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## **A different perspective on the Carolingian economy: Material culture and the role of rural communities in exchange systems of the eighth and ninth centuries**

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## Stone artefacts

## Introduction

Stone artefacts are often difficult to date independently from morphologically distinct features. Therefore it is likely that the number of stone objects assigned to the Carolingian period is underrepresented, particularly on sites with several periods of occupation. Only millstones sometimes show attributes which can be used to make chronological distinctions. Furthermore, in most cases this is the only kind of stone artefact found on our sites that can be provenanced. For other artefact groups it can usually only be determined whether the source was likely local or non-local. The following will deal with the stone tools, first millstones, the sharpening tools, weights and finally miscellaneous objects. The last group mainly comprises artefacts discovered at Wijk bij Duurstede. They are included here in order to give an impression of the kind of goods produced in stone that were available in the Carolingian period.

### 6.1 Millstones

The millstones discussed here, those which were prevalent on rural sites in the research area, were roughly between 45 and 50 cm in diameter (fig. 6.1). They were shaped out of tephrite cut in quarries in the German Eifel region, around the modern town of Mayen.<sup>1</sup> Two rural sites have produced (likely) fragments of millstones made of sandstone, namely Berkel-Enschot-Enschotsebaan (139) and Serooskerke (165). Tephrite has several advantages for usage as millstone compared to other kinds of rocks. It will not contaminate flour with crystals or rock particles and the surface of the stone is constantly renewed in the process of milling.<sup>2</sup> At the same time it is not so soft as to wear too quickly.

Non-rotating millstones from the Mayen area were present in the research area from the Bronze Age, but the first rotating millstones were probably introduced in the second century BC.<sup>3</sup> Under the Romans output from the quarries intensified, but after the Roman period there appears to have been a decline in production.<sup>4</sup> The exact output is not clear for the time between the Roman and Carolingian period and it has even been suggested, based on British and northern German evidence that during the sixth and seventh century the export of Mayen quernstones largely halted.<sup>5</sup> However, although this may be true for Britain and parts of Germany, millstone fragments have certainly been found on seventh century sites in the Netherlands.<sup>6</sup> The sixth century situation is perhaps less clear, but this may be due more to the lack of sites clearly dated to the sixth century and well published, than anything else.<sup>7</sup> At this time it is not possible to determine whether the geographical spread of millstone distribution increased during the sixth to ninth centuries. For sites along the Rhine, in the IJssel valley and along the coast the evidence suggests there was considerable continuity in the availability of millstones from the Eifel. However, in areas like Drenthe or much of Limburg it

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1 Parkhouse 1997, 98.

2 Kars 1980, 401-402.

3 Van Heeringen 1985, 371-383.

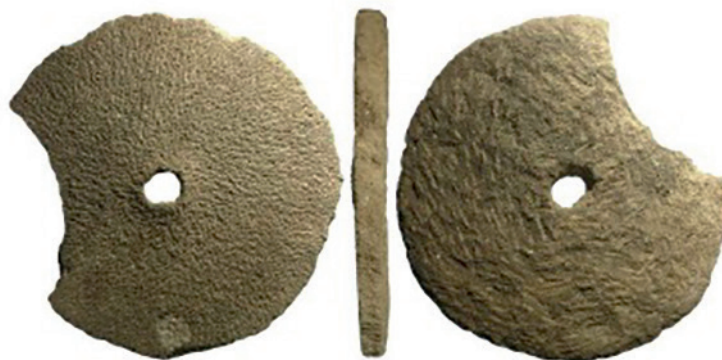
4 Mangartz 2008, 106.

5 Bischof 2000; King 1986, 97.

6 To name but a few: fragments of tephrite have been found at Geldrop (136) in wells dendrochronologically dated to the seventh century, Oegstgeest-Rijnfront zuid (Hamburg/Hemminga 2006, 89), Deventer-Kloosterlanden (Groenewoudt 1987, 239), Zelhem-Provinciale weg vindplaats 4 (Kenemans/Van der Velde 2002, 73), Hallum (19), Groot Olmen (212).

