CHARCOAL ANALYSIS OF IRON AGE CEMETERIES IN EAST-CENTRAL SWEDEN

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Abstract

This article presents the results of the analysis of charcoal from the cremation layers from two grave fields in east-central Sweden. An attempt is also made to interpret the results in social and ritual conceptions.

Introduction

The creation of large cemeteries in east-central Sweden began in the final phase of the Bronze Age. The change meant a transition from isolated stone settings and cairns to larger, assembled cemeteries. The older graves are often found on hilltops, whereas the cemeteries tend to be in lower ground close to settlements. The continuity from the Late Bronze Age is clearly observable on a general level (Hyenstrand 1984:85 f.). The Early and Late Iron Age show differences in mortuary customs, as reflected in the archaeological material (Fig 1). It is therefore reasonable to envisage a change in the composition of the charred wood as a result of a change in mortuary practice.

The Migration Period (ca. 450–550 A.D.) was a time of change. The cremation layer became the predominant form of burial, but certain patterns survived or were revived in later periods (Hyenstrand 1966:105 f.). In the Early Iron Age the burnt bones may be embedded in a sooty layer. This cannot be termed a cremation layer in the strict sense. The size of cremation layers tends to increase towards the end of the Late Iron Age (Petré 1984b:47). The cremation layers in men's graves also appear to be bigger than those found in women's graves (Tenghed 1995:36).

Early Iron Age	*Late Iron Age*
Stone settings with exposed curbstones	Barrows
Stone settings with varying shapes, rectangular, square, triangular	
Variation in construction details and choice of contrasting stones	
Flat grave profile	Dome-shaped grave profile
Occasional cremated bones	Cremation layer
Bone layers	
Urn graves	
Cremation pits	
Resin-sealed vessels to hold bones. Ceramic vessels occur	Ceramic vessels to hold bones
Few artefacts in the graves	Numerous artefacts
Few or no animal species represented in the bones	Larger variety of animals represented in the bones

Fig 1. General features of mortuary practice and grave forms in the Iron Age (after Bennett 1987, 21 f.).

