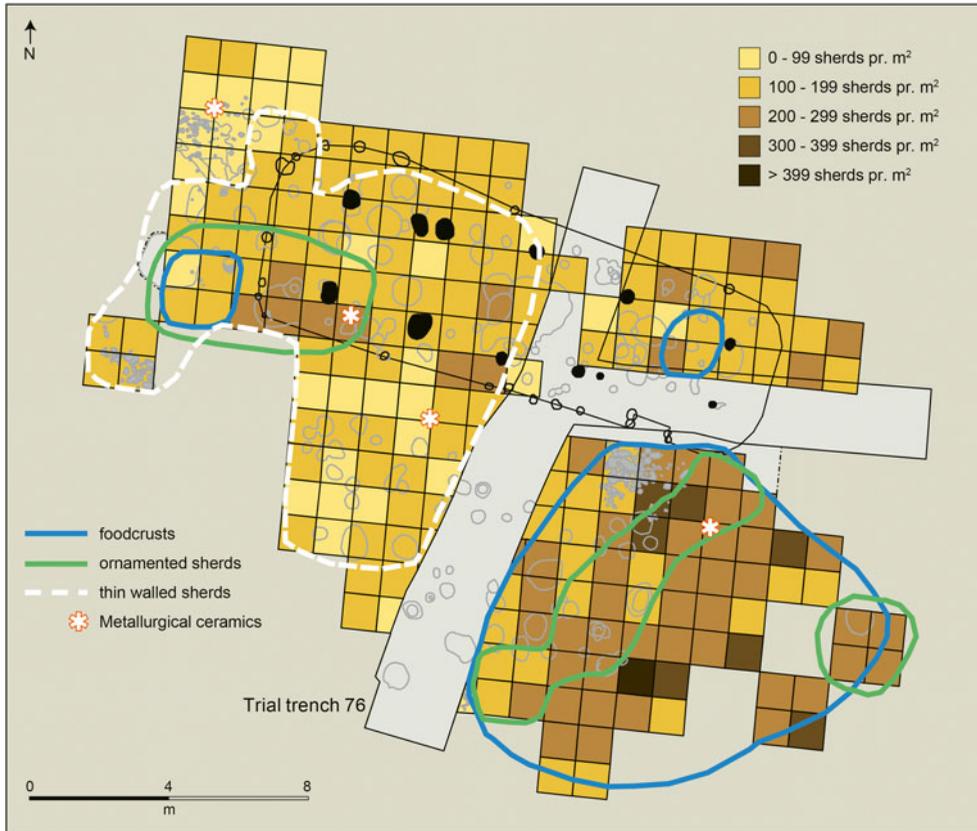


Figure 8. *Distribution of ceramics at Bjerre 7.*

vessels appear to be somewhat separated from primary cooking, in the western sector of the house and perhaps outside the house to the west.

Crafting

Used in diverse crafts, the lithics at Bjerre 7 are widely distributed, like the food tasks. Evidence of elementary tool manufacture is ubiquitous, often associated with fire. Burnt flint is quite abundant, often near fireplaces, especially outside to the south-east, associated with refuse disposal.

Tool production and use were expedient, without discrete work areas. Almost

all lithics (tools as well as debitage) are interpreted as waste from the manufacture of simple tools used once and discarded. The distributions of nodules, cores, flakes, and shatter suggest that flintknapping generally took place outdoors, especially south-east of the house. Some flintknapping was also undertaken inside the house (especially in the eastern end), where flint debris was routinely recovered. Knapping was broadly associated with general activity areas that included food processing and other tasks requiring cutting, scraping, and drilling.

Late Bronze Age flintknapping was executed as needed, for heavy work with food preparation, wood- and stone-working. The distributions and the presence of irregular