7 An excavation in Colmschate near Deventer revealed traces dated mainly to the 4th and fifth century as well as some sixth century features. Several features and structures dated to the early middle ages contained millstone fragments (Vermeulen/Mittendorff/Hermesen 2009, 73).

is difficult to determine because of a general lack of sites for parts of the early middle ages or due to insufficiently detailed excavation reports. An excavation in Beegden (67), along the Meuse in the province of Limburg was dated to the late seventh and early eighth century and did not yield tephrite fragments, despite a range of other stone artefacts being present.<sup>8</sup> Whether this is representative for sites along this section of the Meuse cannot be determined due to lack of material for comparison.



**Fig. 6.1** Almost complete quernstone found at Boxmeer (104, Blom/Van der Velde 2015, 293, afb. 7.36).

At any rate, an increase in activity is assumed in the quarries near Mayen from the eighth century onward. However, the dating of this revival is based on limited data and seems to be essentially founded on a lack of evidence for sixth and seventh century export.<sup>9</sup> Small scale excavations in one of the quarried areas revealed a single rim-shoulder in Mayen fabric ME and of type F18, generally dated to the eighth and ninth century, besides a few prehistoric and Roman sherds. No sixth and seventh century pottery was recovered during the investigation. The remains of millstones recorded during the excavation did not show the typical Roman cone shape and may have been either Roman stones in a very early stage of production or early medieval stones, which have more or less flat grinding surfaces. However, this one find context can hardly be considered conclusive evidence for a lack of production in the sixth and seventh century.

Carolingian millstones were not finished on site in the quarry as they had been in prehistory, or on sites in the town of Mayen and the harbour of Andernach as in the Roman period.<sup>10</sup> Only blanks, without the central aperture were created at the quarries. These were subsequently shipped, which meant the stones needed additional dressing at some stage before final use. Parkhouse argues this was done to minimise the risk of breakage, which was probably at its highest when creating the aperture.<sup>11</sup> The so-called 'roughouts' were transported to various destinations throughout northwest Europe. Among the sites where they have been found in Carolingian contexts are Dorestad, Haithabu and Ipswich, in other words mainly on sites which have been directly linked to interregional exchange.<sup>12</sup> Evidence from the Dorestad site certainly suggests roughouts were finished on site, but it cannot be said for certain whether this was part of the artisanal activities in the town aimed

<sup>8</sup> Melkert 2015, 64.

<sup>9</sup> Mangartz 2008, 121 and 124.

<sup>10</sup> Hörter/Michels/Röder 1950, 26-27; Mangartz 2008, 73-80.

<sup>11</sup> Parkhouse 1997, 104.

<sup>12</sup> Parkhouse 1997, 99-102.

at exchange or simply intended for the settlements own needs.<sup>13</sup> The Dorestad finds do not include waste from dressing stones and creating the apertures, which has been discovered at Haithabu and the Thames-Exchange site in London. Therefore Parkhouse believes only the millstones needed in the settlement were finished at Dorestad.<sup>14</sup> Although the Eifel quarries were not the only sites to be active in the Carolingian period, it does seem to be the only supplier in our research area and its wider surroundings.<sup>15</sup>

The greatest obstacle when interpreting the spatial distribution of millstones on sites in our database is the fact that millstone can only rarely be dated on morphological criteria. The dating of the finds is therefore dependant on the context they are found in. It is possible that some sites did produce remains of millstone that were used in the Carolingian habitation phase but which could not be recognised as such because they were not discovered in a Carolingian context. Furthermore, stone objects are one of the artefact categories which are often poorly documented and published and therefore problematic to assign to specific features and structures. This means that besides the fact that it is difficult to assign millstone fragments to the correct time period, the amount and weight of the fragments is more often than not unknown. All these factors mean comparisons of relative frequency and find-density of millstones between sites and regions is not possible.

In order to make some distinctions in the probability of stone tools, and in particular millstones being present on a site the presence or absence was recorded as discussed in chapter 4. Stone artefacts can be either present and recorded at a site, definitely not be present, it can be unclear due to lack of documentation, and finally documentation may be lacking but the presence of artefacts is probable.

