Domestic activities at the Linear Pottery site of Elsloo (Netherlands): a look from under the microscope

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Abstract:
Use-wear analysis of a sample of flint tools from the site of Elsloo, situated in the Graetheide cluster (NL), has shed light on the domestic activities carried out within the settlement. It was shown that hide processing predominates. The extent and character of the wear on the hide working implements indicates that different processing stages took place, including dehairing and currying. It is suggested that the quality of the end product, the processed hide, must have been very high. Other craft activities are woodworking and the task responsible for 'polish 23', possibly flax processing. A large number of sickle blades were found as well, displaying a considerable variation in polish attributes. A possible explanation is that different crops were harvested with the same sickle. Spatial analysis of the demonstrated activities has suggested that hide processing was concentrated in one area, possibly supporting the hypothesis that in addition to a domestic mode of production, a loose mode of production was practiced as well.

Keywords :
Linear pottery, microwear, hide processing, craft activities

1. Introduction and research questions

Much is known about the lithic assemblages of the Linear Pottery (LBK) communities living on the Graetheide Plateau, in the loess area of the southern Netherlands, as they have been extensively studied in terms of raw material selection (De Grooth 2008) and technology (De Grooth 1987 & 2007). Through the years well over a thousand LBK flint implements have been studied for the presence of traces of wear, only part of which was published (Van Gijn 1990; Verbaas and Van Gijn 2007). Unfortunately, the use-wear study of the flint material from Elsloo, performed in the context of several student theses at Leiden University (Flamman 1990; Schreurs 1988; Schallig 1995), was never published and the different studies were not integrated. This article attempts to remedy this.

A first aim was to examine the range of subsistence and craft activities conducted with flint implements at Elsloo and to see whether these activities were spatially structured across the settlement. Another question was whether there are differences between the Earlier (phases 1-3a) and the Later LBK (phases 3b-5) in terms of demonstrated activities. Lastly, two of the student theses (Flamman, 1990; Schallig, 1995) departed from the observations of De Grooth (1987) that there seemed to be evidence for ad hoc specialisation: in some houses more flint was worked and it was knapped in a relatively efficient way. The question was whether the focus on flint knapping evident in some houses, had consequences for the other tasks carried out in the household.

2. The site of Elsloo and Elsloo-Riviusstraat

Elsloo-Koolweg was excavated between 1958 and 1966 by Modderman, using heavy machinery to expose large areas of the settlement (Modderman 1970). It is estimated that the site covers c. 10 ha, about one third of which was excavated at the time of the Modderman excavation. Many of the pits were not completely excavated at the time. De Grooth estimates that only 5-10 % at the most of the original find material has been retrieved (De Grooth 1987, p. 29). A total of 95 houses were revealed at the time.
Recently, additional sectors of the settlement have been excavated by Van Wijk, amongst which Elsloo-Riviusstraat (Van Wijk 2002; Porreij 2009). Elsloo-Riviusstraat lies just beside Elsloo-Koolweg and provided further insight into the internal structure and development of the settlement. A total of 1400 m2 was exposed, revealing five additional house structures. Two of them have a configuration which is typical of the Earlier LBK, while the other structures present too few remains to be assigned to a particular house-type. Detailed analysis of the pottery has, however, shown that all of the houses can be dated to the Earlier LBK (Van Wijk *et al.* 2009). About twenty pits were revealed as well. These can be subdivided in silos, clay extraction pits and refuse pits. Some of them seem to be part of a pit complex. Moreover, the remains seem to indicate the presence of a system of ditches (Van Wijk 2007).
The site of Elsloo could be internally divided into several different wards, or house groups. Each ward consisted of one large tripartite longhouse and a number of smaller houses. There are strong indications that these wards were occupied for long periods (De Grooth and Van de Velde 2005). Each house was considered to have its own activities area, of about 12 m of radius around the structure.

3. The flint assemblage: evidence for *ad-hoc* specialisation?

The flint assemblage of Elsloo has been typologically described in great detail by Newell (Newell 1970). It is characterized by a blade technology and comprises all the typical LBK types of tools like endscrapers, LBK points, *quartiers d'orange*, borers, as well as retouched flakes and blades. No attempt has been made to link the typological counts to our use-wear results, as the objective of the use-wear study was not to evaluate the functional homogeneity of the different types[1] but to study domestic activities.
De Grooth has examined the organisation of flint tool manufacture at Elsloo (De Grooth 1987). Her analysis of the materials found in the rubbish pits around the different houses is based on the assumption that the contents of the lateral pits contain the refuse of the house they are situated besides and as such reflect the activities taking part in the house in question. The results indicate that manufacturing waste, such as cores and rejuvenation pieces, is always present, even when there is little evidence for flint knapping in the house (that is, only few lithic remains were recovered). This suggests that lithic production in Elsloo followed principally a *domestic mode* of production: every household produced its own flint tools on the basis of its need, and all the different phases of manufacturing sequence were carried out in each house and in its surrounding areas. However, even though this production mode seems to prevail, statistical analysis using Principal Component Analysis, suggests that members of some households probably operated as ad hoc specialists: lithic remains in the pits belonging to these houses are characterized

1 The functional homogeneity of LBK flint types was addressed in detail in Van Gijn 1990.

by a relatively large amount of waste material, concentrated in a small area, and a relative scarcity of blanks and finished tools. Those specialists probably produced a surplus of blanks and tools that were subsequently taken away from the house, to be used by other households (De Grooth 1987).

4. Sampling and methodology

With respect to the 'old' Elsloo excavation by Modderman the principal units of sampling were the individual houses. Here fifteen houses were selected, seven from the Earlier LBK (houses 4, 8, 17, 19, 20, 32 and 49) and eight from the Later LBK (houses 9, 12, 23, 79, 85, 91, 92 and 94). All retouched implements from the pits attributed to these houses were examined microscopically, as well as all blades and flakes with a regular edge longer than 2 cm or a pointed tip (see Van Gijn 1990 for selection criteria).