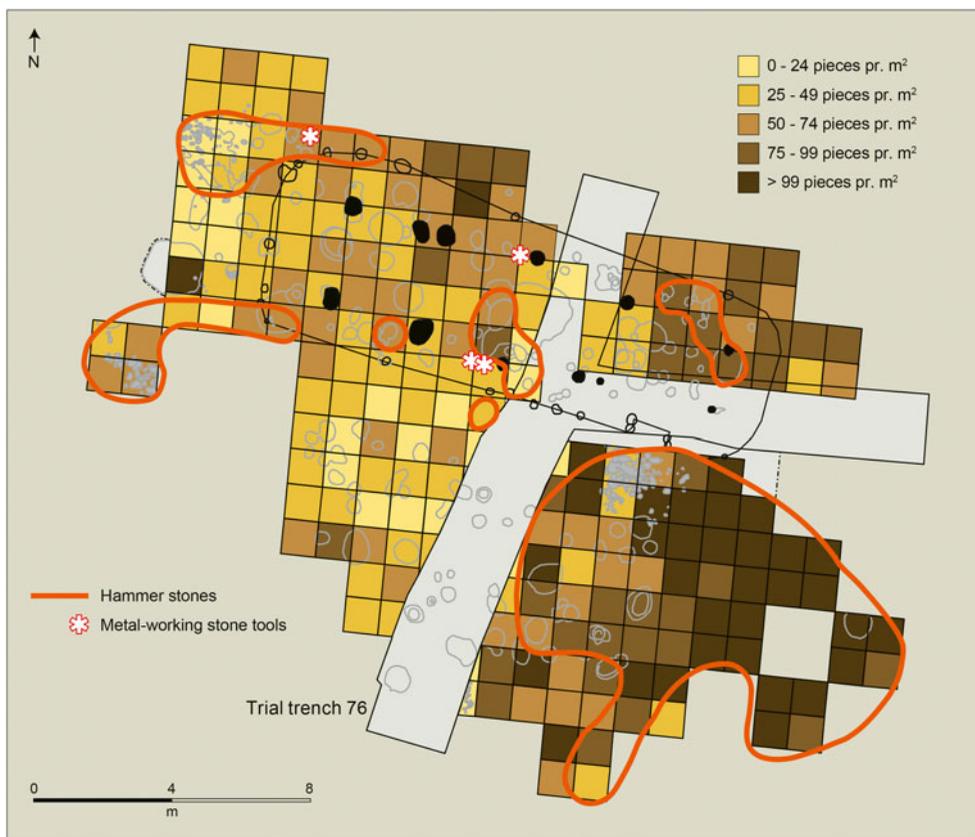


Figure 9. Distribution of lithic debitage and tools at Bjerre 7.

morphological types suggest that such activities were widespread. Scrapers are evenly spread in the house and outside, with a faint concentration in the exterior south-eastern area. Borers show a similar distribution. Sickles blades were found outside the house, primarily in the south-east, while large blade knives were also found outside the house, especially in the southern activity areas; two blade knives (one used as a sickle, the other to cut reeds) were located in the house at its eastern end, possibly as curated objects.

Although associated artefacts are few, the distribution of metal-making tools (crucible and mould fragments) outside the house is associated with intense fire (Figure 8), whereas the tools used for finishing the metal were found inside (Figure 9).

Amber handling

Figure 10 shows the spread of amber-related activities across the site. The distribution of amber in virtually all the units excavated in the occupation layer suggests that it formed part of everyday activities. Within the house, amber was concentrated in its western part, associated with many fire pits. We presume that this represents an area of primary sorting for storage and eventual exchange. A similar pattern was observed in the Early Bronze Age house of Bjerre 6 (Earle, 2018). Scattered outside, some western culture-layer units had high densities of amber not directly associated with storage; these may have been sorting locations possibly associated with a structure (Figure 2).