Figure 6.2 is a map showing the presence or absence of stone artefacts on Carolingian sites according to these criteria. The contents of the map caution against over-emphasising the significance of 'empty' areas. For example in the central Dutch river area (region 6) there is a large number of sites where no artefacts have been found, but closer inspection shows that most of those sites consist of either small excavations or trial trench campaigns. The publication of sites between the Meuse and the Peel area in region 8 do not all contain the level of detail needed to assign artefacts to features and structures. The same is true for most of the sites in the eastern part of region 3. In order to get a better idea of areas that are actually devoid of stone artefacts it is necessary to factor in the nature of excavations and the quality of publications.

A second map (Figure 6.3) is an attempt to do this for millstones. It shows all sites where millstone fragments have been recorded, but also sites with a publication quality of 1 or 2 and an excavation score of 1 to 3 where they have not been recorded. This leaves a small number of sites which have been excavated and published well enough to have produced Carolingian millstones, but which did not. Many of these fall in the category 'small-scale excavations' (score 3). This suggests a lack of millstone fragments on sites present in the database is primarily due to factors relating to the nature of excavations and inadequate publication. What the map shows is that millstones were a common object on Carolingian sites in the research area. Whether this means they were easily acquired or considered valuable or not is another matter. Millstones on rural sites never seem to be present in large quantities. Combined with their wide distribution they were likely regarded not so much as a luxury item but as an expensive necessity. However, with limited data on quantities of millstones per site this is difficult to assess.

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13 Kars 1980, 417-421.