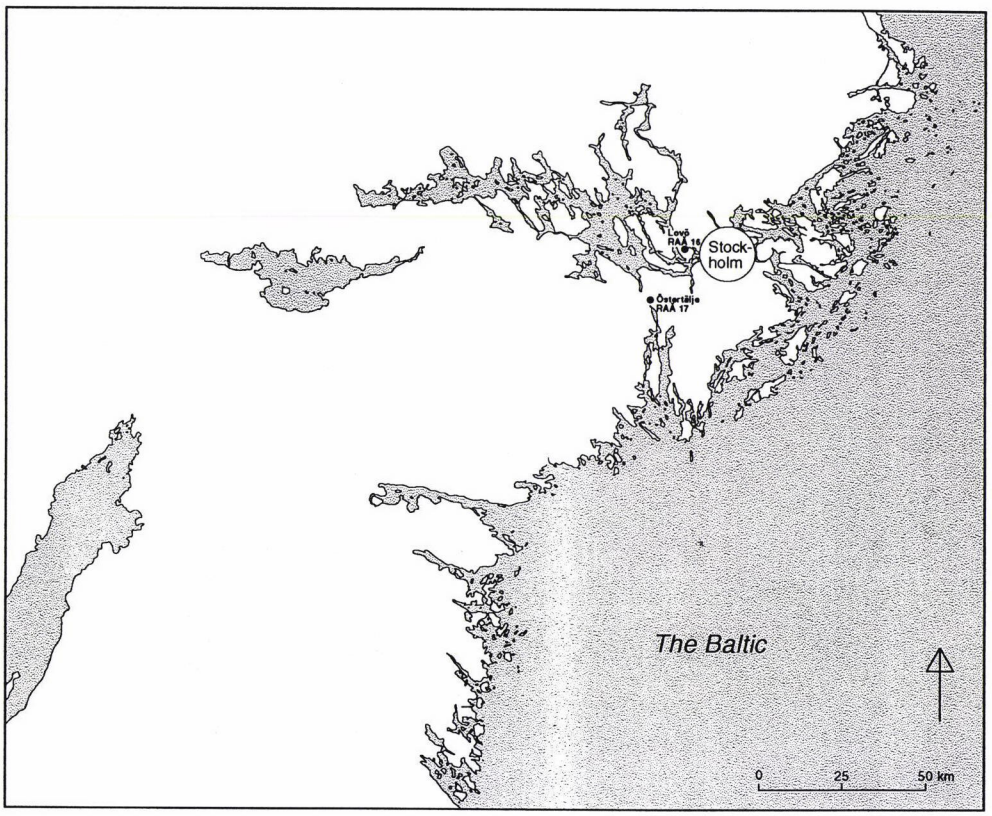

Fig. 2. Map of east-central Sweden with the sites the sites Lovö and Östertälje indicated.

Aims and Methods

The main idea underlying this article is that studies of excavated material allow us to draw conclusions about social and economic conditions and ritual conceptions in prehistoric times. The aim of the analyses is also to look for correlations between variations in the composition of wood types and other archaeological observations.

Identifications were carried out according to customary routines for the analysis of charcoal. The charcoal was broken into pieces. Tangential sections, radial sections, and cross-sections were studied by microscope with illumination from above. Enlargement varied between 80x and 500x. Besides a reference collection of charcoal samples, the following reference literature was used: Greguss 1945, Mork 1966, Schweingruber 1978.

The Excavated Antiquities

The two cemeteries were situated in east-central Sweden (Fig 2). Grave field RAÄ 16 was at Söderby, Lovö Parish, Uppland. This excavation was conducted within the framework of the Lovö Project at the Department of Archaeology, Stockholm University (Petré 1984b:149 f.). The grave field was very similar in character to other cemeteries from the same time on the island of Lovö. The find material was perhaps some-

