In the Landscape and Between Worlds. Bronze Age Deposition Sites Around Lakes Mälaren and Hjälmaren in Sweden.

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"For some time it has been obvious that metal detectorists have been extraordinarily fortunate in locating previously unrecorded hoards. The same people have found them on a number of different occasions. Discussions with the finders have made it clear that this did not happen by chance. Long before prehistorians had realized that the siting of hoards might follow topographic 'rules', metal detectorists had reached the same conclusion. Their ability to make new finds is the clearest indication of the usefulness of taking a fresh approach to this material." (Yates & Bradley 2010a:30)

"... hardly any attention was paid to the find spots of hoards, and so a large portion of the hoards have no topographic context. The recontextualisation of hoards by means of archive studies, evaluation of old maps, site inspection and new image processing tools is an important contribution to the continued study of hoards." (Hansen 2012:42, transl. MR)

"Classifying reconstructed find spots into types and investigating their temporal and spatial distribution, as well as juxtaposing them with other aspects of the hoards, have given strong indications that the picture is at least partly determined by a patterned choice of deposition location. Thus it appears that not only the hoard contents but also their deposition sites display regularities." (Scholz 2012:87, transl. MR)

1. Introduction

This is a study of sites in their landscapes: places where Bronze Age metalwork and stone implements have been found in non-settlement, non-burial contexts. The study's goals are a) to take inventory of these sites in the area around Lakes Mälaren and Hjälmaren in Sweden, b) to investigate recurring traits in the siting of deposition, and thereby c) to develop a heuristic tool kit that may aid archaeologists in finding undisturbed Bronze Age deposition sites.

Field of Study

Archaeological sites are commonly sorted into three main categories: settlements, burials and deposits (e.g. Malmer 2002). To these, the Bronze Age of southern Scandinavia adds abundant rock art sites and a far rarer class of hilltop sanctuaries. In the study area, all except the deposition sites and the hilltop enclosures are readily identified in the field when well preserved – and vegetation permitting. While the spatial relationship between settlements, burials and rock art has long been rather well understood (Kjellén & Hyenstrand 1977; Damell 1985; Wigren 1987; Johansen 1993), the depositions are harder to tie into the wider landscape context of the society that produced them.

Several authors have published general province-wide overviews of Bronze Age settlement in the study area:

- Uppland (Up) and Västmanland (Vs): Jensen 1986; 1987; 1989; Apel et al. 2007
- Södermanland (Sö): Damell 1987; Wigren 1987
- Närke (Nä): (Karlenby 2003

All but one of the main categories of Bronze Age site around Lake Mälaren and the adjoining province of Östergötland have received monographic treatment in recent decades:

- Settlements: Ullén 1997; Borna-Ahlkvist 2002; Artursson et al. 2011; Karlenby 2011
- Burials: Victor 2002; Thedéen 2004
- Rock art: Hauptman Wahlgren 2002; Ling 2012
- Hilltop sanctuaries: Olausson 1995

The deposition sites form the exception. The bronzes themselves received solid study long ago (Ekholm 1921; Baudou 1960; Bohlin 1968; Oldeberg 1974–76; Willroth 1985; Larsson 1986), and since hardly any new finds have been forthcoming, scholars have not pursued that avenue of research further. Sonja Wigren (1987:53–62) and Susanne Thedéen (2004:68–82) have however published brief overviews for Södermanland province.

The empirical distinction between Bronze Age settlement sites, cemeteries and rock art sites has become somewhat blurred in recent years with the excavations of e.g. Sommaränge skog in Viksta (Forsman & Victor 2007), Ryssgärdet in Tensta (Hjärthner-Holdar 2008) and Nibble in Tillinge (Artursson et al. 2011; Karlenby 2011), all in Uppland. The B.A.W. is strong there: Bronze Age Weirdness (Price 2008). Yet this blurring has not touched much on the site category under study here. The only real examples I have come across is an Early Bronze Age sword pommel found in a small boggy patch at Sommaränge skog, between a cupmark boulder and the foundation of an apparently mundane coeval farmhouse, and possibly the 1902 hoard from Lilla Härnevi in Härnevi (Up: see the gazetteer). As we shall see in the following, deposition

concentrates emphatically in landscape locations where it would be difficult or impossible to either live or bury the dead.

A 2001 preliminary study by John Coles of the relationship between bronzes recovered from wetlands and Swedish rock art motifs offers interesting avenues of research that have not yet been walked to any greater extent. The theme of Christina Fredengren's useful 2011 preliminary paper coincides more closely with that of this book, as it covers Late Bronze Age wetland deposition in the Lake Mälaren area. The most important differences in our approaches to the material are her *a priori* concentration on wetlands rather than the landscape at large, and her emphasis on bones – human and animal – whose dating is ambiguous. Fredengren's blanket statement that most Late Bronze Age deposition sites "have connections with rivers or other waterways" (p. 113) appears to be an artefact of the map scale she works on. Everything in the Lake Mälaren area is near water if you map the entire lake basin on a computer screen (as seen for instance in Fredengren's characterisation of the Härnevi hoard's siting, pp. 115–117, that I believe to be mistaken). In any case, though we share considerable material, our goals differ. Her paper aims to study a) "what role the link between depositions and the watery landscape would have had [during] the transition between the Late Bronze Age and the Early Iron Age" but also (like myself) b) "in what type of water the various deposits were placed" (p. 110).

Research is severely hampered by the facts that a) deposited objects are hardly ever found any more, and b) during the period when they were found, scholars were hardly ever involved in their retrieval. This is because Swedish Bronze Age deposition sites are not identifiable on the surface: most are in bogs, lakes and streams, where few archaeologists have been able to do any directed large-scale fieldwork. And the main era of wetland reclamation for agriculture in Sweden ended before World War II (Runefelt 2008). This happened about the time when tractors replaced horses, placing the farmer in front of the plough where he can no longer see what it turns out of the ground. Finally, Swedish law effectively prevents the growth of any significant metal-detector hobby (Rundkvist 2008; Svensson 2014). To my knowledge, the last time a multi-object non-grave bronze deposit surfaced in the study area was in 1986 (at Sigridsholm in Lunda, Up).

Furthermore, data coverage is patchy, inconsistent and difficult to map. Digging or dredging in various landscape situations can be seen as a kind of experiment as to whether a Bronze Age deposit will be found. Yet we only have information about a small subset of the cases where something was in fact found, and none about the innumerable experiments that have turned out negative.

Goals and Methods

This book is intended as a piece of landscape archaeology, a field and practice that has been recognised under a name of its own since the 1970s in Northern Europe (Aston & Rowley 1974) and thrives to this day (Wagstaff 1987; Ashmore & Knapp 1999; David & Thomas 2008; Rippon 2012; see also the journals *Landscape Research*, 1976 onward; and *Landscapes,* 2000 onward). I seek knowledge on the landscape scale: not on the artefact level, not on the level of the province-wide distribution map, but on a scale of hundreds of meters, where you can see from one studied landscape feature to another and walk between them in an hour or two. Rather than treating the find context as an attribute of each find, I view finds as attributes of the places under study. This means that I am primarily interested in finds with a reasonably detailed spatial provenance, those that can be tied securely to a place. And I aim beyond the anecdotal, to identify regularities, Bronze Age rules of landscape.

Ultimately, I envision a predictive model, being a set of analytical tools that would allow archaeologists to go out into the landscape like homing missiles, as it were, and

find Bronze Age deposition sites without the aid of farmers, peat cutters and dredging crews. Then we could learn what sort of materials and structures those finders of great-grandfather's generation left on site when they selected the objects they handed in to the authorities. And we could get a solid palaeoecological background for deposition events. With such knowledge, we would be in a much better position to say how Bronze Age deposition was performed.

Reading debate pieces on methods in landscape studies, I have found myself siding with Andrew Fleming (1999; 2006; 2007) rather than Christopher Tilley (1994; 2010). Personal "phenomenological" impressions are a) impossible to communicate clearly, b) of indeterminate relevance to ancient personal impressions, and so should not in my opinion be afforded any central place in scientific discourse. But as Fleming and Tilley both agree, this not to say that a landscape archaeologist can stay indoors. In order to understand a landscape well enough to speak clearly about its characteristics and formulate testable hypotheses, an archaeologist must traverse it, preferably on foot.

In a sense, this is also study of structured deposition. But as Duncan Garrow (2012) points out, that term is mainly used for the differential (and possibly meaningful) distribution of various find categories across settlements and monumental sites. Garrow's study (p. 94) sets Bronze Age metalwork deposition aside as a field of its own, and I too avoid the term “structured deposition” here. So also with the expression “placed deposition”, which has a similar meaning but is redundant, deposition after all meaning “placement”.

Previous Work In Other Regions

Northern Europe's metalwork hoards and single finds are in themselves perennial subjects of inquiry and publication, as are individual find spots and their regional or province-wide distribution. But the literature about their landscape-level siting, as studied in this book, is of quite manageable size.

The field can be said to open with Walter Torbrügge's seminal 1971 study of river finds in Central and North-Western Europe. He demonstrated that most of that area's innumerable Bronze Age river finds must have been as intentionally placed as any find from a bog or a spring. A main argument of his was that certain widespread object types concentrate in certain river stretches in a manner that chance losses would never be. Torbrügge argued in terms of *Deponierungsregeln*, “rules of deposition”, though on the regional scale rather than on the landscape scale pursued here. Still, he was fully aware of “motive[s] for deposition that must be understood with reference to the qualities of the site” (p. 21). He commented at length on springs, river mouths, islands, fords and bridges (pp. 61 –71), and more briefly on off-river deposition sites including wells, ponds, lakes, sea inlets, bogs and various dry site types (pp. 77–90).

Wolf Kubach (1983; 1985) looked at the landscape siting of find spots in Lower Saxony, Westphalia and Hesse, again largely in or near rivers. He found (1985) that in some periods the composition of hoards is more consistent than their siting, and argued that regardless of siting the deposition custom has a “non-secular, in the widest sense religious or magical background” (1983:149). Kubach (1985) also notably suggested that the interesting divide in his study area is not between the single find and the multiple object hoard, but between finds of one-two-three complete objects on one hand, and large scrap metal depositions on the other, particularly considering that every stray single object in the museum collections may originally have been deposited along with a few additional ones.