This resulted in a total of 404 examined artefacts, 237 of which displayed traces of use (tab. 1). The sampling strategy for the flint material from Riviusstraat was a little different: all retouched implements were examined and a weighted sample was taken from the unretouched ones. In total, of the 276 artefacts retrieved, 92 were examined, 78 of which showed interpretable traces (tab. 1). The houses from which the material derived are nrs. 96, 97, 98, 99 and 100, all of them attributed to the Older LBK. The pits from which flint material was studied are depicted in figure 1. Cleaning methods of the material from the Modderman excavation followed the Keeley method: artefacts were immersed in a 10% HCl solution, subsequently rinsed, and then subjected to a bath in a 20% KOH solution. The material

Fig. 1. *Plan of the site of Elsloo and Elsloo Riviusstraat, showing the pits from which the flint implements were studied.*

	analyzed	*traces*	*traces*	*no traces/not intepr.*	*no traces/not intepr.*
House n°	***N***	***N***	***%***	***N***	***%***
4	**107**	**64**	**59,8**	**43**	**40,2**
8	**62**	**34**	**54,8**	**28**	**45,2**
9	**47**	**30**	**63,8**	**17**	**36,2**
12	**31**	**19**	**61,3**	**12**	**38,7**
17	6	2	33,3	4	66,7
19	7	5	71,4	2	28,6
20	9	7	77,8	2	22,2
23	*10*	*5*	*50,0*	*5*	*50,0*
32	26	15	57,7	11	42,3
49	*43*	*23*	*53,5*	*20*	*46,5*
79	8	5	62,5	3	37,5
85	7	5	71,4	2	28,6
91	6	5	83,3	1	16,7
92	33	18	54,4	15	45,5
94	2	-	-	2	100
96	52	44	84,6	8	15,4
97	1	1	100	-	-
98	19	17	89,5	2	10,5
99	16	12	75	4	25,0
100	4	3	75	1	25,0
tot	496	314	63,3	182	36,7

Tab. 1. *Overview of the number of flint artefacts studied and number of implements with traces listed per house. In* **bold** *are listed the house numbers having a high factor score in the Principal Component Analysis, possibly indicative of a loose mode of production, in italics the ones with a low factor score.*

from Elsloo Riviusstraat was not chemically cleaned. In order to remove finger grease all artefacts were regularly cleaned with alcohol. Use was made of a Nikon metallographic microscope with magnifications ranging from 50-560 x with Nomarski DIC and a Wild stereomicroscope. Photographs were made with a Nikon DXM1200 and a Nikon digital sight camera, using Helicon Focus.

5. Inferred activities and domestic life

5.1 Crafting activities

Hide working

Hide working is the most frequently represented activity as half of the tools with use wear traces proved to have been used for this (50,9 %) (tab.2). Use-wear and experimental data, indicate that all the different stages of hide processing – such as cleaning, dehairing and tanning – took place inside the settlement. This could be inferred from the great variation in 'hide polishes' (fig. 2e-g). This would suggest that LBK people had sophisticated knowledge about hide processing. The fact that we also have cutting and boring tools with traces from contact with hide indicates that hide was transformed into clothing or other objects. Maybe hide was also related to the construction of the domestic space itself, namely to create smaller compartments in the larger houses. However, the percentage of hide-scrapers in Elsloo is, in comparison to the number of hide scrapers in other cultural contexts, still very high and a focus on hide-based crafts does not seem to fully account for this. We suggest that this high frequency of hide working tools can be explained in terms of LBK hide processing techniques, rather than in an extensive hide-based material culture. Ethno-archaeological research on hide processing with stone scrapers in Ethiopia (Gallagher 1977) showed that thinning and currying hides rapidly dulls the tool's edges. Many of the LBK scrapers are broken in the haft, creating a characteristic