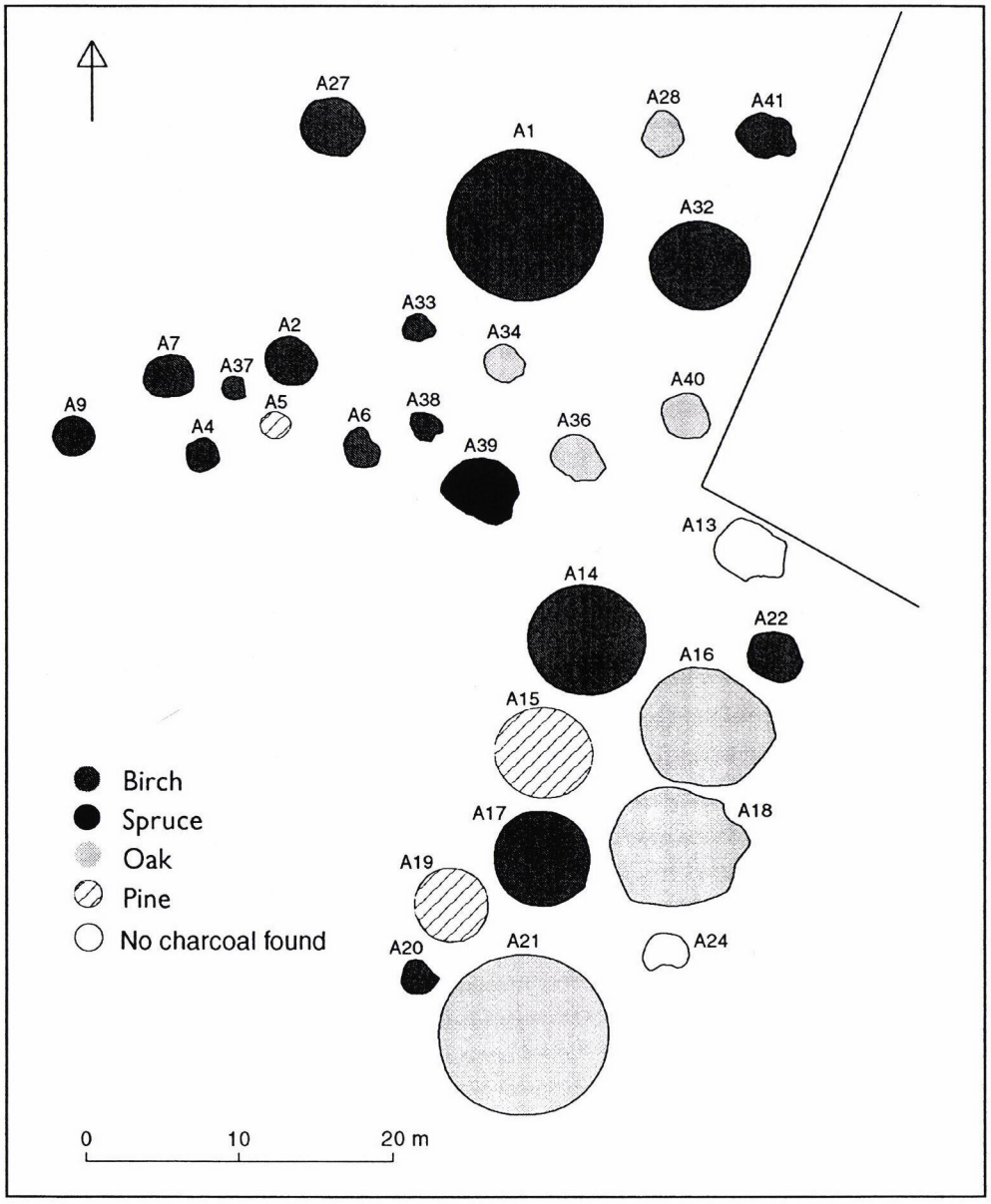

Fig 3. The grave field RAÄ 16, Lovö Parish.

what simpler in character, without any objects clearly showing high status (Petré 1984a:101). The grave field, which consisted of over thirty graves, eight of them barrows, was used from the end of the 5th century until the 9th century A.D. The datings are based on finds and ^{14}C analyses.

RAÄ 17 was at Karleby, Östertälje Parish, Södermanland. These excavations were conducted by the Central Board of National Antiquities, Archaeological Excavations Department, occasioned by the extension of an industrial complex. According to an earlier survey, the grave field comprised about ten barrows and some forty stone set-

tings. The total number of graves is probably much more than this, since more than thirty graves were found in the excavated area alone. The grave field was previously thought to be mainly from the Late Iron Age, but the new excavations show that it can be dated back to the Pre-Roman Iron Age.

The excavations took place in the northern part of the grave field. Since only part of the grave field was excavated, it is difficult to determine which direction it was expanded in. According to the ^{14}C datings, the central section is the oldest. The grave field was then extended to the west. The graves from the Late Iron Age may possibly overlie the very oldest sections. Another possibility is that the oldest graves are on a height to the south.

Charcoal Analyses

Grave field RAÄ 16, Lovö Parish

A total of 8918.6 g of charcoal was collected. The analysed weight corresponds to just over 11% (figs. 3–5).

The predominant types of wood in the cremation layers are birch and oak. The fragmentation of the charcoal was broadly similar and did not in any way affect the rank-

Analysed weight	*Total number*	*Pine (Pinus silvestris)*	*Spruce (Picea abies)*	*Juniper (Juniperus communis)*	*Coniferous wood (indet.)*	*Birch (Betula sp)*	*Alder (Alnus sp)*	*Hazel (Corylus avellana)*	*C.a. nut shell*	*Maple (Acer sp)*	*Willow (Salix sp)*	*Lime (Tilia cordata)*	*Prunus sp*	*Bark*	*Oak (Quercus sp)*
1001,6	4016	239	275	9	103	1443	39	4	11	3	28	1	5	1761	147

Fig 4. The total weight and number of fragments of each type of wood at grave field RAÄ 16, Lovö Parish.