Heiko Scholtz (2012) offers a classification scheme for deposition sites in Mecklenburg-Vorpommern, covering mainly various types of wet location, and studies the different emphases on the various site categories over the periods of the Bronze Age.

For instance, hoards of Per. IV are particularly frequent in post-glacial kettle holes and other small bogs.

Regine Maraszek (2012) examines the landscape situation of Late Bronze Age hoards in Saxony-Anhalt and Thuringia. She agrees (p. 114) with Kubach that deposits of single and multiple objects must be viewed in the same context. The find spots include wet environments, banked enclosures and settlements, but no clear rules of deposition have as yet been identified.

Denmark's various landscapes are very different from the study area in terms of the topography and shoreline displacement. Karl-Heinz Willroth's 1985 study of Early Bronze Age deposits on the Danish isles and in Sweden south of Svealand mainly operates on a high, regional scale level. But Willroth also looked at a simple classification of find spots, documenting the varying proportions of grave finds, wetland finds and dry-land deposits across time and space. One local landscape parameter that he looked at briefly was the (generally rather large) distance between deposition sites and burial mounds (e.g. p. 98). All later relevant work regarding Denmark that I have found deals with northern Jutland. Lise Frost (2008), taking her inspiration from the same writers as myself, Bradley and Fontijn, has blazed a trail here with her studies of Late Bronze Age deposition sites on the local level. She demonstrates that they are generally dispersed in wet environments but also form concentrations in certain parts of river systems, large bogs or clusters of small bogs. No generally applicable landscape rules emerged from Frost's work. But see her comments on landscape in papers on individual hoards (Frost 2003; 2008; 2010). Boddum et al. 2011 is an anthology of similar case studies.

In England and elsewhere, Richard Bradley's 1990 book *The Passage of Arms* (2nd ed. 1998) has proved influential with scholars thinking about deposition and landscape, even though it operates mainly on a high, Europe-wide scale level. Looking at south-east England, David Yates & Richard Bradley (2010a) find that the deposition sites cluster along watercourses and near settlement indicated by lithics scatters. In another paper (2010b) they look at the Fenland in Cambridgeshire, noting that just like in the Netherlands, many whole weapons were deposited in rivers while fragmented ones are found singly on dry land. Here, hoards are often found in wetlands away from the rivers. Deposition is particularly dense near coeval settlements along the fens' edges and causeways across them to the Isle of Ely.

In Poland, Wojciech Blajer has documented (2001) and re-tested with newer data (2008) the variation across time and space of wetland metalwork deposition. It is particularly common in northern Poland from the 16th century BC onward. Marcin Maciejewski (2013) has researched and analysed the find spots of north Polish hoards in greater detail and noted a tendency for them to occur on the edges of settlement clusters, about a kilometre from the nearest known coeval settlement. He thus interprets the deposition sites as boundary markers.

In Scotland, Trevor Cowie (2004) has looked at the find spots of flat and flanged axes. Unlike the Scandinavian sites, the Scottish ones are attracted by mountaintops, with many depositions made on or next to spots with a commanding view of the surrounding landscape.

In Ireland, Katharina Becker (2013) has looked at landscape siting as one facet of a wide-ranging study of metalwork deposition. She finds that wet contexts predominate, with i.a. the weaponry particularly favouring rivers. In line with the aims of this book, she concludes that “Type-specific depositional patterns reflect rules that were in place for different types of object” (p. 31).

As for other more nearby regions in Sweden and its neighbouring countries Norway and Finland, I have not found any published studies there of this kind. In Finland bronze is just generally rare in the period under study.

Sacrifice? Retrievable and Irretrievable Deposits

Until now, I have spoken only of "deposits", avoiding the word "sacrifice". Scholars have long distinguished retrievable deposits, "hoards", from irretrievable permanent deposits, "sacrificial/votive offerings" (see Berggren 2009; 2010 ch. 2 for overviews). The idea is that dry-land hoards are buried secretly and temporarily for mundane functionalist reasons, while wetland offerings are disposed of permanently to communicate with the gods and often for reasons of ostentatious display. (Rychner 2001 and Needham 2001:290–291 offer a caveat regarding deposition in shallow water whence objects could be retrieved.) While this dichotomy is an empirical reality (Levy 1982:17–25, 43–44), it is doubtful if the two classes of find should really be seen as exponents of two different modes of thought when we are dealing with a pre-monetary prestige economy and a pre-scientific world-view (Karsten 1994:30–31; Bradley 2005:145–164; Rundkvist 2011a:61–62). In other words: it is true that some of these finds could have been retrieved, and it is true that we often see different object types in those contexts than we do in bogs and rivers, but it is uncertain (and possibly untestable) whether the two classes of find were really deposited for very different reasons. As Katharina Becker (2013:32) puts it, "It is only by breaking through the artificial boundary between the profane and ritual concepts that a coherent interpretation of the [type-specific deposition] practice in general … becomes possible."

As the following study will show, dry-land deposition was rare in the area we are dealing with here, which makes the issue of retrievability less interesting. Nevertheless pursuing that point, I have in fact yet to see a convincing argument for why we should interpret a given retrievable pre-monetary, pre-state-society metal hoard as mundane from a modern perspective. Hans-Jürgen Hundt (1955) argued extensively against the idea. Bradley (1987) compared Late Bronze Age and Viking Period metal deposition customs and found them to be largely similar. He did not touch upon people's motivations for depositing metal in either period, but emphasised that during its use life an object could play a number of different roles in both periods, indicated particularly by find combinations and degree of fragmentation. Making the same inter-period comparison, Christoph Huth (2009) agrees that the two periods' metal depositions are similar in most respects but points out that they have been interpreted quite differently. Huth hints that he favours a mercantile interpretation for the use and deposition of both classes of finds (cf. Huth 1996). I disagree when it comes to the deposition, and thus I take what is in fact the long-accepted position on the issue in Scandinavian archaeology (Worsaae 1866:313 ff; Willroth 1985:219–243; Bradley 1998:15–16). Little metal – Bronze Age or Viking Period – was buried for mundane reasons, and even less was allowed to remain underground for such reasons. For instance, the fact that every single farmer on 11th century Gotland seems to have left silver under the floor boards (Östergren 1989) cannot be explained with reference to sudden death or senile dementia in the owners. Hiding silver and never retrieving it was a cultural norm on the island.

Klavs Randsborg (2002) points out that precious metal was quite often cached in wet contexts in Denmark during the wars of the 17th century, and obviously for reasons that had nothing to do with the supernatural. To my mind however this milieu – a monetised proto-capitalist state ravaged by repeated large-scale military invasion – is too different from e.g. Bronze Age Svealand for any comparison to be very illuminating.

If we learn how to find undisturbed deposition sites, then the debate over sacrifice versus mundane safe-keeping may one day become transformed by detailed information on how people placed these things. As Stuart Needham (1989:232) has noted, the few cases where information survives about bronze objects placed in intricate arrangements, and sometimes along with other less collectible materials, suggest "that deposition was not only deliberate, but intended to be permanent".

It is in any case important to interpret the reason that hoards were assembled separately from the reason that they were ultimately buried or sunk into water. This distinction is to my knowledge never made in the literature. Following on a long debate about “founder's hoards”, Bradley (1998:118) believes that the casting jets and fragments of slag found in certain hoards would most likely not have been accumulated for sacrificial purposes. And indeed I see no reason to question the idea that scrap metal was collected for recasting. But bear in mind that much of the collected scrap did demonstrably become recast, as seen from the alloy composition of Bronze Age metalwork (Northover et al. 2001; Bray & Pollard 2012). Bronze Age people probably did not associate scrap metal primarily with holes in the ground. This means that the buried scrap-metal hoards that we know of are ones that received unusual treatment and were not allowed to walk the normal path of their kind. Scrap metal was one kind of valuable that one might part with to communicate with supernatural powers. The owner of an unremarkable, haphazardly put together bag of scrap might just one day decide to sacrifice it.

But perhaps scrap for deposition was sometimes in fact carefully selected. Scrap metal hoards by definition contain many fragmented objects, but the pieces rarely add up to complete artefacts. Needham (2001:288) argues that this may be due to a custom similar to one known e.g. from ancient Greece, where an animal was sacrificed and only certain parts that make poor eating were burnt as offerings to a god (a sleight of hand taught to humanity by Prometheus the trickster). Perhaps most scrap metal hoards from Northern Europe contain the gods' share of a much larger collection of objects that were re-cast for renewed use. And Svend Hansen (2012:27) agrees, pointing out that at Greek sanctuaries of the Geometric period (9th and 8th centuries BC), tripod cauldrons dedicated to the divinity were often re-cast, with only a few selected pieces taken aside and deposited in sacrificial wells or middens (Kyrieleis 2006:97). Though this sacral metal recycling is not mentioned in Greek writing, the ideas behind the animal sacrifice that took place at the same sites are well documented in coeval written sources. The Per. VI hoard from Hassle in Glanshammar (Nä) was housed in a tripod cauldron from the Pontic Greek area, thus documenting contact at least through intermediaries between the very milieu Hansen refers to and our present study area. But we have no clear-cut scrap hoards here, though several contain a few incomplete objects among the complete ones.

Then we have the unfinished objects, often found as collections of identical pieces and seen by scholars as stock parked temporarily by the bronze workers themselves. Anja Endrigkeit (2010:93) notes that the objects' unfinished status actually need not indicate that they were deposited temporarily for mundane reasons. She does however (echoing the founder's hoard concept) believe that no casting moulds, metal bars or casting jets were parted with for supernatural reasons. And there I disagree. Either way, the study area's deposition sites have not to my knowledge yielded any unfinished objects, though quite a few are in mint condition.