14 Parkhouse 1997, 104.

15 Kars 1980, 402.

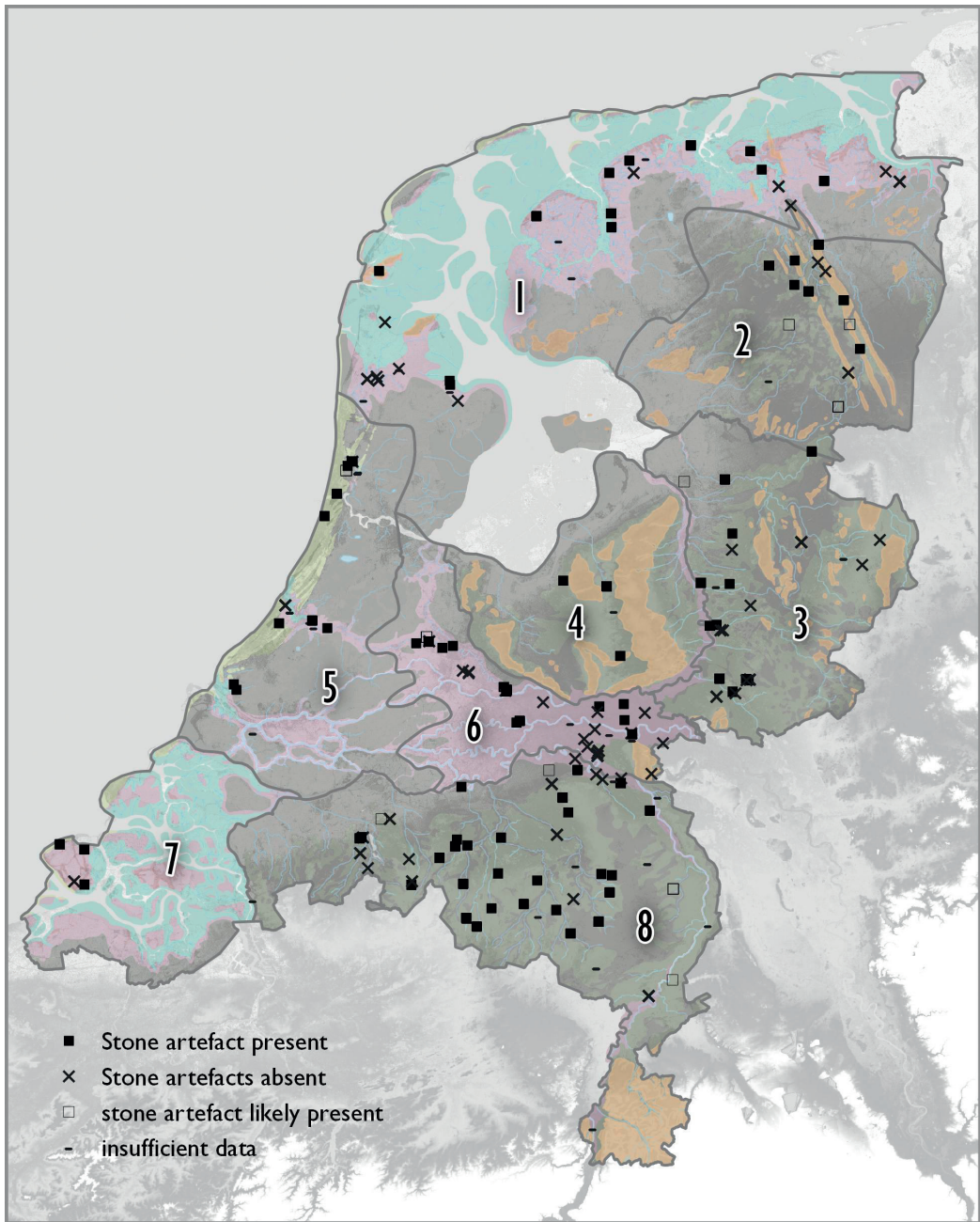
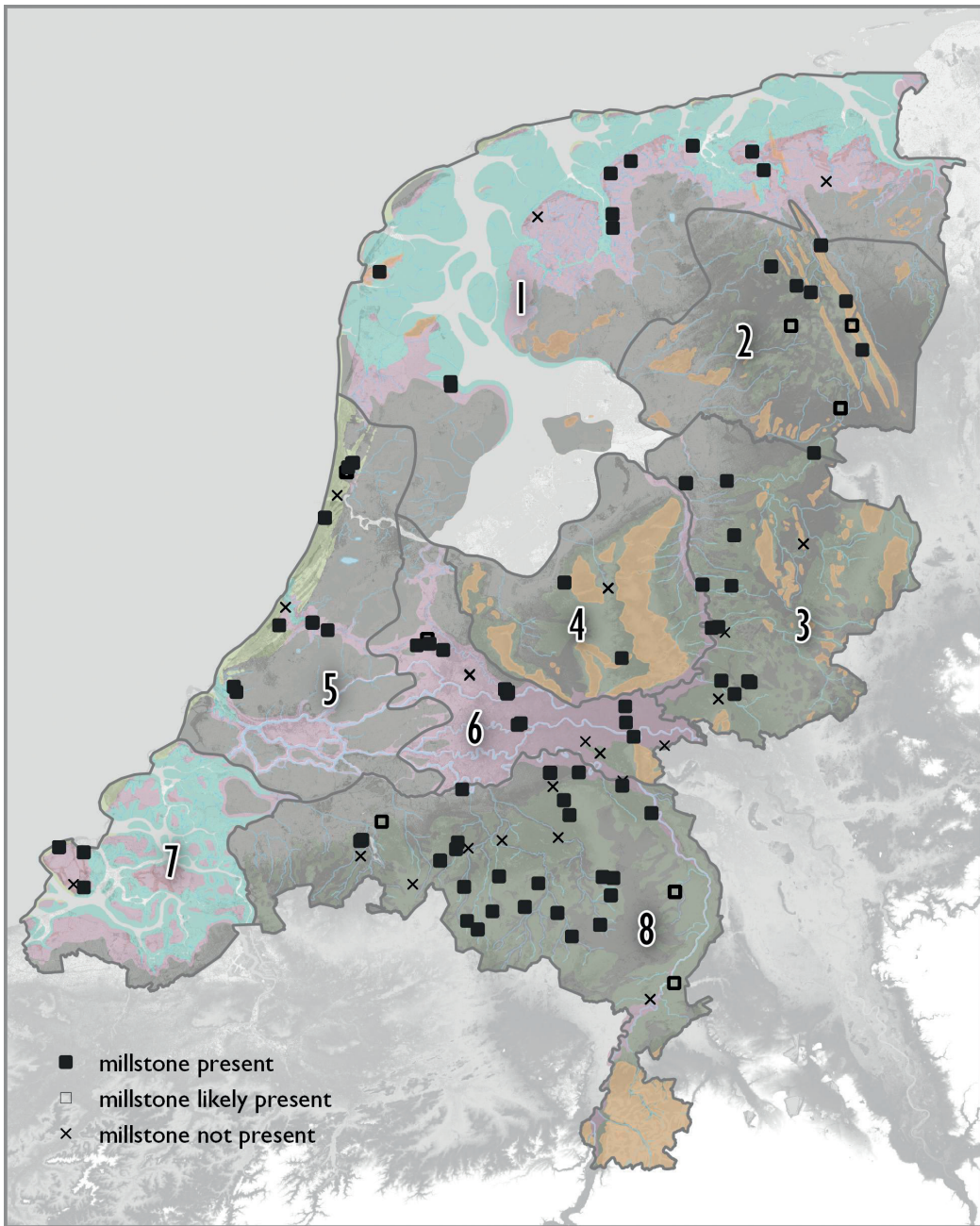