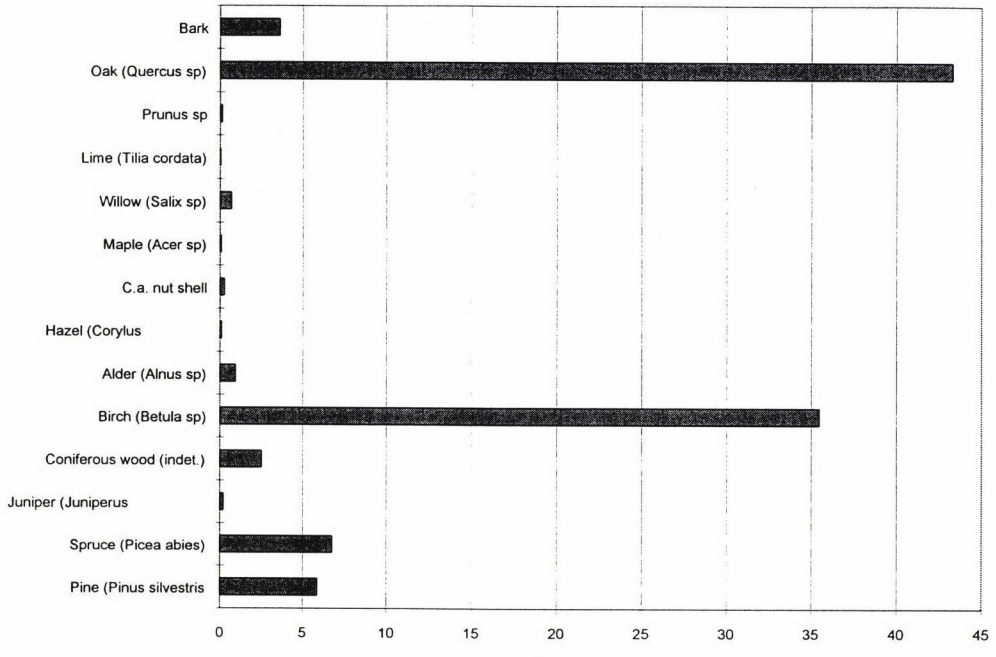

Fig 5. Percentages of identified woods at grave field RAÄ 16, Lovö Parish.

Anl nr	Bark	Oak (Quercus sp)	Prunus sp	Lime (Tilia cordata)	Willow (Salix sp)	Maple (Acer sp)	C.a. nut shell	Hazel (Corylus avellana)	Alder (Alnus sp)	Birch (Betula sp)	Coniferous wood (indet.)	Juniper (Juniperus communis)	Spruce (Picea abies)	Pine (Pinus silvestris)
1	21,15	1,92					0,96			63,46			7,69	4,81
2	5,10								37,76	42,86			14,29	
4	10,20									81,63				8,16
5										1,89			18,87	79,25
6	1,49									94,03			4,48	
7	11,43	2,86								85,71				
9	1,69	5,08								93,22				
14	1,08	9,71					0,36		0,36	64,03			24,10	
15														100,00
16	6,90	81,03								11,21			0,86	
17										100,00				
18	0,66	93,07					0,66			1,32			3,30	0,99
19	8,89									26,67				64,44
20	4,17	4,17								58,33	18,75		2,08	12,50
21	0,67	84,32		0,11	0,11		0,11		0,11	13,01	0,11		1,45	
22	3,03		3,03		0,61					63,03			30,30	
27	9,80				9,80					63,92	10,20		0,39	5,88
27	6,00	60,00			2,00					10,00	4,00		16,00	2,00
32	11,76									88,24				
33		24,36								70,51		0,64		4,49
34	3,23	80,65								8,06			8,06	
36	3,27	44,90					0,82	0,41		39,18	1,22		2,45	7,76
37										72,73				27,27
38	6,67	0,83								37,50	28,33	0,83	25,00	0,83
39							1,79			16,07	23,21		58,93	
40	0,71	86,75					0,24			5,94				7,36
41	15,38	1,10				2,20	2,20	3,30		67,03		7,69		1,10

Fig 6. Percentages of wood species calculated on the basis of the total for each grave.

ing order of the different species. Since the charcoal was thoroughly divided, it was not possible to find any fragments with traces of working. The water-sieving may have caused any such traces to be worn off. Three of the cremation layers (A 5, 15, 19) consist mostly of pine. In A 39 spruce is the most common species. Spruce, birch, and oak feature generally in several of the cremation layers.