Joanna Brück (2001:157) suggests that the dry-land deposits represent metal given to the earth in return for goods taken from the earth, including grain. Whether or not the earth was envisioned as a personified deity here would be difficult to tell. Joakim Goldhahn (2010) offers a similar interpretation where metalwork would have been deposited to compensate for the taking of clay to make pots and casting moulds. This may be so. Note, however, that in Scandinavia it cannot have been evident to most people that metal had subterranean origins. Bronze came from the packs of seafarers, not from the earth like clay and grain did.

On the Continent there are interesting object types that must be seen as specialised votive forms of a common depositional item, such as the Geistingen type of socketed axe that is too thin-walled for use and often impossible to fit with a haft (Fontijn 2002:160–161). Fontijn suggests that their introduction means that ideas about the

proper use history of an object for deposition have changed: no longer must the axe thrown into the lake come with memories attached. I would go further: such finds can be taken to mean that our currently fashionable ideas about artefact biography were never really that important in those cultural contexts. Perhaps the important thing was always simply to deposit a (commoditised) axe. We should reserve interpretations about the importance of use histories for cases where we can document a strong correlation between geographical origin and the state of wear of an object type on the one hand, and the manner and location of its deposition on the other.

Finally, on the subject of sacrifice, I do not observe the distinction made by Henri Hubert and Marcel Mauss ([1898] 1964:11–12) between that term and "offering". Here sacrifice, to quote the *Concise Oxford Dictionary* (1990), is simply "the act of giving up something valued for the sake of something else more important or worthy".

Ritual and Rationality

The debate about retrievable and irretrievable deposits is intimately connected to the distinction between ritual and functionalist or mundane or domestic behaviour. As Richard Bradley has argued at length (2005), these terms are not very helpful when dealing with prehistoric societies. One may easily think that "ritual" equals "irrational" and thus "functionally inexplicable". Conversely, "domestic" would then equal "functionalist". But it is impossible to be more rational than what your level of knowledge about the world allows. This has nothing to do with the once-fashionable epistemological relativism where there was talk of "different ways of knowing". Simply put, in the pre-scientific era that makes up almost the entire history of human culture, people did not know very well what was real and not. It was – and is to some extent still – extremely difficult for us to determine what sort of actions would produce reliable effects. Most likely, people during prehistory believed that everything they did was functional. (Joanna Brück 1999 offers a fuller treatment of this issue that is oddly hostile to rationalism but nevertheless reaches similar practical conclusions for scholars.)

If everyone believes in the Lady in the Lake and atheism is unheard of, then it will appear entirely rational to make sacrifices to her. In fact, doing so may produce solidly beneficial effects – not thanks to any divine intervention, but because it impresses the neighbours. This view coexists easily with some level of modern-style economic rationality where rare imported goods such as bronze would be valuable and prestigious and thus apt as sacrificial gifts. And conversely, it means that when we see evidence of people acting in mundane, sensible ways that we can easily explain from a modern functionalist perspective, then we are nevertheless probably not dealing with behaviour that prehistoric people saw as belonging to any separate category of its own. If you really believe in gods, then sacrificing to them looks as sensible and/or ritual as digging deep post-holes to keep your house from collapsing. With the exception of people clinging to old belief systems, every age acts upon its best available knowledge.

My own interpretation of why the deposits were made and left in place is that all were certainly left for reasons that appeared rational to people at the time. But very few were left for reasons that would make any functional sense to someone with a scientific world view. A belief in the supernatural was clearly involved, and so the deposits may rather blithely be termed "sacrificial". We will most likely never know whether modern scholars would classify the fictional entities to which the sacrifices were directed as gods, demons, spirits or ancestors. Thus Hansen (2012) speaks simply of "gifts to the imaginary powers".

Accepting an argument of Knut Stjerna's based on Old Norse literature and adding an interpretation of recent folklore about elves, Gunnar Ekholm (1916) was emphatically convinced that the deposits were intended as gifts to the ancestors. He believed that

objects were deposited in wetlands because the mists there were seen as shades of the dead. Hundt (1955) was similarly convinced that many deposits were *Totenschätze*, “treasures of the dead”, that is, basically grave goods deposited elsewhere than the bodies of their owners. I find it hard to share either Ekholm's or Hundt's conviction.

But Tacitus tells us that people believed in gods in 1st century AD Northern Europe, and the Mediterranean written evidence for godly beliefs at the time of the Scandinavian Bronze Age is extensive indeed. Several scholars have in fact argued recently that Bronze Age depositions in the area were directed to gods known from the Norse pantheon of the Late Iron Age and/or surviving theophoric place names (Zachrisson 2004; Forsgren 2008; 2010; Fredengren 2011). I am more skeptical about oral tradition's ability to maintain divine characters with recognisable traits over such a long time span. I believe that Bronze Age gods were worshipped in Scandinavia but that Snorri would not have recognised them.

Note that "ritual" does not mean "random". Rituals, while irrational to someone with a scientific world-view, are in fact anything but random. It is part of the term's definition that a ritual is structured, even scripted, and proceeds according to rules that allows it to be repeated in a recognisable form that the participants and audience accept as traditional (cf. papers in Kyriakidis 2007). And for this reason, archaeologists should not dispense with the concept of ritual action. As I have argued above, almost all human action during prehistory was very likely perceived as rational in its time. But much of it is nevertheless likely to have been ritualised.

In any case, for the purposes of this study, the rationale behind the deposition of metalwork and stone implements is not a central issue. The custom began long before our period and ended long after it. Indeed, at a few sites within the area of study (such as Hyndevad on River Eskilstunaån, Sö) we have continuity of deposition from the Neolithic though the Bronze Age and on afterwards. Yet none of the Continental written sources from the end of the deposition era comment on the custom, even though it was current in Spain and Italy (Bianco Peroni 1980; Ruiz-Gálvez-Priego 1995; van Rossenberg 2003 w. refs) as well as across Northern Europe. The ubiquity and longevity of the custom stand as a silent conundrum. In all likelihood though, people did not think about deposition in exactly the same way over those millennia or indeed over the twelve centuries of the Scandinavian Bronze Age. Nor across the geographical range of the South Scandinavian Bronze Age Culture, at any given time. As indicated by the book's title, however, I tend to see the deposits as remains of acts intended as communication with another world. Whether this interpretation holds is not actually an important issue here given my landscape-archaeological heuristic goal.

[An aside: as mentioned, the earliest narrative writers in Europe, Homer and Hesiod and their immediate successors in Greek literature, appear unaware of the idea of wetland sacrifice. But at about the same time, King Sennacherib of Assyria is making occasional sacrifices in water and commenting on them in cuneiform inscriptions (Dalley 2013:99–101). In c. 688 BC, the king inaugurates a major set of canals and aqueducts designed to bring mountain-stream water to Niniveh. In the project's main commemorative rock inscription at the source near Bavian he describes offering precious stones, gold figurines of stream-living animals and perfumes to Ea and Enkidu, the two appropriate gods. And once while on campaign in the marshes of southern Mesopotamia, Sennacherib suddenly finds his army's camp disastrously flooded. He responds by sacrificing a boat, a crab and a fish of gold to Ea by way of dropping them into the water, as his annals record. Note that the king mentions neither tools, weaponry nor jewellery, which makes the Assyrian custom a poor parallel to what we see in Scandinavia. But it does document that during Per. VI there was a Mesopotamian belief that the gods of water could usefully be interacted with though sacrifice in water.]

Artificial Scarcity and Individual Agency

Colin Burgess (1979:275–276) suggested that the many hoards from the end of England's Bronze Age are a symptom of low demand for bronze after the adoption of iron working. “The only sensible thing for a bronze-worker to do with his stock would be to bury it until it was needed or demand picked up.” Regarding the last peak of bronze-sword deposition in English rivers, he argued that “For craftsmen struggling to cope with the collapse of the bronze market, this [bronze swords made mainly for display and votive purposes] would have been one way of staying in business and using some of their massive bronze surplus.” (1979:278).

At about the same time a similarly economic mode of thought led Michael Rowlands (1980:44) and Kristian Kristiansen (1981:245) to suggest a more general model for such peaks in bronze deposition, involving the concept of *artificial scarcity*. The Bronze Age elite's social position very likely rested on control of trade (be it mercantile or prestige gift-based) in scarce commodities, notably bronze. The artificial scarcity model notes that the system would break down and the elite lose their advantage if bronze became easy to come by. And so it suggests that permanent deposition in graves and hoards was a way to keep the bronze supply down and ensure the continued scarcity – and value – of bronze. Thus Rowlands (1980:44; 1998:176), "Burying large quantities of it [bronze] may have been the only means of maintaining some kind of scarcity value", and Kristiansen (1981:245), “By removing scarce and prestigious goods from circulation their value could be regulated and controlled ...”, and Kristiansen again (1998:79), who suggests that it could be that “hoarding represented a ritualised way of getting rid of seasonal overproduction, to prevent inflation ...”.

I find this model lacking in explanatory power. Irretrievable deposition in lakes and rivers did of course have the described effect on the economic system to some extent, though it is difficult to gauge what percentage of the available metal left circulation in such a manner. But it is in my opinion out of the question that people had that goal in mind when they deposited bronze. Because to the individual aristocrat who controlled bronze, scarcity was only desirable when it happened to *somebody else*. No-one would ever let go of their own bronze for the common abstract good of the aristocratic system. Bradley (1998:38) offers similar criticism.

It is not clear from my reading whether Rowlands and Kristiansen believed that this system-hygienic effect was consciously intended or just emerged somehow. Bradley (1982; 1984:105) suggested that people's motivation was in fact *potlatch*-like competitive destruction of wealth. And Kristiansen agrees: on the subject of certain huge Late Bronze Age axe deposits in France, for example, he writes (1998:150), "This destruction of wealth is so remarkable that we must assume overproduction and inflation, leading to a spiral of desperate internal competition and ritual destruction." To paraphrase, then, people sacrificed many axes because axes had become common and it no longer impressed the neighbours much if you only sacrificed a few.