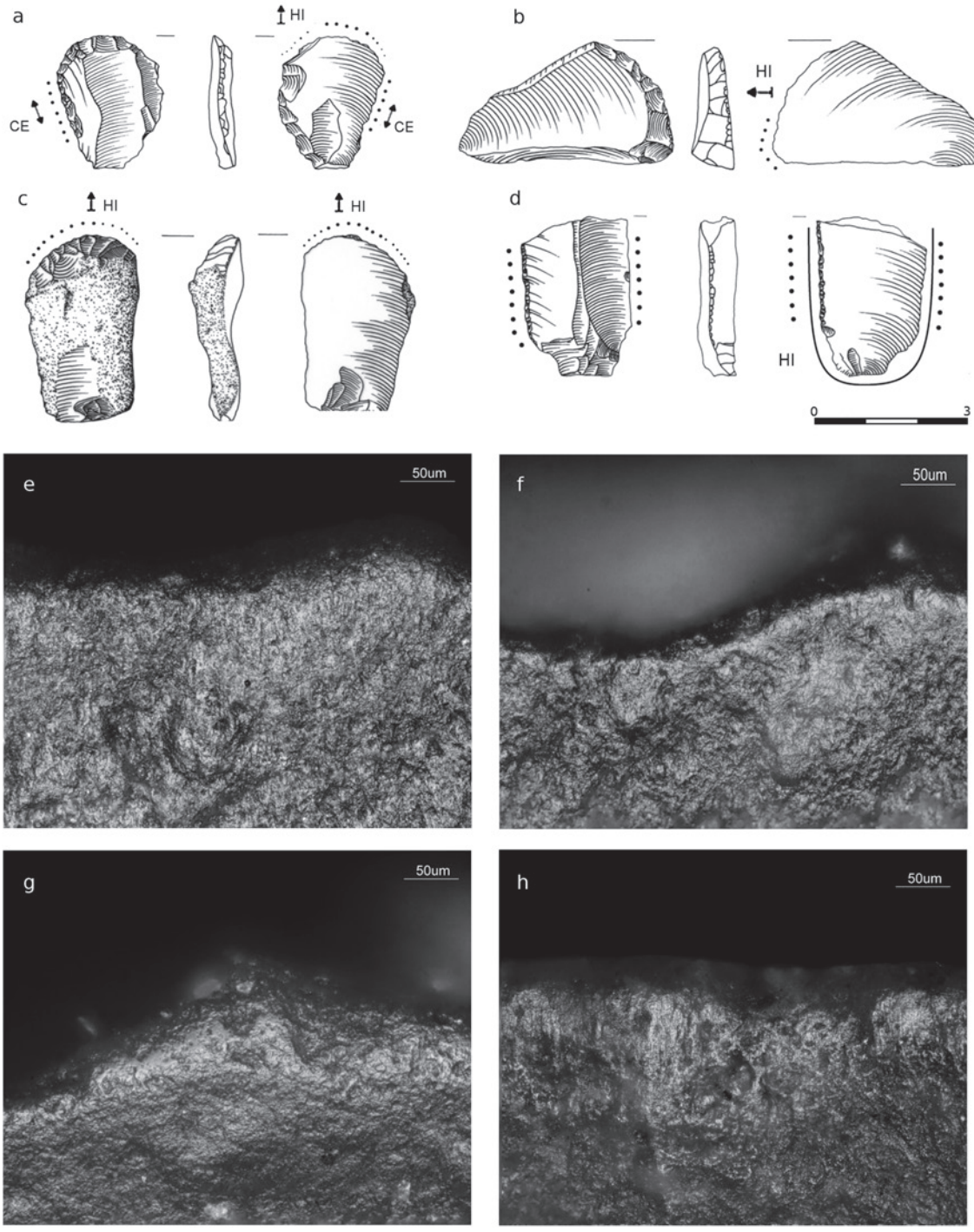

Fig. 2. *Scrapers displaying traces from hide working and a blade fragment which was broken in a haft fitted with raw hide. Note the variation in polish attributes from contact with hide (photographs Laboratory for Artefact Studies, Leiden University).*

bent fracture (fig. 2d). This indicates that quite a lot of force may have been exerted. These hafted segments also show hide polish (fig. 2h), suggesting the use of hide in the hafting arrangement. Many scrapers are relatively short due to recurrent re-sharpening, reflecting an intensive use life. We suggest that the large number of scrapers and the intensity and force with which they were used are the result of currying in order to make the skins very soft and supple. Moreover, some of the extensively rounded hide scrapers closely match experimental dehairing tools in terms of their wear attributes. Possibly the LBK people were therefore producing leather. The need for

hide working implements seems to have been high, as occasionally, hide scrapers were made by re-tooling other instruments already extensively used for other activities (especially sickle blades) (fig. 2a).

Wood working

Wood working also occupied a prominent position among crafting activities at Elsloo (10,6 %) (tab. 2). Wood is not only an essential raw material for house construction, but also for making a large variety of domestic objects, like hafts and other implements necessary for daily activities. However, no specialized wood working tools are present. For the most part large unmodified flakes were used for scraping and planing, occasionally also for cutting. Blades have been employed to cut or incise wood, borers for drilling. End-scrapers are only in few cases connected to wood working, being almost exclusively associated with hide working. Wood working tools thus constitute a broad category, involved in a great variety of specific tasks. In fact, traces from contact with wood show some variability in the degree of development, the degree of linkage and the specific texture and reflectivity. This is related to the state of the worked material, its freshness and properties and indicates that wood working entailed a variety of tasks.

Bone and antler working

Bone and antler are versatile raw materials that could be used to make a variety of tools, including hafts. In Elsloo few bone and antler working tools have been encountered (4 % of the used tools). Nevertheless different actions are represented such as grooving, scraping, boring and piercing. Unretouched blades and flakes constituted the principal tool types for this craft activity.

'Polish 23'

'Polish 23' is a distinctive type of wear traces that has puzzled use-wear analysts for decades (Caspar *et al.* 2005; Keeley 1977; Sliva and Keeley 1994; Van Gijn 1990). It is characterized by a two-sided polish: one side displays a rough and matt polish with numerous perpendicularly oriented striations, whereas the other aspect has a smooth and linked aspect with hardly any striations (fig. 3e, f). The edge is extensively rounded and edge removals never occur. The motion executed is strictly perpendicular. It is beyond doubt that the two polishes are due to one and the same action as they merge on the very edge of the tool. It has been observed on *quartiers d'orange*, blocky elongated implements with a triangular cross-section displaying an unretouched blunt angled edge of 70-90 degrees (Cahen *et al.*, 1986, fig. 16; Jadin, 2003, fig. 5-1-40; Van Gijn 1990, fig. 48). There is however quite a range of tool types involved in the activity causing 'polish 23', notably obtusely angled blades (fig. 3a-d). Almost every obtusely angled regular unretouched edge found in Dutch LBK sites displays 'polish 23', but their number is never very high, ranging between 2-4 % (Van Gijn 1990; Verbaas and Van Gijn 2007).

Over the years many experiments were carried out to attempt to replicate these enigmatic traces. The

Contact/Motion	*borpierc*	*%*	*diag*	*%*	*dynam*	*%*	*haft*	*%*	*long*	*%*	*trans*	*%*	*uns*	*%*	*tot*	*%*
bone & antler	2	*0,4*	1	*0,2*	-	-	2	*0,4*	3	*0,7*	3	*0,7*	7	*1,5*	18	***4,0***
hide	5	*1,1*	1	*0,2*	-	-	14	*3,1*	62	*13,7*	109	*24,1*	39	*8,6*	230	***50,9***
butchering	-	-	-	-	1	*0,2*	-	-	11	*2,4*	-	-	1	*0,2*	13	***2,9***
cereal	-	-	1	*0,2*	-	-	-	-	34	*7,5*	2	*0,4*	1	*0,2*	38	***8,4***
wood	2	*0,4*	-	-	1	*0,2*	2	*0,4*	18	*4,0*	20	*4,4*	5	*1,1*	48	***10,6***
soft plant	-	-	1	*0,2*	-	-	-	-	5	*1,1*	-	-	-	-	6	***1,3***
polish '23'	-	-	-	-	-	-	-	-	-	-	10	*2,2*	1	*0,2*	11	***2,4***
polish '10'	-	-	2	*0,4*	-	-	1	*0,2*	1	*0,2*	8	*1,8*	1	*0,2*	13	***2,9***
hard mat	1	*0,2*	-	-	1	*0,2*	-	-	5	*1,1*	7	*1,5*	5	*1,1*	19	***4,2***
soft mat	-	-	2	*0,4*	3	*0,7*	-	-	1	*0,2*	2	*0,4*	2	*0,4*	10	***2,2***
uns	2	*0,4*	-	-	4	*0,9*	25	*5,5*	2	*0,4*	3	*0,7*	10	*2,2*	46	***10,2***
tot	**12**	***2,7***	**8**	***1,8***	**10**	***2,2***	**44**	***9,7***	**142**	***31,4***	**164**	***36,3***	**72**	***15,9***	**452**	***100,0***