On the basis of an analysis of the osteological and archaeological material, Petré has found a structure in the distribution of male and female graves in the grave field. If this is compared with the classification of the results of the wood analysis, we find an association between men's graves and the occurrence of oak. The barrow, A 21, is a double grave with a man and a woman, which in this light may explain the occurrence of oak in the grave. A 16, with a predominance of oak, is osteologically identified as a woman's grave, but the finds in the grave rather suggest that a man was buried here. From this it should be clear that it is somewhat early to assign any general significance to the occurrence of oak.

The distribution of oak also appears to be chronologically conditioned. The younger graves have a larger element of oak. Graves with willow (*Salix* sp.) can also be distinguished (A 22, 23, 28). These lie in the south-western part of the grave field. According to Petré's classification, they represent consecutive generations. Perhaps one can detect a burial ritual in which kinship was marked. A 21 also has a small element of willow. This is a recent admixture and consequently of no interest here. Continued analysis on the basis of chronology and affinity between graves may lead to the discovery of more associations.

Grave field RAÄ 17, Östertälje Parish

The collected charcoal weighed 206.7 g, of which just over 61% was analysed (figs. 6–8).

Spruce and birch were the predominant species of woods in the grave field. The analysis of the charcoal from the other structures in the grave field showed that fragments of spruce, pine, and birch were evenly distributed over the whole area. These elements have not been included in the analysis. The pine has proved to belong to

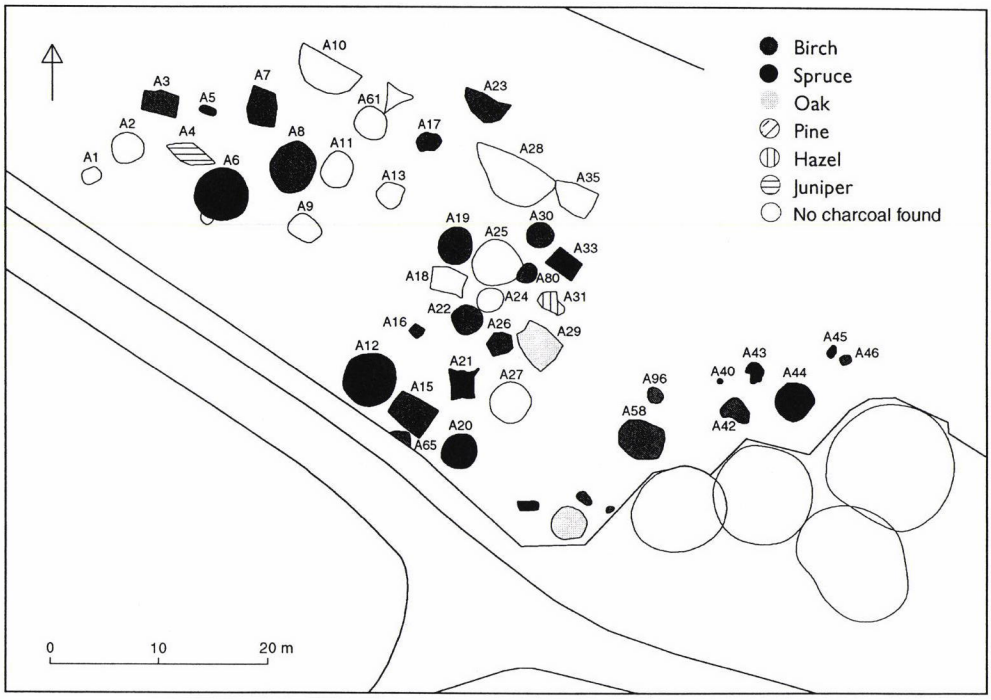

Fig 7. The grave field RAÄ 17, Östertälje Parish.

Analysed weight	*Total number*	*Pine (Pinus silvestris)*	*Spruce (Picea abies)*	*Juniper (Juniperus communis)*	*Birch (Betula sp)*	*Alder (Alnus sp)*	*Hazel (Corylus avellana)*	*C.a. nut shell*	*Vacciniu m sp*	*Maple (Acer sp)*	*Willow (Salix sp)*	*Prunus sp*	*Oak (Quercus sp)*	*Deciduous trees*	*Bark*
127,4	1002	41	343	28	412	4	26	5	2	1	7	3	95	17	14

Fig 8. The total weight and number of fragments of each type of wood at grave field RAÄ 17, Östertälje Parish.

remains from post-Reformation times or from the Stone Age settlement located in the north-western part of the grave field.