Fig. 6.2 Presence or absence of stone artefacts on Carolingian sites in the research area.



**Fig. 6.3** Carolingian sites where millstone fragments have been found. The map also shows sites where the find report is not detailed enough to be certain that millstone fragments belong to the Carolingian habitation phase, but where it is very likely that they do. In additions sites are indicated where millstone fragments might have been expected to have been recorded given the quality of excavation and publication, but were they were not present.



Three sites in the research area have produced (fragments of) roughouts, namely Dorestad (mainly sites 58 and 528) as already mentioned, Medemblik (164) and Naaldwijk (219). The find of a roughout at Medemblik has often been regarded as one indication that it was an important town in the Carolingian period, a subsidiary of Dorestad with a toll station.<sup>16</sup> Because roughouts up till now have mostly been found at sites which are presumed to have had an exchange function they almost become a proxy for this kind of settlement. The find at Naaldwijk puts this in a slightly different perspective. Nothing about the Naaldwijk site otherwise explicitly links it to an exchange function and therefore the find indicates that in some cases at least, millstones were transported to end consumers as unfinished stones to be completed on site. Two sites with a rural character in Schleswig-Holstein also contained semi-finished stones.<sup>17</sup> The fact that we do not find these stones more often in (rural) settlements can be explained simply by assuming the stones were used and therefore worn. However, more evidence for breakage of semi-finished stones might be expected in that scenario. The Naaldwijk find at least suggests that we should not view a single example of a roughout on sites as a direct indicator for a trade function.

## 6.2 Sharpening tools

Sharpening tools are often divided into whetstones, sharpening blocks and sharpening stones, the size of the objects being the principal discriminator.<sup>18</sup> Whetstones were smallest and meant to be held in hand while block sharpening tools and sharpening stones were large and stationary.<sup>19</sup> In theory some of the sharpening tools could have their origin outside the research area such as Scandinavia, the Ardennes or the German Rhineland.<sup>20</sup> However, reused Roman material is also possible as are local deposits, particularly in areas with ice-pushed ridges. Sharpening tools have been discovered less frequently than millstone fragments, but their distributions are roughly similar (fig. 6.3). Differences can be observed in region 2 and the north of region 3 where just three sites have certainly yielded sharpening tools, compared to at least ten that produced millstone fragments.<sup>21</sup> Region 4, an area in the north of region 8 and the east of region 6 are also less well represented compared to the millstone finds. The discrepancies could be partially explained by the ease with which the respective artefacts can be identified. Identifiable objects made from tephrite are almost always millstone fragments. This makes it plausible to assume that tephrite fragments without characteristic features were also once part of a millstone. Fragments of sharpening tools on the other hand may not be recognised as such, leading to an underrepresentation relative to millstones. This makes it difficult to assess what the lack of sharpening tools in some areas implies. In the eastern part of region 6 sites generally have rather small find assemblages and several sites have also not produced millstone fragments. However, as far as sites in the north of region 8 are concerned, several of them are large and relatively well excavated examples.