Tab. 2. *Overview of the results of the use-wear study of flint from Elsloo and Elsloo Riviusstraat: contact material versus motion (figures indicate used zones, not individual artefacts as a tool can display more than one used zone). From left to right: boring; diagonal; dynamic (pounding, shooting); hafting; longitudinal; transverse; unsure.*

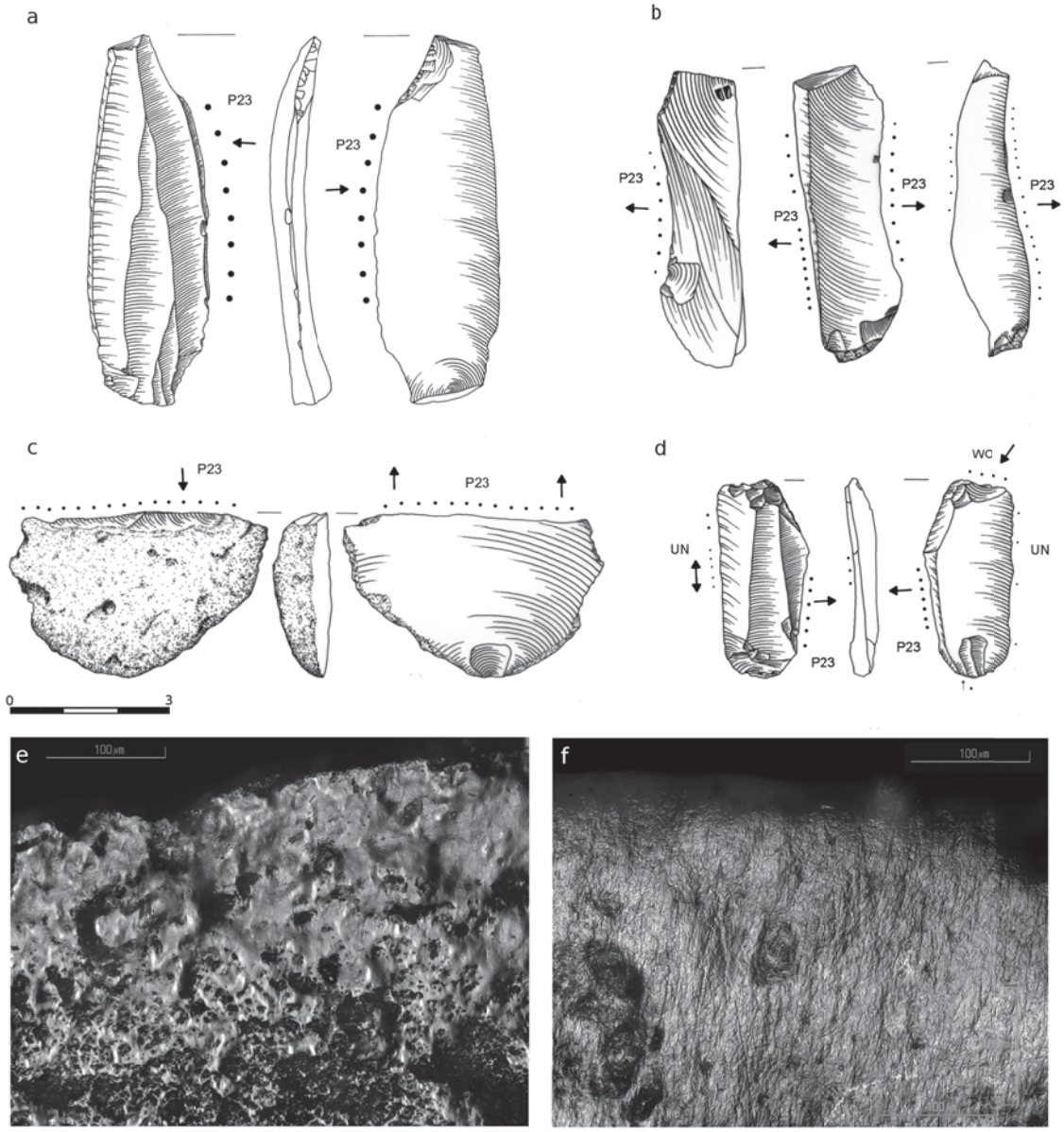

Fig. 3. *The range of blunt edged, unretouched flint tools displaying 'polish 23'. The photographs show the enormous difference in polish features between the two aspects of one and the same tool (drawings R. Timmermans ; photographs Laboratory for Artefact Studies, Leiden University).*

motion is certainly perpendicular and the contact material must be at the same time very soft - so not to cause any edge removals -, very abrasive - in order to cause the extensive edge rounding and numerous striations -, yet keeping its shape - because the length of the zone of contact never exceeds 2-3 cm. Experiments have been done with hide strips, bark, and various plant fibres. The most likely candidate is flax, a crop grown during LBK times (Bakels and Zeiler 2005). Over the years a series of experiments was carried out obtaining flax fibres without applying the historically documented retting process (De Wilde 1984). The flax stems were harvested by uprooting as the stems are too strong to be cut with a blade. They were then dried for a few days. After that the stems were briefly pounded with a hammerstone whereupon a *quartier* or other blunt edged tool was used to scrape off the woody stem fragments from the fibres (fig. 4). The fibres were much stronger than those obtained by retting and also retained a beautiful shiny golden colour, contrasting with

Fig. 4. *Experiment with scraping unretted flax with a blunt edged quartier (photograph A.L. van Gijn).*

the dull and grey tint of the retted flax fibres. The steeply angled, unretouched working edge was highly effective for this task. The process was, admittedly, very time-consuming, but could easily be done as an embedded activity, while overseeing the cooking or minding the children. The resulting wear traces very closely match the rough aspect of the archaeological *quartiers*, but the smooth aspect has not yet been fully replicated (Van Gijn 2010, p. 85-88). This may be due to the angle of contact or to the state of dryness of the stems and further experimentation should shed light on this.

5.2 Subsistence activities

Cereal harvesting

Quite a number of sickle blades were retrieved in Elsloo (8,4 %) (tab. 2). Macroscopically visible gloss was found on different types of tools, blades, blade fragments, flakes and even scrapers (fig. 2a, 5). They vary greatly in size and shape. They are intensively used and show an extremely developed lustre, indicating prolonged and intensive usage (fig. 6a-e). The longitudinal or slightly oblique orientation of the sickle gloss indicates that the flint tools were probably inserted in the haft forming a serrated edge. They were often re-sharpened and there is evidence for re-tooling. For example, the scraper depicted in figure 2a was first used as a sickle and was then subsequently used as hide scraper.