Next to birch, spruce is the most common species. It cannot be ruled out here either that the occurrence of spruce should be regarded in part as a contamination. Extensive damage to the grave field has been shown to be due to tar-burning, which was pursued from the 17th century onwards. The tar-pits contained large quantities of charcoal from pine, spruce, and spruce bark. The bark was used to cover the bottoms of the pits.

Oak accounts for a small proportion of the identified woods. The graves containing oak all come from the younger half of the excavated graves. Willow occurs only in the central part of the grave field. Many of the samples here had elements of recent charcoal from pine and spruce, which makes interpretation of the analyses more difficult.

Three of the graves were inhumation of skeletons. In two of them, A 29 and A 31, small concentrations of hazel and resin were found. In the third, A 32, charcoal of spruce and birch lay in the filling of the pit and were not judged to belong to the burial.

A strikingly large proportion of the analysed charcoal in the older stone settings consisted of small twigs. This was also true of the charcoal gathered from the actual

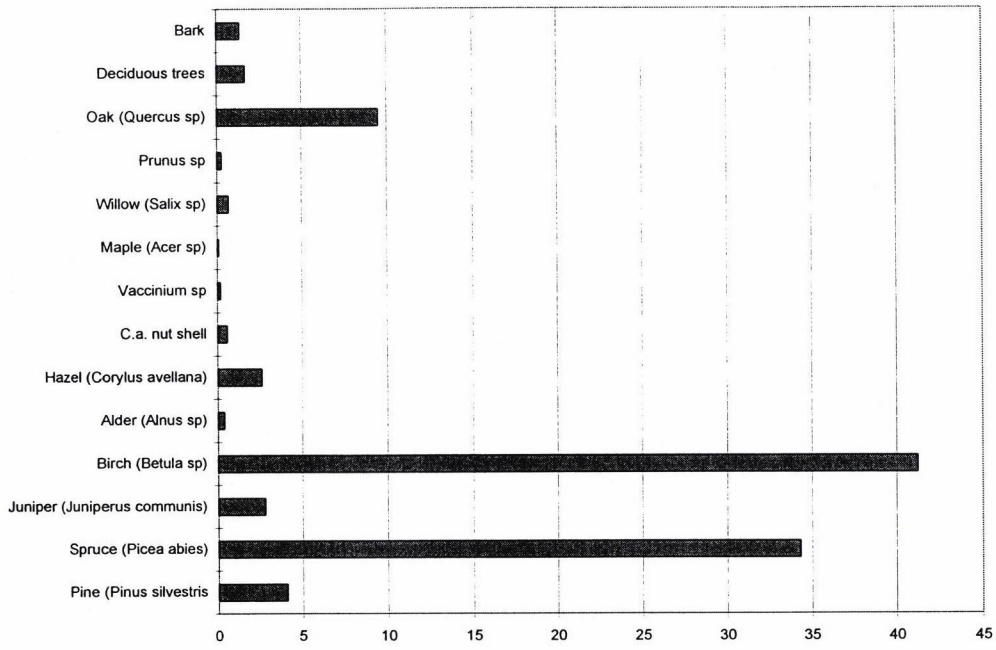

Fig 9. Percentages of identified woods at grave field RAÄ 17, Östertälje Parish.

bone vessels. An example is the stone ship (A 4), where twigs of *Prunus* species, juniper, and birch occurred. The osteological analysis has not been completed, so it is not yet possible to draw any conclusions about associations between age and gender and the charcoal content of the graves.

Results and Discussion

The main idea underlying this work has been that social and ritual conceptions are visible in the composition of the charcoal found in Iron Age graves.

The composition of species naturally reflects the local vegetation. This has also been observed in comparable studies of cemeteries in Europe (Feindt & Fischer 1991; 1994). Yet there are significant discrepancies. In the pollen analyses carried out on the Lovö material, it was found that the predominant tree species are pine, birch, and alder, but spruce, hazel, and oak are also common (Petré 1984b:166 ff.). Maple is not found in the diagram. Hornbeam, aspen, buckthorn, elm, and beech occur in the pollen diagram but not in the collected charcoal. The distribution of species in the cremation layers should therefore not be seen as a direct equivalent of the local vegetation.