Sharpening tools would have been used in metalworking, for sharpening utensils such as knives or ploughshares and for wood and bone working. With regard to our dataset the possible relationship

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16 Besteman 1989, 21-22.

17 Schön 1995, 101.

18 For example Kars 2001, 347-350.

19 Kars 1983, 3.

20 Kars 1983, 26-34.

21 The evidence for the three sites in region 2 where stone artefacts belonging to the Carolingian habitation phase have likely been recovered only imply the presence of millstone fragments. The same is true for similar sites in other regions.

with metal working is tenuous. Sharpening stones were discovered at Doetinchem-Lookwartier (44) and Berkel-Enschot-Enschotsebaan (139), and other sharpening tools were found at Alphen-Molenbaan (106) and Utrecht-A2 (525). At each of these sites clear evidence for metal working has also been discovered. However, at all other sites containing remains of metal-working no sharpening tools have been found (see chapter 6 for an overview of the sites). The observation made in the previous chapter that iron on rural sites seems to have been used primarily in tools intended for some form of cutting probably provides a better context for understanding the presence of sharpening tools generally.

### 6.3 Weights

Weights are often identifiable as an irregularly shaped stone with a perforation, or grooves where a rope of some kind was attached. The weights for which the kind of stone was specified in the available excavation reports were made of tuff. Some weights are interpreted as net-sinkers while others are simply described as weight. Most of the weights were found on sites in the direct vicinity of bodies of water (Leens (22), Leiderdorp (158), Utrecht-A2 (525)), which is in line with the interpretation of net-sinker. In his study of the tuff artefacts from Dorestad Kars investigated the likelihood of tuff weights having functioned as net sinkers.<sup>22</sup> He concluded that the effective mass in water of most of the weights would be suitable for use as net sinker but only in water with slow currents and as part of so-called *seine-nets*. These are nets with heavier weights along the bottom and lighter ones along the top, keeping the net vertical in the water. The fact that many tuff weights were found in the harbour excavations of Dorestad is another indication that they were indeed used as net sinkers. One of the stones found at Leiderdorp (158) and interpreted as a net-sinker would appear to be too heavy for use in a seine-net, weighing 1543 grams, where 100-200 grams was common among the Dorestad material.