The polish of the sickle blades varies considerably in that on some tools the abrasive component in the use-wear, such as striations, pits, corrosions, a rough texture, is considerable (fig. 6e). The polish on others is extremely smooth and highly linked (fig. 6a). It has been proposed that the abrasive traces could be due to the presence of weeds infesting the cereal field (Juel Jensen 1988) but experiments by the first author do not support this (Van Gijn 1990). Other scholars explain this variability in terms of the harvesting technique employed, considering the possibility of repeated contact with soil and the minerals particles contained in it, cutting the straws directly on the ground (Clemente and Gibaja 1998). It is also possible that the sickles were used to reap different crops and that different 'mixtures' of vegetal contact materials are responsible for the variation in polishes.

Butchering

Use-wear traces from meat cutting and butchering are severely underrepresented in archaeological contexts (Van Gijn 1990, p. 33). Such traces are very prone to post-depositional processes but are nevertheless occasionally encountered on well

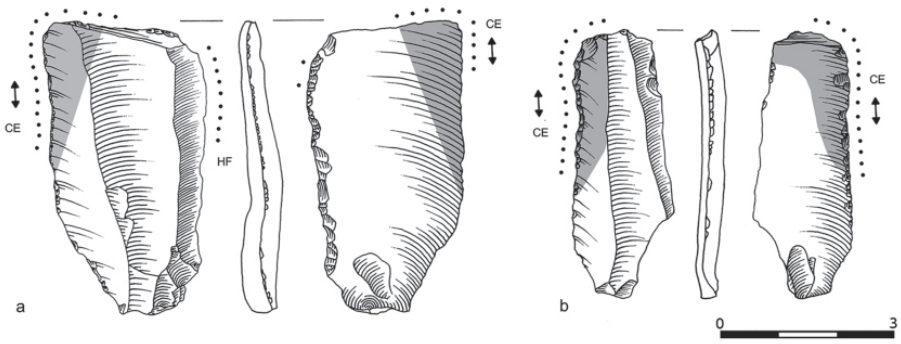

Fig. 5. *Two of the sickle blades found at Elsloo (drawings R. Timmermans).*

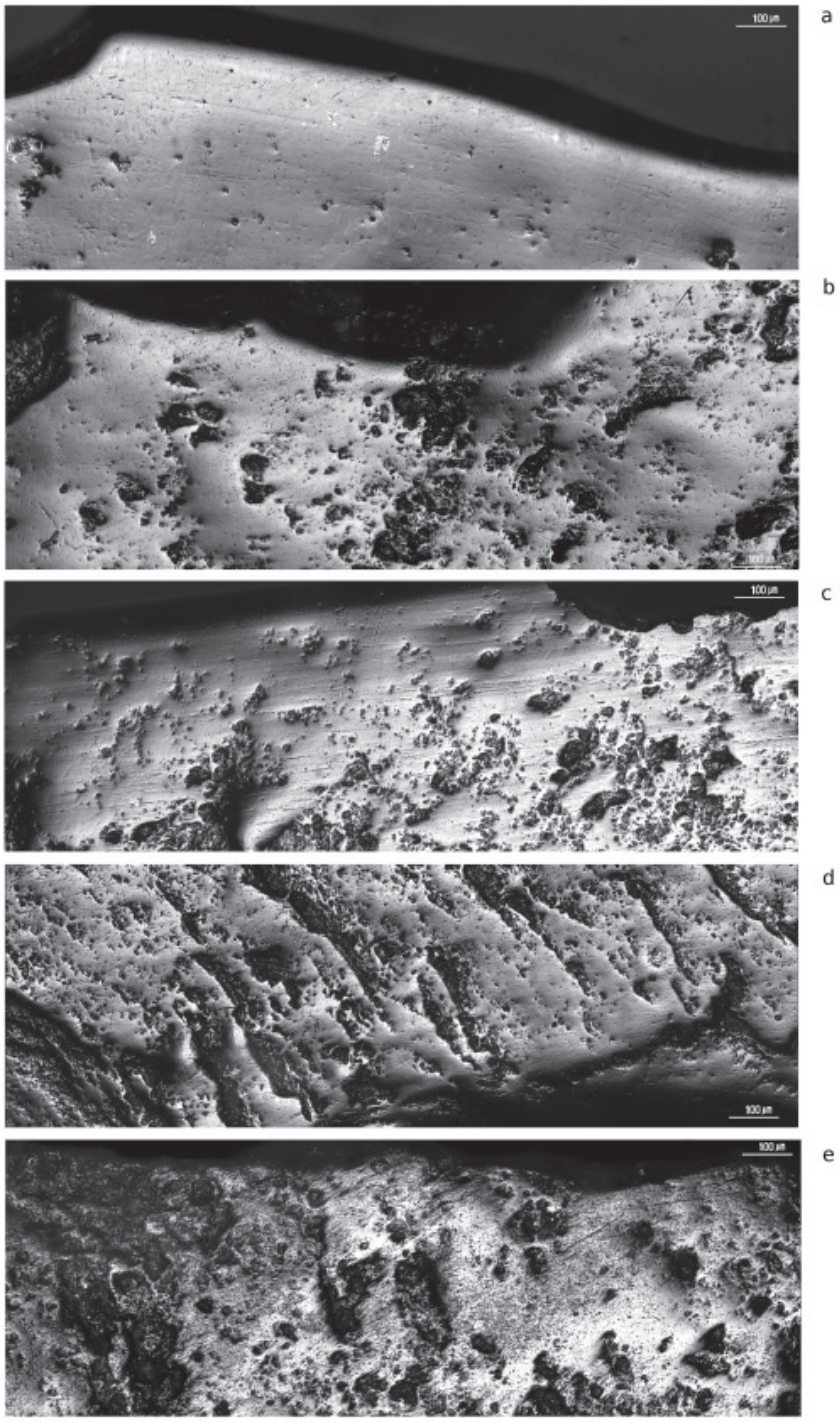

Fig. 6. *The variation in sickle gloss between different sickle blades in terms of degree of linkage, texture and striations (photographs Laboratory for Artefact Study, Leiden University).*

preserved implements. In Elsloo only a few tools display traces attributable to butchering (2,9 %). This low percentage is remarkable considering the great quantity of animal skins that have been processed. Both blades and flakes seem to have been employed.