According to Sigvallius (1994:16 f.), the most effective funeral pyre should be built of a mixture of both coniferous and deciduous trees. Pine, spruce, birch, and oak are also the predominant species in the analysed material. Most of the graves contain a mixture of these, but graves with only coniferous woods occur.

The number of species in the cremation layers is equally large throughout the Iron Age, but it appears as if the less frequent species – hazel, willow, and others – are over-represented in the Early Iron Age. The richness of species observed thus con-

Anl nr	Pine (Pinus silvestris)	Spruce (Picea abies)	Juniper (Juniperus communis)	Birch (Betula sp)	Alder (Alnus sp)	Hazel (Corylus avellana)	Vaccinium sp	Maple (Acer sp)	Willow (Salix sp)	Prunus sp	Oak (Quercus sp)	Deciduous trees	Bark
3				100,00									
4			75,00	20,00						5,0			
5		77,11	1,20	18,07								3,61	
6		85,71		11,43									
7		3,13		93,75									3,13
8	3,57			87,50	5,36							1,79	1,79
12		44,74	21,05			18,42			5,26			10,53	
14				100,00									
15		27,27		63,64					9,09				
16		25,00		75,00									
17				100,00									
19				92,86	7,14								
20		36,84		31,58					10,53		21,05		
21		66,67	26,67	6,67									
22				75,00					12,50				12,50
23				100,00									
26	33,33			33,33					33,33				
29				23,08		15,38					61,54		
30		17,65		64,71				5,88		11,76			
31						75,00						25,00	
32		97,56		2,44									
33		54,55		45,45			2,30				94,25		
34		3,45				18,64							
38				67,80								8,47	5,08
41	100,00												
42		7,69		80,77									11,54
43		100,00											
44	3,61	86,75		3,61		2,41							3,61
45				100,00									
46	100,00												
47		9,09		77,27								4,55	9,09
52	13,33	40,00		46,67									
65		11,11		77,78								11,11	
80		100,00											
85	25,00			75,00									
93	19,18	10,96	4,11	64,38		1,37							

Fig 10. Percentages of wood species calculated on the basis of the total for each grave.

trasts sharply with the few finds retrieved by excavations of graves from the Early Iron Age. Twigs are found in graves throughout the Iron Age. In relation to the total quantity, these small fragments are more frequent in the earlier periods. This observation is also borne out by analyses from other cemeteries in the Mälaren valley (Strucke 1993 a–c).

Excavations sometimes reveal that the pyre and the grave occupied the same site during the Late Iron Age, and that the ground was prepared in some way before the pyre was built (Gräslund 1978:363ff., Petré 1984b:42ff., 202 ff.). In the Early Iron Age, on the other hand, the pyre and grave appear to have been in separate places. In those cases where the analysed charcoal was taken from a bone vessel, the risk of contamination is eliminated. In other cases the charcoal may have a large admixture of material from both older and younger activities on the site. The origin of the charcoal is thus an important question of source criticism. Apart from outright contamination, it is conceivable that the charcoal could originate from work in clearing the ground for the burial. Another possibility is that the charcoal may have come in along with

the cleaning of the cremated bones. Burnt twigs often turn white, so that it is easy to make mistakes. Finally, the charcoal may be a residue of a ritual connected with the burial, perhaps in the form of a small fire.

The analyses indicate that the composition of the funeral pyre is the result of a deliberate selection which in itself reflects special conceptions and phenomena. The source situation is still too poor to allow us to carry out more detailed analyses of the Early Iron Age material. In the Late Iron Age we find a very weak association at the Lovö grave field between the species composition and possible family structure. Oak predominates in men's graves, but the use of oak is above all chronologically conditioned. Continued work on the analyses should yield clearer indications. This could also consider the correlation between find categories, position, gender, and so on, and the different species of wood. In the same way, different combinations of wood species may conceivably correspond to particular ritual patterns.

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