### 6.4 Other artefacts

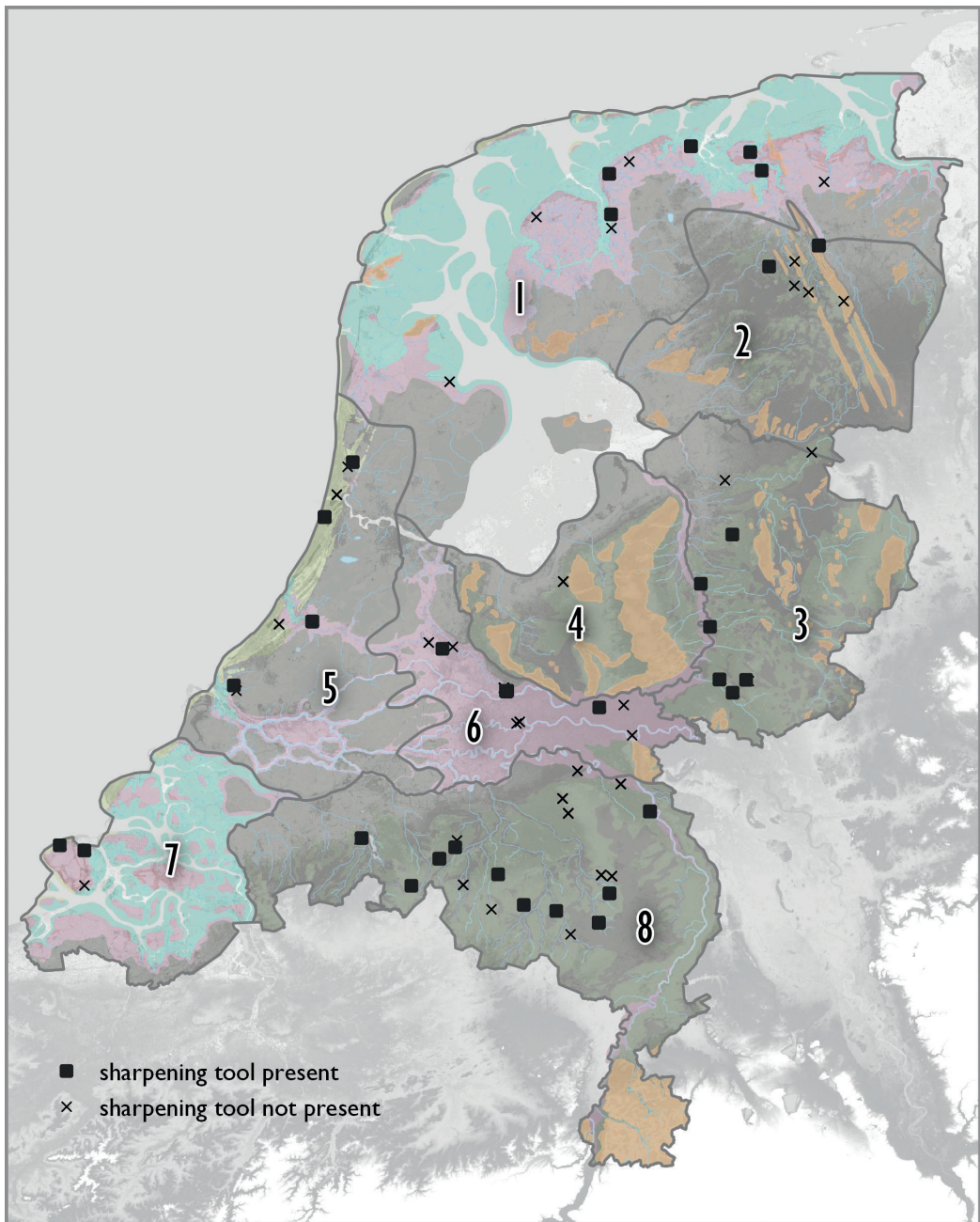
Touchstones were used to determine the purity of gold and therefore might reasonable be connected with exchange. In total 13 touchstones and four lydite pendants which are also believed to have been used as touchstones have been found on Carolingian sites in our research area. The link with exchange seems validated by the fact that all but two were discovered at excavations in Wijk bij Duurstede. The others come from the Groot Olmen site (212) in region 5 and Utrecht-Appellaantje (526).

Another group of artefacts rarely found outside a town context are those made of amber. At Wijnaldum a single amber bead was recovered from a Carolingian context and another was discovered at Wijk aan Zee (172). Considering Wijnaldum and Wijk aan Zee were both investigated intensively, recovery of amber objects and fragments may be as dependant on excavation methods (sieving) as glass artefacts.<sup>23</sup> The abundance of finds from Wijk bij Duurstede can partly be related to excavation methods (Veilingterrein, site 187), concentration in a single feature (De Geer II, site 190) and the sheer quantity of material recovered during the Hoogstraat and De Heul excavations.

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<sup>22</sup> Kars 1982, 152-159.

<sup>23</sup> See chapter 3 on formation processes.



**Fig. 6.4** Shows sites where sharpening tools have been discovered and recorded and sites where sharpening tools might be expected to have been recorded but were not found (based on publication and excavation scores and/or presence of other stone artefacts).

For the Wijk bij Duurstede sites there is evidence that amber was worked at several locations. The Heul and Harbour excavation both revealed a concentration of amber fragments and at the De Geer II site a relatively large amount of amber fragments was found in a single pit. For other sites amber production does not seem likely. Wijk aan Zee and Utrecht-Buurkerk (541) both yielded a lump of amber but nothing more to indicate amber working.