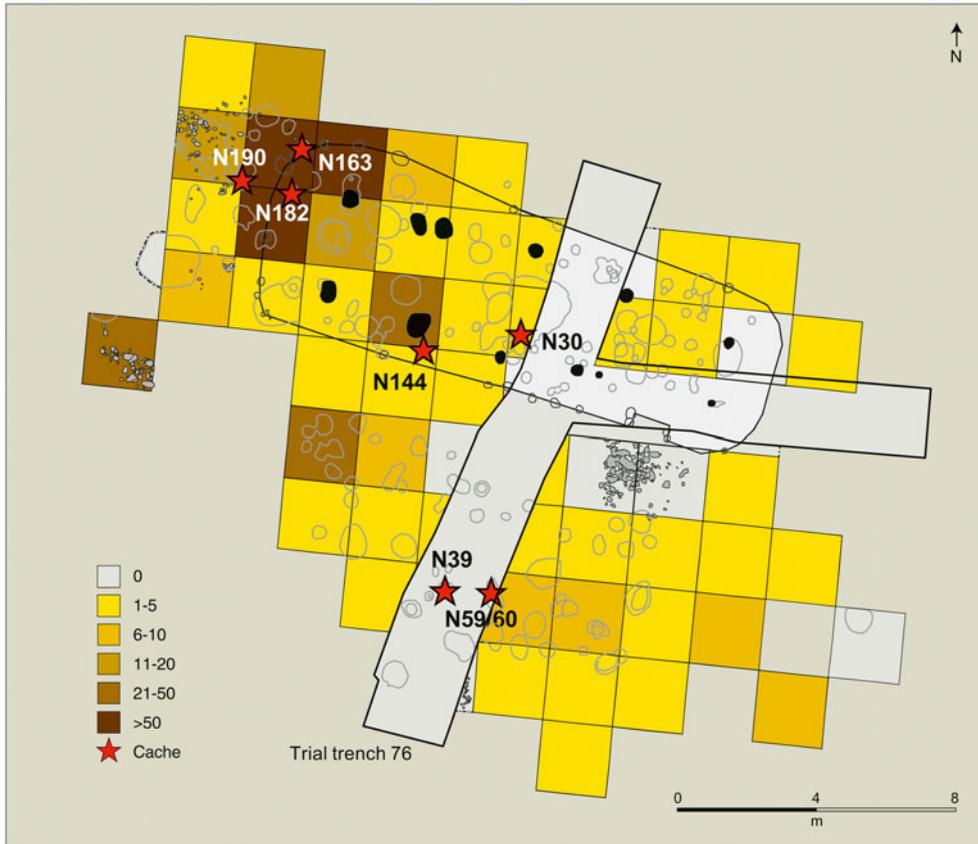


Figure 10. Distribution of amber indicating related storage features at Bjerre 7.

Storage caches were found close to, but somewhat removed from, general household activity spaces. A large amber storage pot (N163) was recovered at the extreme western end along the house wall and another cache was found nearby. Outside, N39 and N59 were somewhat removed from the primary activity. That amber storage was both inside and outside the house and that storage jars stood visibly above the ground surface suggests few security concerns.

Organizing tasks

How did the farmstead at Bjerre 7 obtain and organize its labour to maintain a high degree of self-sufficiency? The simplest explanation is that the farm had sufficient

labour for its tasks. Most tasks lacked strong patterning, despite good spatial data. Subsistence, tool manufacture, and amber handling were found inside and outside the house, suggesting considerable flexibility as people moved around according to conditions (e.g. rain, cold, wind) and needs; any distinction would be obscured partially by disposal patterns. The close association of tasks for food and lithic manufacture speaks in favour of such flexibility. Sorting and storage of amber was undertaken close to normal household tasks, and shows little concern for security. Finally, flexibility in carrying out tasks would decrease potential clashes in timing that could have created labour shortages.

Martin Mikkelsen (2020) describes how, across a spectrum of sizes and status, Bronze

Age farmsteads had features suggesting that two families occupied the ends of the houses or paired houses. He proposes that one of these families may have been unfree. At Bjerre 7, parallel feature areas existed at the eastern and western ends, which might support Mikkelsen's model. The artefact distributions, however, suggest that these distinctions could be more easily explained as a separation between cooking and other, cleaner activities, including eating and amber sorting, within a single family. Mikkelsen notes that Late Bronze Age houses became paired, the second house perhaps accommodating a servant family, but this was not found at Bjerre 7, possibly because the excavation area was limited.

CONCLUSIONS

We asked two questions at the beginning of this article: did the farm constitute a largely independent household responsible for meeting requirements of everyday life, and how were tasks organized within the household for self-sufficiency? In answer to the first question, the farm was indeed largely independent, with some engagement with local and long-distance exchange networks. Subsistence was supported by a mixed agropastoral economy: the household grew and processed cereals and some oil-containing crops, practised husbandry, and could rely on fishing.

As posited by the DMP model, some part-time specialization was embedded in the household as a means of obtaining a few outside commodities, but specialized activities were part of general household tasks. Amber gathering, perhaps opportunistically by men, women, and children, would have required only collecting by hand or with simple nets, as is still done today (Earle, 2018). Once gathered, amber was sorted and stored among other routine activities. The amber was not modified but probably

exchanged for the metal used in small-scale metallurgy. Simple metal products, perhaps sickles, axes, and decorative items, would have served the household, and small quantities may have been exchanged. Some exchange of goods and labour undoubtedly took place between neighbouring farms.

How were tasks organized within the household for self-sufficiency? The patterning we observed may raise more questions than it answers. As modelled by the DMP, division of labour characterizes most domestic units cross-culturally, and typical divisions, for example by gender and age, involve activities separated spatially. Bjerre 7 is divided into inside and outside spaces; the transition from the outside to the inside is marked by a zone with few activities: a paved entrance, and a cluster of four distinctive ceramics that may have had a ritual function. Some distinction exists between inside and outside activities, but this may be for pragmatic reasons, as between cereal *vs* oil processing, or finishing *vs* pyrotechnic metalworking.

Ceramic use in food and lithic production for butchering and tool manufacture were quite generalized and *ad hoc*, suggesting much flexibility. The collection and sorting of amber were combined with other activities. Farming was in established fields, probably near the house. Whatever the division of labour, we found no evidence that tasks were rigidly divided by gender roles (cf. Robin, 2013).