5.3 Unspecified wear traces

Polish '10' is, just like the infamous polish '23', a type of wear which is reasonably well defined in terms of its characteristics (Schreurs 1992), but which has not yet been replicated (fig. 7). The wear traces include extensive rounding, a matt relatively rough polish which nevertheless also

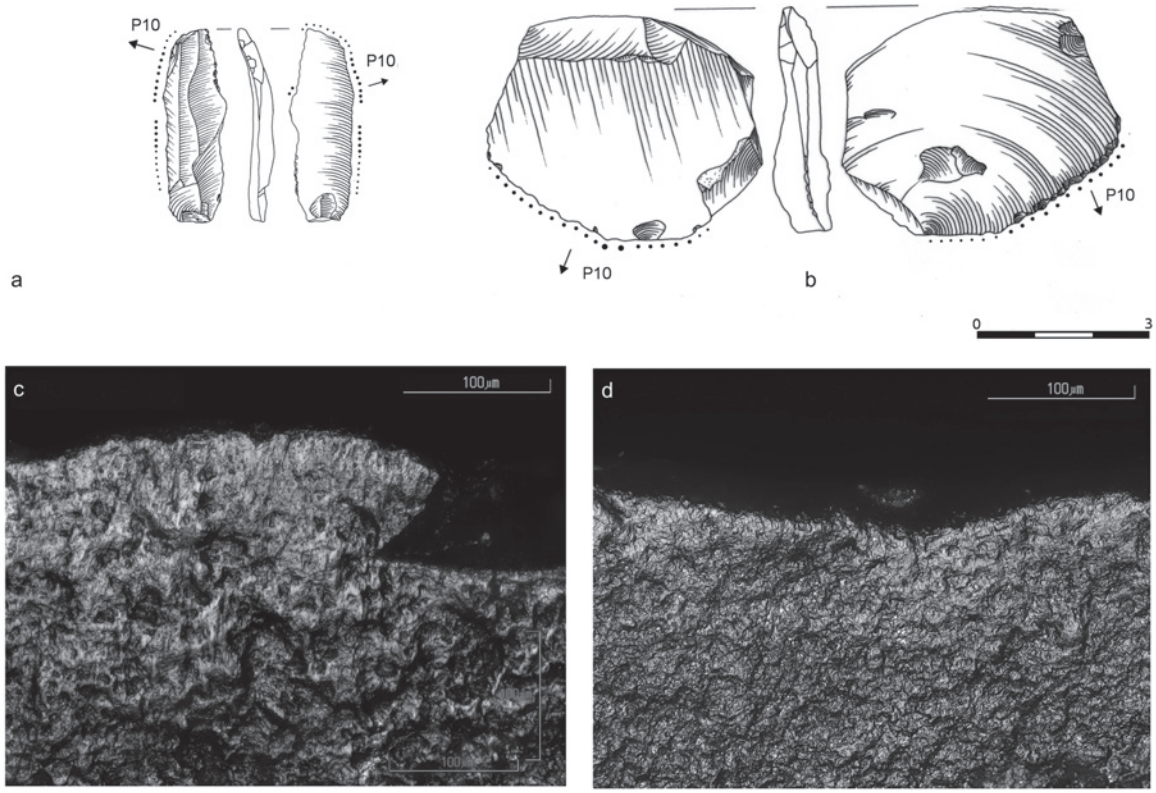

Fig. 7. *Implements with polish '10' and wear traces observed (drawings R. Timmermans; photographs Laboratory for Artefact Study, Leiden University).*

displays smooth parts and an absence of edge removals. The contact material involved was worked both in a longitudinal and a transverse motion. Consequently, the range of tools on which these traces are observed, varies considerably.
Last, there are a number of tools with traces that could not further be specified. Ten implements displayed traces from contact with soft, non-silicious plants, nineteen artefacts were used on an unknown hard material and ten on an unknown soft material. Last there were those tools on which traces of wear seemed to be present, but it was not sure whether these were due to the use of the tool.

6. Spatial differentiation and the evidence for a loose mode of production

For the spatial analysis of the functional data we made use of MapInfo Pro 7.0. We believe that the selection of houses and pits (fig. 1) is large enough to obtain insight into spatial differentiation in flint use and discard, even though the complete settlement is not covered and only few large houses were incorporated into the study. Emphasis was on hide processing and other craft activities, as well as on the distribution of the sickle blades. Unspecified contact materials have been excluded from this part of the analysis.
As already stated above, hide working is the most frequently represented activity. Hide processing tools were encountered in almost all of the analyzed pits, suggesting that this activity was part of the everyday life of each household. Dry and fresh hide working tools can be found in all examined pits, suggesting that the entire hide processing process was realized in all domestic spaces. This kind of homogeneous distribution seems to reflect a domestic mode of production, in which every household produced independently on the basis of its own needs.

However, there is a considerably difference in the quantity of hide scrapers – and thus in the quantity and quality of hide working – from one household