Among the few amber artefacts beads are most common, in fact other artefacts were only found at Wijk bij Duurstede. Here the bridge of a lyre, three pendants, four spindle-whorls and two small pegs were discovered in the settlement area of the site and a further pendant and spindle-whorl in the harbour area. These objects may represent (part of) the range of objects produced at the site, though they could also simply have been brought to the site.

Besides the touchstones and amber artefacts, the excavations in Wijk bij Duurstede have produced a series of objects not found on any other site in the research area (table 6.1). Among these are mortars of which 103 fragments have been discovered, five stone spindle whorls, stone tuyeres, and several items of tableware. As most of the objects solely found at the Dorestad site were recovered in very small numbers they probably do not represent objects widely used on rural sites of the period.

Some flint artefacts have also been discovered in Carolingian contexts. It is difficult to determine whether their production was contemporaneous with Carolingian habitation, a residual find related to prehistoric habitation in or around a site, or a prehistoric object recovered and used during the Carolingian period.

Artefact	AM	PH	GY	CH	KW	QW	SL	LY	TE	TU	XX	SA	Total
anvil						1							1
bead	5										1		6
block-shaped object				1									1
bowl											2		2
bridge of lyre	3												3
cup-like object				1									1
dish-like											1		1
fragment	74			2							1		77
funnel				2									2
gaming disc				1									1
hammerstone						1							1
millstone									1227				1227
mortar				95							3	11	109
net-sinker				16					1	73		2	92
peg	2												2
pendant	3							1					4
sharpening tool		1		6	7	13	3	1	3		50	366	451
spacer			1										1
spindle whorl	5												5
touchstone								11					11
tuyere							2			1	2		5
weight										1		1	2
<b>Total</b>	<b>92</b>	<b>1</b>	<b>1</b>	<b>124</b>	<b>7</b>	<b>15</b>	<b>5</b>	<b>13</b>	<b>1231</b>	<b>75</b>	<b>60</b>	<b>380</b>	<b>2005</b>

**Table 6.1** Stone artefacts from Wijk bij Duurstede sites (sites 58, 186-190, 528). AM= amber, PH= phyllite, GY= gypsum, CH= chalk, QW= quartz, KZ= quartz sandstone, SL= slate, LY= lydite, TE= tephrite, TU= tufa, XX= indeterminate, SA= sandstone.

## 6.5 Conclusion

In many respects stone artefacts would seem of limited use for the questions posed in this research. They cannot be dated accurately and most artefacts cannot be provenanced with any great accuracy either. However, one group of objects, tephrite millstones more than makes up for the general inadequacies. They can be accurately provenanced and their distribution can also be directly compared with another important group of artefacts, Mayen ceramics. Both were produced in close proximity and at least in some cases were transported together over the Rhine.<sup>24</sup> We will consider this relationship more thoroughly in the next part of the research but it is clear from the data presented in this chapter and that on ceramics that both did not have entirely similar distributions.

With regard to the distribution of millstones it was possible to show that they were probably a fairly standard feature of a Carolingian rural household or at least of settlements in our research area. Given the long tradition, dating back to the Bronze Age of tephrite stones being used for grinding in our regions this is perhaps not surprising. Unfortunately, given the state of publishing of stone artefact assemblages it is not possible to determine whether there was a significant increase in the import of millstones from the seventh to the ninth century. However, there is little to suggest there was such an increase on rural sites.

The only other stone artefact group that has been found in reasonable quantities in the research area are various forms of sharpening tools. Though they have been discovered (or recognised) less often than millstones, their distribution mainly differs in detail. What is more important is that both artefact groups show little evidence for regional differentiation. Much like the iron artefacts we saw in the last chapter, millstones and sharpening tools appear to be normal components of rural material culture. At the same time, none are present in great quantities nor do they represent a broad range of objects, suggesting a certain frugality. To what extent this is reflective of rural dwellers demand and their role in exchange systems is a question to be addressed in the following chapters.

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<sup>24</sup> Ellmers 1972, 298.