This is a Marxist perspective where a society's economy lives a life of its own and people are cogs in the machinery. But the artificial scarcity model cannot explain the conscious reasons that people chose to deposit bronze in the first place (Fontijn 2002:278). If we asked Bronze Age people *why* they made sacrifices, they would not reply “To make bronze scarcer” or “To impress the neighbours”. I believe that the most common answer would in all likelihood be something along the lines of “Because it pleases the Lady of the Lake”.

Site Continuity vs. Continuity of Site Selection Criteria

David Fontijn (2002:260) points out that repeated deposition in the same bog or river stretch over centuries presents a bit of a conundrum since the deposits would not have left any visible traces to attract subsequent groups of ritual celebrants. He argues that

the explanation is oral traditions about deposition sites: they may not have looked like much, but people told and re-told stories about what had once happened there. With Stijn Arnoldussen, Fontijn has later suggested another explanation that appears more likely given the long periods involved: the traditions may not have conveyed specific memories of individual sites, but instead transmitted general landscape rules governing deposition (Arnoldussen & Fontijn 2006; cf. Fontijn 2007). These are what this study seeks to identify.

In this view, a person who sought an appropriate place to deposit objects might not know whether or not anyone had done so before at a given site, but might find that it fulfilled traditional ritual demands. The idea might not be "This is a known place where the Lady of the Lake has been contacted before", but "This is the *kind* of place where She may be contacted". Such a perspective might explain the pattern Fontijn (2002:260–263; 2012) sees in Limburg, where Bronze Age deposits are found in unspecific and rather extensive zones in the landscape, not at discrete places. If the landscape rules of deposition are not strongly determinant, then deposits will tend to spread out. But as Fontijn points out (2002:275), the rule cannot have been as simple as "Any wet place will do". And as I argue below, in the landscape of the study area there were apparently a few long-lived attractors, notably river rapids, that received repeated depositions.

Deposit Diversity

Beyond the baseline wetland theme Bronze Age deposition sites in the study area are highly diverse. We cannot make general statements about all Bronze Age deposition sites. There are many kinds, and it is highly likely that they follow different landscape rules (cf. Bradley 2000:53; Fontijn 2002). The study area is not very rich in finds of this kind compared to e.g. Denmark and Scania, and so we cannot operate with too many categories. But the following distinctions are in my opinion indispensable.

Single vs. multiple episodes of deposition. Accumulated finds represent sites that have attracted deposits repeatedly. I view them as key to the issue at hand.

Single vs. multiple objects. As a rule, the finds that mark the sites under study are single objects. Multi-object single-episode deposits are rare and tend to contain unusual object types.

Chronology. The Swedish Bronze Age lasted for almost twelve centuries. We must allow for change over this time span and make good use of the typo-chronology established by earlier research.

Functional and material categories. Weaponry, jewellery, tools and metalworking debris; bronze and stone.

Chronology and Typological Terminology

The chronological backbone of this study is Oscar Montelius's 1885 division of the Scandinavian Bronze Age into six periods (cf. Montelius 1917), as later elaborated by Evert Baudou (1960) and Andreas Oldeberg (1974–76) for the study area. As with most archaeological chronology, the relative sequence of types and periods established in the 19th century still stands with small corrections, while the absolute dates have become much clearer thanks to radiocarbon. I accept the dates suggested by Karen Margrethe Hornstrup et al. in a 2012 paper (tab. 1:1), based on a Bayesian analysis of radiocarbon dates for cremated bone and dendro dates for Danish oak log coffins. Period shifts may have occurred somewhat later in the relatively peripheral study area than in Denmark, but this is probably on the scale of decades, not quarter centuries. To aid comprehension, tab. 1:2 offers a glossary of the most common artefact types involved.

Table 1:1. Bronze Age absolute chronology according to Hornstrup et al. 2012

Early Bronze Age (EBA). 1700–1100 cal BC (600 years)
- Per I. 1700–1500 (200 years)
- Per. II. 1500–1330 (170 years)
- Per. III. 1330–1100 (230 years)

Late Bronze Age (LBA). 1100–530/20 cal BC (575 years)
- Per. IV. 1100–950/20 (165 years)
- Per. V. 950/20–800 (135 years)
- Per. VI. 800–530/20 (275 years)

Table 1:2. Glossary of the most common artefact categories

English	**Swedish**	**Swedish 19th c.**	**German**	**Date**
Flanged axe	Kantyxa	Skaftcelt	Randbeil	Per. I
Shaft-hole axe	Skafthålsyxa	Skafthålsyxa	Schaftlochbeil	Per. I–II
Palstave	Avsatsyxa	Pålstav	Absatzbeil	Per. II
Socketed axe	Holkyxa	Hålcelt	Tüllenbeil	Per. II–VI
Sloping-butt stone axe	Nackböjd yxa		Nackengebogene Steinaxt	LBA
Orthogonal stone axe	Rombyxa		Rechtwinklige Steinaxt	Per. IV–V
Rhomboid stone axe			Rhombische Steinaxt	Per. V–VI
Reverse-twisted torque	Wendelring	Wendelring	Wendelring	Per. VI

2. Overview of the Data in Context

Scope and Delimitation

As we have seen, deposits form a slightly fuzzy category that is at heart defined in negative terms: not found in graves, not found in culture layers formed by daily life at settlement sites. Thus here too: this study treats specialised deposition sites, not depositions made at settlements (cf. Borna-Ahlkvist 2002:91–98), at grave monuments or at hilltop enclosures. When known more specifically, the environment tends to be wet: often lakes, streams, bogs and damp meadows. These sites deserve separate treatment as they stand out from other contexts through the types and quality of the objects found there, suggesting that Bronze Age people saw the deposition sites as a distinct category of place – or as several.

Data collection required of me to face the problem of stray finds. Most Bronze Age items in the museum stores retain only the names of a hamlet and a parish to identify where they were found. They cannot be disregarded. And so I have followed a simple rule. I only study object categories that have been found in a wet context or a multi-object hoard in the study area. Thus, for instance, I do not comment on stray bronze tweezers or razors. But I do keep track of Late Bronze Age stone axes despite the fact that most are stray finds. As Kubach (1985:179) put it, and I translate: "If for instance certain find categories only occur as single finds or predominantly in watery contexts, it seems reasonable in cases where no other information is at hand to classify all finds of these categories as depositions." And as Hundt (1955:97) noted, if we study stray finds "... it is possible that a few inadvertently lost pieces will incorrectly be classified as deposits, but this would skew the general picture of deposits in bogs and on dry land less than if all single finds were set aside" (my translation).

Given these criteria and the need for secure Bronze Age dates, I have covered only objects made of bronze and stone, with an additional few gold finds. Pottery, quartz and quern rubbers mainly feature at settlement sites. Sven-Gunnar Broström and Roger Wikell have pointed out three sites to me in Södermanland where great numbers of quern rubbers have been collected next to settlements on the edges of drained wetland (at Söderby in Salem, Hässlingby in Österhaninge and Gärtuna in Östertälje). But I have not pursued that find category closer.

As for geography, we are dealing with four of Sweden's Medieval *landskap* provinces: Uppland (where Uppsala is), Västmanland (where Västerås is), Närke (where Örebro is) and Södermanland (where Eskilstuna and Södertälje are). The country's capital Stockholm sits on the border between Uppland and Södermanland. This study area equals the current *län* provinces of Uppsala, Stockholm, Västmanland, Örebro and Södermanland. Excluding a few outliers, the sites I have been able to pinpoint for the purpose of landscape study are all within a 175 km (W–E) by 160 km (N–S) rectangle.

Avoiding Late Neolithic Axes and Daggers

The Late Neolithic's characteristic flint daggers and stone shaft-hole axes may have survived for some time into the Early Bronze Age. No distinct type of stone axe in the Late Neolithic tradition has so far been assigned a firm, exclusive and widely accepted Bronze Age date though many scholars have tried. Following Per Lekberg (2002:85–86), I have disregarded such axes here.

As for the daggers, Jan-Elof Forssander's (1936) and Ebbe Lomborg's (1975) type VI is a fairly good Bronze Age candidate. But apart from Early Bronze Age find combinations it also has several secure combinations with dagger type V which is diagnostic of the later Late Neolithic. Torsten Madsen (1978) placed most of type VI's production as well in the Late Neolithic. Jan Apel (e-mail 11 October 2012) on the other hand places the type entirely in the Early Bronze Age (cf. Apel 2001, where this is left

somewhat ambiguous). The present study area was peripheral both to the dagger production centres and to the bronze sources and so can be expected to have lagged behind Denmark and Scania in the type repertoire. Thus following Apel I have placed type VI flint daggers in period I–II of the Bronze Age.

Apel has kindly given me a copy of his dagger database. I rely entirely on his classification. He lists 55 daggers from the study area. None is in a closed find combination with any Bronze Age object. The only stone implements reported to have been found in closed deposition contexts with Bronze Age metalwork in the study area are a flint sickle in a Per. II hoard from Oskarsborg in Ärentuna (Up), and, oddly enough, a Middle Neolithic battle axe found with a Per. I flanged bronze axe under a boulder at Frommesta in Ekeby (Nä).

There is little information about find contexts for the 55 flint daggers. 40 are in the SHM's on-line inventory database. 34 of the 40 retain no context information whatsoever beyond the names of the hamlet and parish. As flint is not reliably changed by a wet environment, we cannot know if those daggers are relevant to us here. But five retain information about having been found on reclaimed wetland or lake beds, one from Grindstugan in Ludgo (Sö) “at a depth of 4–5 feet, where there were also black oak trunks”. This shows that flint daggers were in fact deposited in the area during the Early Bronze Age, and so I have used the six SHM daggers with context information in this study.

Overview of the Database and Data Collection

I have disregarded finds recorded no closer than to province or parish. This left me with about 370 named hamlets or crofts that have each yielded at least one relevant documented find. These properties have given 143 finds that are recorded at least to land parcel within a hamlet, forming the core material of the study. Of these 143 finds, finally, 51 have recorded find spots within a land parcel to an accuracy of a few tens of meters or better.