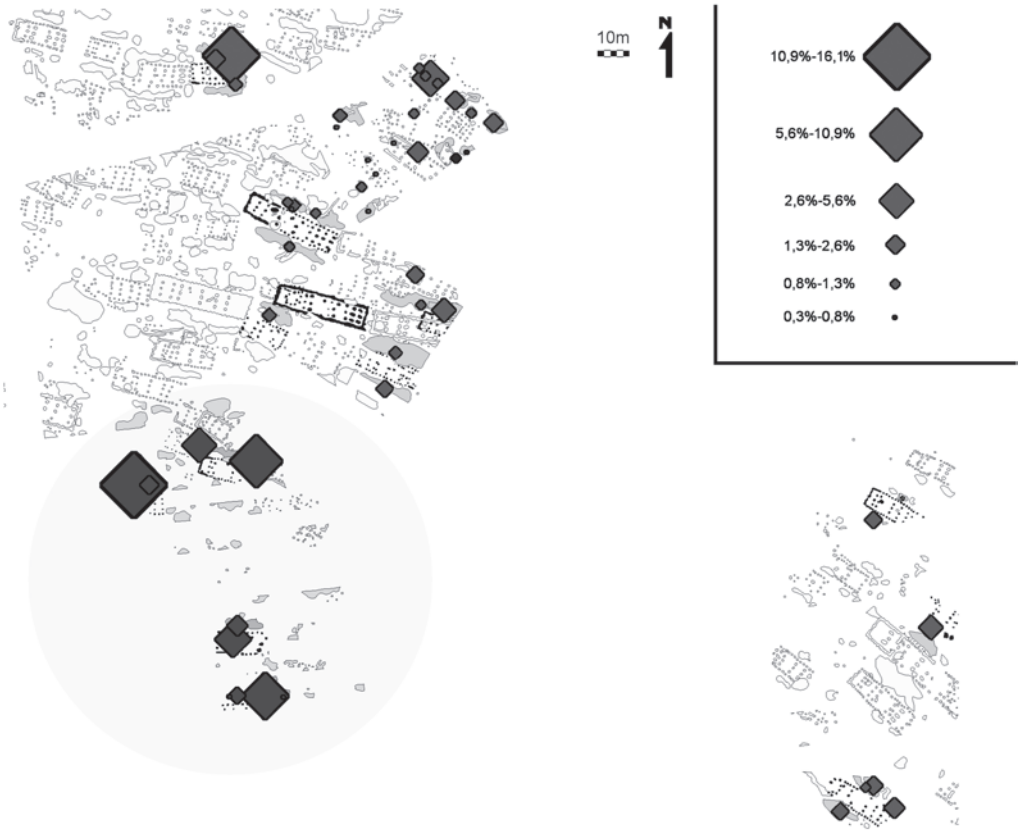

Fig. 8. *Location of the concentration of hide processing tools around the area of houses 4, 8, 9 and 12 (N. Mazzucco).*

to another. Concentrations of hide working tools are seen in one specific area of the settlement (fig. 8). It is interesting to note that the houses in this area (nrs. 4, 8, 9 and 12) all had high factor scores in the Principal Component Analysis (De Grooth 1987, *pers. comm.*). These high factor scores indicate the houses in which a relatively large amount of flint was efficiently knapped, possibly for the benefit of the entire settlement. It is remarkable that this same area also seems to be the centre for various other activities, like wood working and butchering. In fact, no less than 47,8 % of the used flint implements derives from these four houses. It is interesting to note also that this concentration

House n°	*4*	*8*	*17*	*19*	*20*	*23*	*32*	*49*	*96*	*97*	*98*	*99*	*100*	*tot %*
phase	*1*	*3a*	*1*	*1*	*1*	*1*	*1*	*3a*	*1b-1c*	*1c*	*1d*	*2a-2b*	*1c*	
bone & antler	0,9	1,2	0,3	0,9	0,9	-	0,3	-	-	-	-	-	-	4,4
hide	**7,9**	**12,3**	0,6	1,5	1,8	1,2	2,3	**10,3**	**6,2**	-	0,9	1,8	1,5	48,1
butchering	**3,8**	-	-	-	-	-	-	-	-	-	-	-	-	3,8
cereal	**2,1**	0,9	-	-	-	-	0,6	0,9	**2,6**	0,3	1,8	0,3	-	9,4
wood	**5,6**	**2,6**	-	-	-	-	-	-	0,3	-	1,5	0,6	0,6	11,1
soft plant	0,3	-	-	-	-	-	0,3	-	-	-	-	-	-	0,6
polish '23'	0,3	0,3	-	-	-	-	0,3	0,9	0,3	-	-	-	-	2,1
polish '10'	**2,9**	-	-	-	-	-	-	0,6	0,3	-	-	-	-	3,8
hard mat	0,3	0,3	-	0,3	0,3	-	1,2	0,6	0,3	-	0,3	0,3	-	3,9
soft mat	0,6	0,3	-	-	-	-	-	-	-	-	0,6	0,6	-	2,1
uns	3,5	0,6	-	0,6	0,3	0,3	0,9	0,3	3,5	-	0,3	-	0,4	10,7
tot %	**28,2**	**18,5**	0,9	3,2	3,2	1,5	5,9	**13,5**	**13,5**	0,3	5,3	3,5	2,6	100

Tab. 3. *Older LBK: inferred activities per house, indicated in terms of used zones. In bold the highest values for each relevant activity are indicated.*

House n°	*9*	*12*	*23*	*79*	*85*	*91*	*92*	*tot %*
phase	*5*	*5*	*4*	*5*	*5*	*5*	*5*	
bone & antler	-	-	-	1,8	-	-	0,9	2,7
hide	**22,7**	**10,9**	3,6	3,6	5,5	0,9	**11,8**	59,1
cereal	1,8	0,9	-	-	-	0,9	1,8	5,5
wood	**4,5**	1,8	-	-	-	0,9	1,8	9,1
soft plant	0,9	0,9	-	-	-	0,9	-	2,7
hard mat	0,9	0,9	-	-	0,9	-	2,7	5,5
soft mat	**1,8**	0,9	-	-	-	-	-	2,7
polish '23'	-	0,9	-	-	-	**2,7**	-	3,6
unsure	0,9	0,9	0,9	0,9	-	0,9	4,5	9,1
tot %	**33,6**	**8,2**	4,5	6,4	6,4	7,3	**23,6**	100

Tab. 4. *Younger LBK: inferred activities per house, indicated in terms of used zones. In bold the highest values for each relevant activity are indicated.*

of activities seems to be constant through time. Houses 4 and 8 date to the Earlier LBK, houses 9 and 12 to the Later phase. This indicates that in Elsloo there seems to have been at least one area where a broad variety of crafting and productive activities was carried out, including flint knapping. This surplus production most likely was not only intended for the producing households, but may have been redistributed to the other households. In this sense the spatial analysis is in support of the principal component analysis of the flint material carried out by De Grooth (1987). However, such a correlation could not be demonstrated in all houses. High concentrations of hide working implements have also been found in house 49 and 92, which had low factor scores (tab. 3 and 4). Both of these houses are rather far removed from the area with houses 4, 8, 9 and 12 and may thus represent another centre for craft activities, although the variety in activities is less than in the ones with high scores.