The patterning of features, artefacts, and macrofossils at Bjerre 7 does not support Mikkelsen's suggestion that Late Bronze Age houses with fire features at both ends generally incorporated two families living under the same roof. Living/working spaces existed at either end of the house, but with distinct zones for cooking, work, and eating. The house's better constructed part was at the west, where four substantial supporting posts and stronger walls defined an improved living space

away from the entrance and thus more private, compared to the eastern end, interpreted as the cooking space. In our opinion, Bjerre 7 did not accommodate separate families of different status at each end. Although slavery seems unlikely for this specific farm, the hypothesis must not be rejected out of hand.

In terms of the archaeology of Bronze Age farms, we emphasize the importance of detailed area excavations and inter-farm comparisons as a means to test economic and social hypotheses (Gröhn, 2004; Artursson, 2009). Despite the high cost of such excavations, this is feasible whenever occupation layers are preserved; even plough-soil excavation can provide good evidence at the household level (see Supplementary Material). We thus hope that future household research excavations will become routine parts of rescue work. The opportunity to evaluate socio-economic relations will benefit studies of household specialization (especially ceramics and metal), the divisions of labour, wealth differentials, and amber flows from coastal collecting sites to long-distance exchange networks.

SUPPLEMENTARY MATERIAL

To view supplementary material for this article please visit <https://doi.org/10.1017/ea.2021.63>.

ACKNOWLEDGMENTS

This work was supported by the United States' National Science Foundation under Grants DBS 9207082 and DBS 9116921; by the Danish Research Council for the Humanities under Grant 25-03-0520; the Danish Agency for Culture and Palaces under Grants 2003-3321/78701-0002 and -0008; Queen Margrethe II's Archaeological Foundation under Grants

13080-3 7/1998 and 10/2001; and by the German Research Foundation (DFG, Grant 2901391021-SFB 1266).

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La vie quotidienne à Bjerre 7, une ferme de l'âge du Bronze final à Thy au Danemark

Bjerre 7 est une modeste une ferme du Bronze Final située à Thy au Danemark. Son bon état de conservation et un relevé systématique des données ont permis aux auteurs de faire une étude exhaustive de l'autosuffisance de cette ferme, des échanges locaux et de la collecte d'ambre. La distribution de la céramique, du matériel lithique, des restes de plantes et de l'ambre permet d'identifier une série d'aires d'activités distinctes aux deux extrémités de la ferme, à l'intérieur et à l'extérieur. Les routines concernant le traitement des déchets, l'usage de la céramique au quotidien, le façonnage ponctuel et l'utilisation d'outils en silex et le stockage de l'ambre figurent parmi les sujets abordés. L'unité domestique était économiquement mixte et largement autosuffisante, avec peu de spécialisation. Les habitants de Bjerre, situé sur la côte de la Mer du Nord, récupéraient l'ambre qu'ils destinaient au commerce. Le métal, provenant de l'extérieur, servait à alimenter une industrie domestique à petite échelle. Bien qu'il faille compter sur une certaine division du travail, les activités relevées ne semblent pas démontrer une répartition rigoureuse des diverses tâches identifiées sur place. Translation by Madeleine Hummler

Mots clés: âge du Bronze final, Danemark, archéologie domestique, archéobotanie, ambre

Der Alltag auf der Fundstätte Bjerre 7, ein spätbronzezeitlicher Bauernhof in Thy, Dänemark

Bjerre 7 ist ein bescheidener spätbronzezeitlicher Siedlung in Thy in Dänemark. Sein exzellenter Erhaltungszustand und die systematische Datenerhebung der archäologischen Funde und Befunde ermöglichten es, die Selbstversorgung des Haushaltes, die lokalen Austauschnetzwerke und die Sammlung von Bernstein umfassend auszuwerten. Die Verbreitung der Keramik, der Steinartefakte, der pflanzlichen Makroreste und des Bernsteins zeigt, dass ein weites Spektrum von verschiedenen Tätigkeitszonen an beiden Enden des Hauses (innerhalb und außerhalb) vorhanden war. Unter den behandelten Themen werden die übliche Entsorgung des Abfalls, die Verwendung der Keramik im Alltag, die Bearbeitung und Nutzung von Silexgeräten je nach Bedarf, die Verarbeitung von Pflanzen und die Lagerung von Bernstein besprochen. Das Haus war ein wirtschaftlich allgemeiner Betrieb, wenig spezialisiert und weitgehend selbstversorgend. Die Lage der Siedlung an der Nordseeküste ermöglichte es, Bernstein zu sammeln, welcher für den Handel bestimmt war. Metall wurde für einen kleinen handwerklichen Betrieb durch Fremdhandel erhalten. Obwohl es wahrscheinlich eine Arbeitsteilung gab, deuten die verschiedenen Tätigkeitszonen eher auf eine Beteiligung des ganzen Haushaltes. Translation by Madeleine Hummler

Stichworte: Spätbronzezeit, Dänemark, Haushaltarchäologie, Archäobotanik, Bernstein