87% of the finds with hamlet-level or better provenance are comprised of only one object, usually a socketed axe, usually from the Late Bronze Age. There are only 30 hoards of more than two objects, plus six accumulated multiepisode sites, mainly river rapids.

Most of the find provenances used in this study come down to the present day as names of hamlets in parishes, and occasionally land parcels in hamlets. A crucial requisite for the work, and probably an important part of the explanation for why such a study has not been undertaken decades ago, is the recent availability of on-line databases with scanned and digitised archive materials. Until recently, it would have taken a scholar days of travel between archives in different cities just to pinpoint a single find spot for an early museum acquisition. Moving on from there to locate relevant nearby rock art etc. and place that single find spot in relation to shoreline displacement would have taken additional days. And this presupposes that we were dealing with the era of the photocopier, when scholars can easily bring map copies with them from archive to archive. In the age before that technology's widespread availability, the task would have been even more difficult.

I have been able to do most of the data collection from my desk, which allowed me to pinpoint and classify several sites a day. I have used the following on-line resources, and my gratitude goes out to the people who have created the sites, update them and keep them on-line.

- The Swedish History Museum's inventory. mis.historiska.se/mis/sok/sok.asp
- The Heritage Board's sites & monuments register. www.fmis.raa.se

- The (now sadly defunct) nationwide shared map engine of the County Administrations. www.gis.lst.se/lanskartor
- The Survey Office's historical maps. lantmateriet.se/Kartor-och-geografisk-information/Historiska-kartor/
- The Survey Office's current place-name map engine. kso.lantmateriet.se/kartsok/kos/index.html
- The Geological Survey's shoreline displacement and deglaciation map engine. maps2.sgu.se/kartgenerator/maporder_en.html
- The Institute for Language and Folklore's place name archive. www.sofi.se/ortnamnsregistret
- Swedish Wikipedia. sv.wikipedia.org
- Eniro telephone directory. eniro.se
- Google. Surprising things can be learned by simply googling the name of the parish and hamlet where something was found. www.google.com

In addition I have travelled to museum stores in Uppsala and Hallstahammar to read off-line inventory ledgers and card files. Staff at museums in Örebro, Västerås, Enköping, Uppsala, Stockholm, Södertälje and Nyköping have kindly answered e-mail queries. Several local historical societies (Sw. *hembygdsförening*) have also been very helpful in locating places whose names are in the museum ledgers but not on the maps.

Shoreline Displacement, Site Classification and Bronze Patina

Since deglaciation about 8000 cal BC, the entire study area has risen continuously due to rebound of the dent formed by the weight of the inland ice. The rate of this rise has not been uniform but has decreased over time. And the north-west edge of the study area rises faster than the south-east edge, because it is closer to the centre of gravity of the inland ice. Thus the whole area tilts slowly to the south-east over the centuries. Meanwhile, the sea level fluctuates independently of the land's behaviour. The sum of these motions is a rather intricate history of shoreline displacement that forms a classic field of study within quaternary geology (recently, Plikk 2010; Sund 2010; Risberg & Alm 2011).

Rather than attempting an amateur landscape reconstruction for each site and each period of the Bronze Age, I have used three of the Swedish Geological Survey's detailed on-line nationwide ancient shoreline maps to characterise them. These maps deal not only with the sea but also with the likely behaviour of inland basins (modern lakes, bogs and river valleys) as the land has risen and tilted. During the Bronze Age, Lake Mälaren was an inlet of the Baltic Sea filled with a dense inland archipelago. Lake Hjälmaren was already a lake, as it remains today.

The Geological Survey offers maps with 1000-year intervals. For Per. I (1700–1500 cal BC), I have used the SGU map for 2050 cal BC. For periods II–VI (1500–520), I have used the map for 1050 cal BC. And for period VI, I have additionally looked at the map for 50 cal BC in cases where I have needed to gauge whether or not a given basin is likely to have become isolated from the sea at that time.

When classifying the landscape location of a site, I have paid little attention to if the finds look as if they have spent a lot of time under water or peat, and much more to how far the find spot was from water at the time of deposition. Most sites are in Bronze Age water or so close to the shore that it is difficult to tell. And though the vertical distance between the deposition site and the water's surface was in a few cases considerable – e.g. at Oxbroberget in Helgesta (Sö) and Marielund in Funbo (Up) – I have classified these as lake sites rather than keep them apart as a small class of lakeshore hilltop site.

Bronzes that retain a metallic sheen with black or brown staining are known to have been in a low-oxygen wetland environment from deposition until recovery. But the

corroded green ones cannot as certainly be seen as indicating dry-land deposition. This is because a) shoreline displacement drained many wet sites after deposition, b) people in the study area began draining and ploughing wetlands on a large scale already in the 19th century, giving verdigris ample time to form on previously pristine bronzes in the ground before recovery.

3. Grouping and Characterising the Sites

Studying the landscape locations of the area's Bronze Age deposition sites, it soon becomes apparent that the most common class of landscape feature involved is water in all its forms: still and flowing, fresh and brackish. This emerges particularly clearly if we look at the Bronze Age state of things rather than the modern, uplifted and drained landscape. Beyond that, my studies have convinced me that the second-most important attractor in the landscape is simply settled spaces, as seen in the distribution of burnt mounds and rock art. Early in my work (Rundkvist 2011b; in press) I saw an affinity among the deposition sites for sublime and dramatic landscape locations. This tendency in a small sample of particularly rich find spots has not been borne out by study of the whole material. Some locations are indeed dramatic, but most are not, and the dramatic ones conform to the general placement pattern.

So seek the bronze axe in the watery parts of the settled Bronze Age landscape. But before delving into details, let us orientate ourselves at the opening of this chapter with a summary of its main results (tab. 3:1). Note three things already at this stage.

a. 59% of the find spots are in or on the shores of Bronze Age lakes or sea inlets. This may be a low estimate if some of the apparent bogs were in fact lakes at the time.
b. The 13% that are dry-land locations probably include several unrecognised burial and settlement sites, that is, deposition events that are not really relevant to the study's theme.
c. Thus the figure of 87% wet locations represents a minimum.

Tab. 3:1. Location types for Bronze Age deposition, by frequency.

Location	**No of sites**	**%**
In/at Bronze Age lake	47	33%
In/at Bronze Age sea inlet	37	26%
In/at Bronze Age river/stream	23	16%
Dry land	19	13%
In Bronze Age bog	11	8%
Multitrait, wet	5	4%
Sum total	*142*	*100%*
Sum wet	*123*	*87%*
Sum dry	*19*	*13%*

Multi-Episode Sites: Accumulated Deposits

Let us begin our close look at the landscape preferences of the people involved with sites that have yielded accumulated deposits. This term refers to a series of deposition events, not to hoards whose contents have accumulated over time and then been buried

at a single event. When a site has proved attractive enough that people have returned to it, then it is particularly important for us here to study its characteristics. I am aware of only six multi-episode sites (tab. 3:2). All were wet locations in settled areas, 1–4 kilometres from registered burnt mounds and rock art. These, as we shall see, are common traits among the deposition sites under study.

Four of the six locations share some further important traits. During the Bronze Age, each was in or next to a river at the point where it entered and/or exited major bodies of water. At least three sites were white-water gorges with rapids or waterfalls. This offers an explanation for how people could stage so many deposition events so accurately at these same sites over so long a time. Three of the six sites saw deposition already in the Middle or Late Neolithic. I have argued above that the constant here is not any oral tradition about previous deposition *events*, but a long-lived set of *rules* for where deposition is appropriate.

A stretch of river rapids is dramatic to the senses, easy to find, small in its dimensions and long-lived (prior to modern hydraulic engineering). This, I believe, is why the white-water sites are so over-represented among the accumulated deposits in comparison to e.g. the Bronze Age lakes. A stretch of rapids is always there and always attractive, even if the celebrants of each event through the centuries believe that they are the first to ever make a deposition there. Conversely, even though certain Bronze Age lakes may have been seen as appropriate for deposition for centuries, there was no similarly distinctive point on most lake-shores that could steer the depositions, allowing an identifiable accumulation of objects could form. When modern-day archaeology becomes aware of depositions in such a lake, it is usually a question of only one object, while we see the deposition made 150 years previously across the lake as a separate site, if indeed we are aware of it at all.

Table 3:2	**Bronze Age landscape situation**	**Date range**	**Distance from burnt mound (km)**	**Distance from rock art (km)**
Nä, Glanshammar, Storsicke	Multi-trait: wetland on peninsula next to the mouth of River Överstaån on Lake Hjälmaren – gorge?	Per. I, II, LBA	2.6	3.8
Sö, Bärbo, Täckhammarsbro	River: in whitewater gorge, beginning of rapids between Lake Långhalsen and the sea (River Nyköpingsån)	MNEO, LNEO, Per. I, II, IV, and later	2.6	1.3
Sö, Eskilstuna, Hyndevads dammar	River: in whitewater gorge where Lake Hjälmaren emptied into the sea (River Eskilstunaån)	LNEO, Per. I, II, IV-V, V, VI, and later	1.3	1.4
Sö, Vrena, Vrenaån	River: in whitewater gorge between Lakes Hallbosjön and Långhalsen	Per. I, IV-V	1.6	1.5
Up, Skogs-Tibble, Ingla/Vicarage	Lake: in/at inland lake	Per. IV, VI	c. 0.1	c. 1.0
Up, Vårfrukyrka, Grop-Norrby	River: in/at short stream between coastal lakes	LNEO, Per. III	c. 0.8	c. 0.1

Single-Episode River Sites

The characteristics of the multi-episode sites lead us on to river sites where we know of only one object or hoard, or finds of only one Bronze Age period that may have been deposited at a single event. I am aware of 19 such sites (tab. 3:3). All or none of them may in fact be as rich and long-lived as the multi-episode sites treated above: we know only what finders have told us. As to the landscape character of these sites, note that even the largest rivers in the area are little more than streams a few tens of meters across. This is reflected in the names of the water courses with deposition sites, all but one of which are *åar*. At one or two sites we are actually dealing with little streamlets, *bäckar*. Some finds made in modern rivers turn out to originate in ancient lakes or sea inlets when checked against the Geological Survey's landscape history model, and are dealt with in the following sections. And conversely, a few other basins probably held Bronze Age streams where there are now bogs.