The distribution of the sickle blades seems to be quite homogeneous. This suggests that the sickles were part of the domestic toolkit of each household and were re-shaped, re-tooled and finally discarded within the area of the house. Nevertheless, it is likely that the agricultural process was a communal affair.
The sporadic antler and bone working tools are represented in a small number of houses located all over the settlement. 'Polish 23' and soft plant working tools also show no spatial concentrations. Their presence is attested for in only a limited number of houses, always in small numbers (tab. 3 and 4).

7. Chronological differentiation

One important question was whether there were differences between the Earlier and the Later LBK in terms of the activities represented. In the Earlier LBK a greater variety of activities is represented as butchering implements and tools with 'polish 10' are lacking in the Later LBK (tab.5). It must be stressed however that this could also be due to the larger number of implements that were studied from the Earlier LBK, making the chance that rare traces of use appear in the results substantially larger. The most notable difference is the smaller number of hide working tools in the Earlier LBK, 48,1 % of the used zones versus 59,1 % for the Later LBK. This result definitely merits further exploration especially in the light of a possible increase in specialization through time. It is, however, difficult to assess whether we can attribute meaning to this result, considering the fact that we may have only a small part of the original amount of material. This also applies to the observation that relatively more bone and antler traces are present among the flint implements from the Earlier LBK. Other activities such as wood working have similar percentages for both periods.

Noteworthy is that the Earlier LBK has a larger number of sickle blades than the Later period. It is not clear to what this is related. It may be due to

	Older LBK	*%*	*Younger LBK*	*%*
bone & antler	15	*4,4*	3	*2,7*
hide	164	*48,1*	65	*59,1*
butchering	13	*3,8*	-	-
cereal	32	*9,4*	6	*5,5*
wood	38	*11,1*	10	*9,1*
soft plant	2	*0,6*	3	*2,7*
polish '23'	7	*2,1*	4	*3,6*
polish '10'	13	*3,8*	-	-
hard mat	13	*3,9*	6	*5,5*
soft mat	7	*2,1*	3	*2,7*
uns	37	*10,7*	10	*9,1*
tot %	341	*100*	110	*100*

Tab. 5. *Comparison of demonstrated activities for the Older and the Younger LBK (in terms of used zones).*

our choice of samples as these tools can hardly be missed because of the extensive macroscopically visible gloss. Further research will hopefully shed light on the question whether sickle blades indeed decrease in number through time, suggesting an alternative harvesting method.

8. Conclusion

The use-wear study of a selection of the flint artefacts from Elsloo and Elsloo-Riviusstraat has shown that a range of domestic tasks is represented. With respect to craft activities hide working is by far predominant, something we also see in the other LBK settlements on the Graetheide Plateau (Van Gijn 1990; Verbaas and Van Gijn 2007; Van Gijn 2010). It was suggested above that the large number of extensively worn hide scrapers may be reflective not only of the processing of substantial numbers of skins, but also of the high quality of the end product. Especially, currying hides quickly wears out scrapers. There is also evidence for dehairing and thus for the making of leather. The presence of hide borers and knives indicate clothing or containers were manufactured from the processed hides.

Wood working also constituted an important craft activity. Other craft activities include some limited bone and antler working, most likely involving the production of small objects. Last, if 'polish 23' is indeed connected with flax processing, then there is also evidence for this activity. Experiments have shown this to be a domestic task that can easily be embedded in various smaller household activities (Van Gijn 2010).

Subsistence tasks carried out with flint tools include cereal harvesting and butchering. A considerable number of sickle blades were encountered and there is evidence for retooling, involving 'functional shifts' in artefact types (fig.2a). The variability in sickle morphology was considerable, ranging from blade fragments to scrapers. For the most part these inserts were fixed in an oblique manner, considering the triangular shape of the polished area. The result most likely would have been a roughly serrated sickle. The polish seen on the sickle blades displays considerable variation as well, possibly indicating that different crops were harvested with the same implement.

Some chronological differences could be observed in terms of the wear traces observed on the flint tools. Most notable is the increased number of hide working tools in the Later LBK, despite of the fact that fewer implements were studied from this period. This may be interesting to explore further because the evidence presented in this paper suggests some sort of specialisation between households in this task. If this indeed is the case, the increased number of hide working tools in the Later LBK may indicate an increased

Fig. 9. *Reconstruction of the interior of a LBK house (drawing M. Oberendorff, from Van Gijn 2010).*

specialisation through time. Noteworthy is also the relatively lower amount of sickle blades in the Later LBK, a tool type which is not easy to miss as traces are visible with the naked eye. It should be further explored whether this is due to our sampling strategy or whether this decrease in sickles reflects a change in harvesting technique or maybe even diminishing crops.

The spatial analysis of the use-wear data shows that in the central area of the site, at the houses 4 and 8 from the Earlier period and 9 and 12 from the Later LBK, a concentration of used implements, especially of hide processing and butchering tools, could be demonstrated. This is also the area where the principal component analysis of the flint debitage by De Grooth (1987) has indicated that relatively more flint knapping took place, possibly suggesting a loose mode of production. Spatial analysis of the use-wear data thus complement and support the idea that in addition to a domestic production, a loose mode of production was practised in LBK context as well.

Nevertheless, this article will conclude in a less elated tone. All of the above conclusions are based on one crucial, but as yet unfounded, assumption: that the pits contain the discarded tools from the houses they seem to be associated with. This assumption cannot be substantiated by the present analysis, yet forms one of the key questions in current LBK research and a central theme in this volume. Another problem with the approach taken in this paper is more specific to the site of Elsloo. The way of excavating, with pits only rarely excavated completely, means that we have no knowledge of the original number and composition of flint implements that were discarded or deposited in the pits. Another problem at Elsloo is the density of the features: houses are located so closely together that we have no certainty about the association between pits and houses. This especially affects the spatial and quantitative analysis of the findings from the use-wear study. Hopefully, in the near future it will be possible to excavate a shortly occupied settlement which can be researched in a more detailed manner. In the meantime the data presented in this paper add to our knowledge of domestic activities carried out within a LBK settlement. Such craft activities usually remain largely invisible and therefore rarely figure in reconstructions of LBK life, reconstructions which often only provide a bird's eye view of a settlement. Use-wear analysis allows us to zoom in on the daily tasks carried out within or around the houses (fig. 9).

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