Table 3:3	**River/stream, Bronze Age landscape situation**	**Date**	**Objects**	**Distance from burnt mound (km)**	**Distance from rock art (km)**
Nä, Edsberg, Löten	In Fjugestaån/Ruggebäcken, a small tributary of Svartån, inland	Per. V-VI	Axe	>5	3.3
Nä, Glanshammar, Hassle	In Äverstaån, short river stretch between small lakes, 3.8 km upstream from river mouth at Storsicke	Per. VI	Mixed hoard	2.9	0.2
Nä, Karlskoga	In Svartälven where the river emptied into Lake Möckeln	Per. V-VI	Axe	>5	>5
Nä, Kumla, Blacksta	Near Ralaån, close to its confluence with Kumlaån, inland	Per. III	Axe	>5	>5
Nä, Örebro, Skebäck	In Svartån where the river emptied into Lake Hjälmaren	Per. V-VI	2 axes	City	City
Sö, Barva, Bjurkärrsäng	In/at small stream	Per. III	3 axes	>5	c. 2.5
Sö, Helgona, Kristineholm	In Nyköpingsån: whitewater gorge, end of rapids between Lake Långhalsen and the sea, 1.4 km downstream from Täckhammarsbro	Per. IV-V	Axe	1.2	1.0
Sö, Lid, Lilla Lundby	In/at stream that drains Lake Lagerlundssjön	Per. II-III	Axe	c. 0.4	c. 0.4
Sö, Näshulta, Kråksten	In/at Sjöängsrändeln stream near where it emptied into Lake Näshultasjön	Per. IV-V	Stone axe	>5	>5
Sö, Torsåker, Harlinge	In short stream between lakes near its end	Per. I	Spear	3.9	2.6
Up, Altuna, Drävle	In short stream near where it emptied into coastal lake	Per. I	Axe	2.2	2.7
Up, Simtuna/Torstuna, Forsby bridge	In Örsundaån, short river stretch with rapids between a lake and another lake or inlet of the sea	LBA	Stone axe	0.5	1.2
Up, Skogs-Tibble, Lill-sjön/Stensmyran	In/at short stream between an inland lake and a lake or sea inlet, currently Stensmyran bog	Per. I	Axe	0.9	1.8

Up, Skogs-Tibble, Ulvansvad	In/at short stream between lake and sea, currently Sävaån	Per. I-II	Flint dagger	c. 0.3	c. 3.6
Up, Ärentuna, Gammelängen	Near Lissån, under **boulder** next to end of short stream between inland lakes	EBA	Spear	3.0	3.0
Up, Österunda, Täppdammen	In/at short tributary of Skattmansöån	?	Spear	c. 1.1	c. 1.5
Vs, Arboga, Kråkdiket/Vinbäcken	In Kråkdiket/Vinbäcken where it emptied into the sea	LBA	Stone axe	c. 1.9	>5
Vs, Tortuna, Fors	In rapids where a lake system emptied into the sea, currently Tillbergaån/Lillån	Per. I	2 axes	1.0	0.1
Vs, Västerås, Tunby	In/at short stream between lake and sea	Per. II	Axe, 3 sickles	0.1	0.4

The accumulated finds treated above demonstrate that rapids were important. And so we might begin our study of the river sites by noting that two are at hamlets named something with *fors*, denoting rapids: Forsby in Torstuna (Up) and Fors in Tortuna (Vs) (the two parish names, though similar, are not in fact cognate). And more generally, the rule seems to be that river deposition was seen as appropriate at sites where a river *changes states*. Only a few finds have been made where the river apparently just flowed past and did nothing in particular. Most sites are where rivers entered or exited bodies of still water, often with rapids. As Fredengren (2011:116) puts it, "... metalwork depositions were placed at exits of waters such as river mouths and the confluence (meetings) of different waters, sweet and salt". Note though that the meeting of fresh water and the brackish Baltic does not in fact seem to have been very important when seen in the light of my larger sample. All sites except three are in the settled landscape near registered burnt mounds or rock art.

Lake Sites

Many of the river sites are near the lakes these watercourses drain or replenish. And deposits were made in the lakes as well – in fact, overwhelmingly commonly. Identifying Bronze Age lakes is largely contingent on the Geological Survey's model, as the situation is in many cases very different today. Many of the era's lake basins have

- silted up into bogs
- dried out through land uplift, becoming river vales
- recently been artificially drained and cultivated

And conversely, many current lakes were inlets of the sea during the Bronze Age. But any current body of open water was open water during the Bronze Age too, though often at a higher level in relation to its basin. As it turns out, Bronze Age lakeshores and lakes form the most common category of deposition site of all: I am aware of 47 including one of the multi-episode sites discussed above.

Table 3:4	Lake, Bronze Age landscape situation	Date	Objects	Distance from burnt mound (km)	Distance from rock art (km)
Nä province	In Lake Hjälmaren, south-west part	Per. I	Axe	?	?
Nä, Asker, Bystad	In/at Lake Sottern, on island or peninsula, near mouth of stream on north-facing shore	Per. IV-V	Axe	>5	>5
Nä, Ekeby, Mosjön	In Lake Mosjön, south-east part	Per. I-II	Flint dagger	>5	>5
Nä, Glanshammar, Sticksjö	In Lake Hjälmaren among small islands	Per. I-II	Flint dagger	>5	c. 4.4
Nä, Lännäs, Tunäs/vicarage	In Lake Hjälmaren next to the mouth of river Täljeån on east-facing shore	Per. II	Spear	>5	>5
Nä, Lännäs, Djursnäs	In/at Lake Hjälmaren next to a stream mouth on north-facing shore	Per. V-VI	Spear, knife	>5	>5
Sö, Björkvik, Edeby	In/at Lake Yngaren on south-facing shore of island	Per. I	Axe	0.6	0.7
Sö, Frustuna, Hållsta	In coastal lake or sea inlet, currently the drained Lake Igelsjön	Per. I	Axe	1.4	0.3
Sö, Frustuna, Hällesta	In/at lake, currently drained farmland	Per. II	Axe	1.9	1.7
Sö, Helgesta, Frändesta, Oxbroberget	On high promontory on south-facing shore of island above narrows in Lake Båven	Per. III	Spear	c. 0.5	>5
Sö, Huddinge, Solgård	In/at west end of long narrow lake, under **boulder**	Per. V	Dagger	>5	1.1
Sö, Husby-Oppunda, Tärnö	In Lake Långhalsen among small islands	Per. II	Axe	3.7	3.2
Sö, Husby-Rekarne, Årby	In small inland lake	Per. IV-V	Axe	c. 0.6	c. 1.0
Sö, Kila, Villa Solbacken	In Lake Bålsjön	Per. II	Axe	>5	>5
Sö, Lista, Vingsleör	In Lake Apalsjön	Per. I-II	Flint dagger	c. 1.5	c. 3.7
Sö, Torsåker, Torsnäset	In/at Lake Sillen, below high promontory	Per. III-IV	Axe	c. 0.5	c. 1.7
Sö, Torsåker, Tuna	In Lake Sillen	?LBA	Axe	0.8	1.1
Sö, Turinge, Ekudden	In/at Lake Norra Yngern, on south-west-facing shore of promontory	Per. III	Mixed hoard	0.2	>5
Sö, Tveta, Rophäll	In Lake Långsjön	Per. IV-V	Axe	2.9	1.5
Sö,	In Lake Långsjön	Per. III	Axe	c. 0.2	c. 1.4

Vårdinge, Nådhammar					
Sö, Västerhaninge, Prästängen	In/at inland lake, on west-facing shore	Per. IV-V	Axe	>5	c. 3.4
Sö, Österåker, Maren	In/at Lake Hjälmaren near the mouth of River Forsån, “Rapids Stream”, on west-facing shore	Per. IV-V	Stone axe	>5	>5
Up, Björklinge, Kambo	In/at Lake Långsjön, on west-facing shore	Per. V	Axe	c. 2.3	c. 2.8
Up, Fasterna, Grindtorpet	In Lake Skedviken near mouth of stream on north-east-facing shore	Per. V-VI	Axe	c. 1.1	c. 4.4
Up, Funbo, Marielund	On high promontory on south-east-facing shore of Lake Trehörningen	Per. V	Belt dome	0.8	5.0
Up, Järfälla, Säby	In Lake Säbysjön, located on an island in the sea	Per. IV	Neck ring, 2 gold spirals	1.0	0.8
Up, Knutby psh	In Lake Långsjön, located on an island in the sea	Per. VI	Weapon hoard	c. 1.9	c. 4.4
Up, Kårsta, Lilla Sunnarby	In lake on island in dense archipelago, currently Mysingsån stream	Per. IV	Neck ring	1.8	2.3
Up, Lunda, Sigridsholm	In coastal lake or sea inlet, currently Lake Sigridsholmssjön	Per. VI	Mixed hoard	3.9	4.8
Up, Läby, Håmö, Frosshögarna	In Lake Läbyträsk	LBA	Stone axe	c. 0.7	c. 0.8
Up, Nysätra psh	In/at Lake Hålsjön	Per. V-VI	Axe	c. 3.2	c. 4.1
Up, Rasbo, Västerberga	In coastal lake	Per. IV-V	Axe	c. 1.1	c. 0.7
Up, Rasbokil, Årby	In/at lake, currently Årbymyran bog	Per. IV-V	Axe	c. 2.1	c. 2.2
Up, Ramsta, Bragby	In small lake on island in sea	Per. I	Sword	c. 0.6	c. 1.5
Up, Skogs-Tibble, between Vrå and church	In coastal lake or sea inlet, currently River Sävaån	Per. I	Axe	0.9	0.5
Up, Skogs-Tibble, Ingla-Långmyran	In inland lake, currently Långmyran drained bog	Per. IV-V	Axe	c. 1.2	c. 2.0
Up, Skogs-Tibble, Långmyran	In inland lake, currently Långmyran drained bog	Per. II-III	Axe	c. 2.2	c. 2.6
Up, Vendel, Holvarbogärde	In/at small inland lake	Per. V	Axe	>5	c. 1.7

Up, Vittinge, Ösby	In/at small inland lake	Per. III-IV	Axe	>5	c. 4.1
Up, Vänge, Bärby	In Lake Rönningen, at narrows	Per. V-VI	Axe	1.7	3.2
Up, Vänge, Bärby	In lake, currently River Sävaån	LBA	Stone axe	0.6	c. 1.3
Up, Österunda, Domta vad	In lake, currently bog	Per. V	Belt domes, rings	>5	2,1
Up, Österunda, Oxsjön	In/at Lake Oxsjön	Per. II-III	Sword chape	2.3	3.5
Up, Österunda, Pukberget	At narrows in inland lake, in **cave**	Per. V-VI	Spear	>5	2.5
Vs, Björksta, Vida/Högtorp	In/at inland lake on south-west-facing shore	Per. III	Axe	c. 0.2	c. 0.3
Vs, Fellingsbro, Eke	In Lake Sällingsjön	Per. III	Dagger	>5	>5

Lakes named Långsjön, “the long lake”, have yielded many finds. It would be difficult to calculate the percentage of the area's Bronze Age lakes that currently bear this common name. But they do appear over-represented among the deposition sites, which would suggest that Bronze Age people were attracted to relatively long and narrow waters when depositing objects – as we have already seen from the many river finds. Note also the two finds from the Långmyran former bog (“the long bog”) in Skogs-Tibble (Up), and the many locations at long narrow sea inlets as documented below. Narrows in lakes are clearly attractive too. Perhaps we are seeing something similar to how people behaved around rivers and streams: lake deposition was deemed particularly appropriate at spots where the lake *did something*. In a few other cases, lakes have been selected that were on islands in the sea at the time of deposition, demanding that people travel across brackish water with the objects in order to reach the freshwater lake for the deposition event. People do not seem to have favoured any particular facing for deposition on or just off the lake shores.

As argued above, the reason that so few lake sites have yielded accumulated finds attesting to multiple deposition episodes is probably as follows. Even if a group of people agree for many generations that a certain lake is appropriate for depositions, then they will only rarely happen to select the same spot along the lakeshore for such events more than once. This is because they have no written record of where the last deposition event was enacted, and the lake itself offers no hint.

Inlets of the Baltic Sea

Some finds from current lakes are difficult to date in relation to each lake basin's isolation from the Baltic Sea. They may have been deposited in brackish sea water with all its communicative potential, before the isolation phase, or in fresh water after it. There are however many sites without this ambiguity, where objects have clearly been deposited in or at inlets of the sea. I know of 38.

An association with islands is far more common here than among the lake locations. This is because of the Mälaren basin's topography: a great deal of its surface area was (and is) taken up by islands rather than by water. In order to deposit an object in the open sea far from any island, a person would have to travel quite far from settled parts,

which we have seen that they usually did not do for that purpose. Also, an object deposited in the deep sea would be highly unlikely to come to our attention. In any case, it appears that for most kinds of object, the distinction between the freshwater of lakes and rivers and the brackish water of the Baltic was not decisive for whether a given location was acceptable as a deposition site. As we have seen though, in a few cases a freshwater lake located on an island in the sea was chosen.

With the sea inlet sites, there is a clear 5:2 preference for deposition near south-facing shores over north-facing ones.

Table 3:5	**Sea, Bronze Age landscape situation**	**Date**	**Objects**	**Distance from burnt mound (km)**	**Distance from rock art (km)**
Sö, Brännkyrka, Årsta	On/at north-facing shore near narrow mouth of inlet	Per. II	Axe	City	c. 1.7
Sö, Eskilstuna, Tunavallen	On/at north-facing shore next to the mouth of River Eskilstunaån	Per. IV-V	Axe	2.0	2.5
Sö, Grödinge, Sibble	On south-facing shore of an island	Per. III	4 sickles	c. 0.1	c. 0.9
Sö, Sorunda, Fituna, Mörkarfjärden	In an inlet, between the Södertörn mainland and a small island	Per. IV-V	Stone axe	>5	c. 1.8
Sö, Spelvik, church hill	On/at south-facing shore of sheltered inlet, under a **boulder**	Per. VI	Mixed hoard	0.6	0.5
Sö, Strängnäs, Sundby	At inlet on south-facing shore of an island, under a **boulder**	Per. VI	Jewellery hoard	>5	c. 2.4
Sö, Tunaberg, Bråten	At south-facing shore, inner end of protected inlet	Per. II	Axe	c. 4.5	c. 0.8
Up, Alsike, Krusenberg	South-facing shore of major island in dense archipelago	Per. V-VI	Axe	>5	c. 3.7
Up, Bromma, Norra Ängby	In a narrow inlet between two islands	Per. II	Axe	4.1	0.7
Up, Börje, Brunnby	In an inlet among small islands	Per. I	Axe	c. 0.4	c. 0.9
Up, Ekerö, Skärvik	South-facing shore of island	Per. V-VI	Stone axe	c. 3.4	c. 1.3
Up, Fröslunda, Noppsgärde	Off south-west-facing shore of an island	Per. I	Spear	1.6	0.1
Up, Gryta, Säva	South-facing shore of small island in dense archipelago	Per. I	Axe	c. 0.3	c. 1.1
Up, Gryta, Grängesberg/Eningsberg	At north-facing shore, inner end of protected inlet	Per. I	Axe	c. 0.2	c. 0.2
Up, Dalby, Gräna	In wide inlet, currently Lake Ekoln	Per. I	Axe	c. 2.0	c. 0.1
Up, Dalby, Tuna	South-facing shore of inlet	Per. V	Axe	c. 0.3	c. 0.3
Up, Edsbro, Smaranäs	In long canal-like inlet acting as inland travel lane, currently Lake Sottern	Per. IV-V	Axe	3.4	>5
Up, Gamla Uppsala, Sanda	On east-facing slope of **short gravel ridge** island	Per. V	Axe	c. 1.3	c. 2.0
Up, Hagby, Focksta	On/at east-facing shore of	Per. II	Spear	c. 0.1	c. 0.3

	sheltered inlet, currently Sävaån				
Up, Hammarby, Ekebo	East-facing shore of inlet on small island in dense archipelago, under a **boulder**	Per. V	Axe	3.7	3.7
Up, Husby-Sjutolft, Ekolsundsviken	Between two large islands in dense archipelago, currently an inlet	Per. IV-V	Axe	3.4	2.9
Up, Jumkil, Ubby	In inlet, currently a tributary of River Jumkilsån	Per. I	Axe	c. 0.4	c. 2.5
Up, Lagga, Morby	Cove on north-facing shore of large island	LBA	Stone axe	c. 3.1	c. 3.6
Up, Lena, Edshammar	West-facing shore of long narrow inlet of the sea, currently Fyrisån	Per. VI	Spear, axe	c. 0.6	c. 0.7
Up, Skepptuna, Ånsta	In narrow closing inlet between two recently joined islands in dense archipelago	Per. VI	Sword	c. 3.2	c. 1.4
Up, Solna, Råsunda	South-facing shore of island	Per. VI	Sword, dagger	4.3	2.0
Up, Solna, Ulriksdal	On/at north-east-facing shore of Edsviken inlet	Per. I	Axe	>5	c. 2.3
Up, Spånga, Oljeberget	South-facing shore of small island or peninsula	Per. V-VI	Axe	3.3	0.8
Up, Stockholm, Hammarby/Mårtensdal	In long canal-like inlet acting as travel lane through dense archipelago	Per. V-VI	Stone axe	City	2.2
Up, Stockholm, Karlbergsvägen	South-facing shore of small island	Per. I	Axe	City	c. 2.1
Up, Stockholm, Värtahamnen	Between two small islands	Per. II	Axe	City	c. 1.8
Up, Söderby-Karl, Norrmarjum	Among islands	Per. I	Axe	c. 1.1	>5
Up, Uppsala, Tingshögsgatan	Near small islands	LBA	Stone axe	c. 1.8	c. 2.0
Up, Uppsala-Näs, Skärfältens	In long canal-like inlet acting as inland travel lane, currently Sjökärret Bog	Per. I	Spear	c. 0.5	c. 0.6
Vs, Fellingsbro churchyard	South-facing shore of small island or peninsula	Per. I	Axe	c. 2.4	c. 3.3
Vs, Kärrbo, Skyttebo	South-facing shore of promontory on island at protected inlet	Per. II	Axe	c. 4.4	c. 2.9
Vs, Odensvi, Kumla	East-facing shore of promontory	Per. I	Axe	0.9	0.6
Vs, Skultuna, Åkesta	On/at south-west-facing shore of long canal-like inlet acting as inland travel lane, currently Svartån, just downstream from rapids at Forsby	Per. IV-V	Stone axe	c. 0.4	c. 0.5

Bronze Age Bogs/Other Wetland

This site location category involves modern-day bogs that are not sea inlets or lakes on the Geological Survey's landscape reconstructions for the Bronze Age. If we look far enough back into time up until deglaciation, all bogs in the study area are actually silted-up former lakes and/or inlets of the sea. But the apparent Bronze Age bogs are difficult to interpret because sediment drill cores for environmental history have only been analysed for very few. For each of these basins it is in fact uncertain if there was any open water in it at the time of an individual Bronze Age deposition event. The question boils down to whether finds from apparent Bronze Age bogs represent people throwing objects into water (irretrievably), burying them in pits in the peat (retrievably) or leaving them on top of the peat (even more retrievably). Luckily these sites are rather few.

Table 3:6 does not cover finds where only the name of the hamlet owning the land and the mention of a bog are known. There we cannot judge if a given find belongs in this category or is in fact from a Bronze Age sea inlet, lake or stream.

Table 3:6	**Bog, Bronze Age landscape situation**	**Date**	**Objects**	**Distance from burnt mound (km)**	**Distance from rock art (km)**
Nä, Edsberg, Karaby	Nondescript bog, near a **boulder**	Per. I-II	Flint dagger	>5	3.6
Sö, Björnlunda, Mosstugan	Nondescript bog	Per. I	Sword	1.5	1.1
Sö, Eskilstuna, Kälby	0.9 km from the Hyndevad rapids in River Eskilstunaån	Per. II	2 display axes, dagger	0.5	1.5
Sö, Svärta, Kråknäs/Kråkstugan	Nondescript bog	Per. IV-V	Axe	c. 1.9	c. 0.2
Sö, Svärta, Kråknäs/Kråkstugan	Nondescript bog	Per. VI	Sword, neck ring	1.8	0.1
Sö, Vårdinge, Hjortsberga	Bog next to settlement with graves and cupmarks	Per. VI	Neck ring	c. 0.2	c. 0.3
Sö, Östra Vingåker, Skiringstorp	Nondescript inland bog	Per. II	Sword	>5	>5
Up, Nysätra, Stockmossen	Nondescript inland bog	Per. V	Axe	c. 4.1	c. 4.1
Up, Sparrsätra, Gångmossen	Inland bog next to small lake in separate basin	Per. V-VI	Pin	c. 0.8	c. 2.5
Up, Spånga, Backlura	Inland bog on large island	Per. II-III	Sword	2.6	3.1
Vs, Svedvi, Berga I-II	In/at lake below the Svedvi vicarage ridge site	Per. V-VI	2 jewellery hoards	c. 0.5	c. 0.5

Multitrait Locations

Having identified some categories of landscape location that attracted Bronze Age deposition in and of themselves, we may now look at sites that combine two or more of these categories (tab. 3:7). They deviate distinctly from the norm in several respects.

Unusually, all four sites are on gravel ridges. The two sites in Lena parish are

only c. 800 m apart and may be close in time as well. Torslunda in Tierp is a lone northern outlier in the macro-scale distribution of the sites across the study area. These multi-trait sites are not only exceptional in terms of their Bronze Age topography, but also of what people chose to deposit there: weapons and multi-object hoards.

Table 3:7	**Bronze Age landscape situation**	**Date**	**Objects**	**Distance from burnt mound (km)**	**Distance from rock art (km)**
Sö, Vårdinge, Långbro	Next to **small cairn** in small **bog** on top of **short gravel ridge** above **lake shore**	Per. VI	Mixed hoard	c. 0.9	c. 1.6
Up, Lena church	On **south gravel ridge terminal** above **whitewater gorge** where Vattholmaån entered a long narrow inlet of the sea, currently Vendelån-Fyrisån	Per. II-III	Sword	0.5	0.3
Up, Lena, Vattholma	On **south gravel ridge terminal** above **whitewater gorge** where Vattholmaån entered a long narrow inlet of the sea, currently Vendelån-Fyrisån	Per. IV	Weapon hoard	0.8	0.8
Up, Tierp, Torslunda	On **south gravel ridge terminal** at south-east-facing **shore of long sea inlet**	Per. I	2 axes, spear	c. 2.4	c. 1.9

Dry Land: Gravel Ridges and Settlements

As seen above, a few finds can be pinpointed to eskers, the gravel ridges that cross the study area in a NNW–SSE direction. (They map the slow movement across the land of the mouths of meltwater rivers under the inland ice during deglaciation.) All such sites are either on the southern terminal of a longer stretch of ridge or on a short ridge where no real terminal can usefully be distinguished. Another handful of finds with location information only on the hamlet level are reported to have come to light during gravel extraction, suggesting that gravel ridges may have been attractive in themselves as deposition locations. But not all gravel pits are on ridges. And in the cases where we can pinpoint a find accurately on an esker, the tendency is for the site to have other characteristics that have proved attractive in far more numerous cases – see the multitrait sites above. There is in fact only one accurately pinpointed esker site that has none of the usual watery associations documented above: Hökåsen in Hubbo (Vs). A burnt mound and a cupmark boulder suggest nearby settlement.

This is not a study of depositions made among the buildings of active settlements, such as the sword pommel from Sommaränge skog in Viksta (Up) mentioned in Ch. 1 (Forsman & Victor 2007) or the spearhead found near burnt mounds at Orreboda in Uppsala-Näs (Up; Raä 116-118; UMF 4826). But one of the very largest hoards from the study area, from Lilla Härnevi in Härnevi (Up), was found on the outskirts of a likewise very large settlement site. Most likely however this Late Per. VI deposition was made centuries after the settlement had been abandoned. Radiocarbon places the only excavated burnt mound there about 900 cal BC, in Per. V (Karlenby 1998:27–28), and by the time of the hoard's deposition the site had long lost contact with the receding seashore that was generally decisive in settlement siting. Speculating about the rationale behind this unique find's placement, I believe the people behind it recognised the site with its many prominent burnt mounds as an ancestral dwelling place.

In the study area, we do not see anything like the Lilla Härnevi deposit even at major

well-excavated settlements such as Hallunda in Botkyrka, Apalle in Övergran or Pryssgården in Östra Eneby (Jaanusson 1981; Ullén 1997; Borna-Ahlkvist 2002). But in south-east England, Bronze Age hoards are sometimes found on the edges of settlement-indicating flint scatters (Dunkin 2001).

Table 3:8	**Bronze Age dry land landscape situation**	**Date**	**Objects**	**Distance from burnt mound (km)**	**Distance from rock art (km)**
Up, Härnevi, Lilla Härnevi	Edge of abandoned settlement site, inland	Per. VI	Mixed hoard	0	0.4
Vs, Hubbo, Hökåsen	South gravel ridge terminal	Per. VI	2 jewellery hoards	0.8	1.4
Vs, Svedvi vicarage	South gravel ridge terminal above the Berga I-II lakeshore site	Per. VI	Neck ring	0.6	0.5

Dry Land: Nondescript Locations

This category lists finds from dry locations where I know to good accuracy where a find has been made but cannot see anything distinctive about the place. Common characteristics among these 14 sites are that most have yielded *Late* Bronze Age finds and are located only a few hundred meters from burnt mounds and rock art. This suggests that we are dealing mainly with finds from unrecognised settlements. A few of the objects may nevertheless have been deposited ritually according to landscape rules that I have not picked up on, or been placed in unrecognised graves, or simply been lost to happenstance.

Table 3:9	**Bronze Age landscape situation**	**Date**	**Objects**	**Distance from burnt mound (km)**	**Distance from rock art (km)**
Sö, Sorunda, Petterslund	On low ridge, 0.4 km east of Fagersjön lakeshore, major Late Mesolithic settlement site	Per. V-VI	Dress pin	4.5	4.5
Sö, Sorunda, Södra Rangsta	W foot of ridge, 0.6 km north of seashore	Per. V-VI	Spear	0.2	0.2
Sö, Överjärna, Järna rwst	Between two ridges, 0.7 km from seashore and lakeshore	Per. I-II	Flint dagger	c. 0.8	c. 0.7
Up, Bondkyrka, Grindstugan	E of low ridge on large island in dense archipelago	Per. III-IV	Axe	c. 1.0	c. 2.7
Up, Börje, Altuna	Upland, 0.7 km west of seashore	Per. VI	Mixed hoard	c. 0.2	c. 0.6
Up, Dalby, Tuna	Flat ground 0.3 km from south-facing shore of sea inlet	Per. V	Axe	c. 0.3	c. 0.3
Up, Lena, Flugtorpet	E foot of low inland hill, 1.1 km from lakeshore	Per. V	Axe	c. 1.8	c. 1.3
Up, Skogs-Tibble, Lundbacka	Upland, 0.6 km from lakeshore	Per. VI	2 neck rings	c. 0.4	c. 0.3
Up, Spånga, Sundby	Flat ground on island between Flystaberget Hill and seashore, c.	Per. VI/IA	2 armlets	3.3	0.4

	0.1 km from shoreline				
Up, Vårfrukyrka, Hällstigen	Upland, 0.5 km from lakeshore	Per. V-VI	Stone axe	c. 0.2	c. 0.3
Up, Ärentuna, Storvreta rwst	Upland, 1.0 km from seashore	Per. II	Mixed hoard	0.5	0.5
Vs, Hubbo, Mälby	Upland, 0.2 km from lakeshore	Per. V	Axe	3.1	0.2
Vs, Malma, Åsby	South-facing hillside, 0.6 km from lakeshore	Per. VI	Neck ring	0.2	0.2
Vs, Västra Skedvi, Klockarkilen	Between low hills, 2.5 km from lakeshore	Per. IV-V	Stone axe	>5	>5

Strong Place Features: Boulders, a Cave, a Spring, Rock Crevices

So far each site has only been mentioned in one table. But in table 3:10 some sites are mentioned a second time because they had *strong place features*. On this study's landscape scale level and considering the somewhat forgiving accuracy I have demanded for positioning, these are features that should in my opinion be seen more on the level of site detail than as landscape *locations* in the usual sense. Most are simply boulders, but here I also count the Pukberget cave in Österunda (Up) that I have classified as a lakeshore location and the Norrbacken spring in Husby-Långhundra (Up) that is to my eye an otherwise nondescript location. Both the cave and the spring are unique place features among the studied sites, and so they are difficult to interpret. But both in my opinion carry a strong timeless suggestion of the numinous.

Only ten of these sites have sufficient location information to classify their landscape location. The most eye-catching difference from the general distribution (tab. 3:1) is that dry sites are twice as common here with the strong place features. This probably largely reflects the simple fact that it is difficult to hide anything under an underwater boulder. But it may also have to do with retrievability: if people wanted to be able to retrieve a deposition, burying it under a boulder on dry land was the most dependable alternative. It should thus not surprise us to find hoards greatly over-represented in the boulder category.

Mention should also be made of a rare but recurring association between spears and rock crevices. At Oxbroberget in Helgesta (Sö), a site I have classified above as a lake location, a spearhead had been left in a fissure on a hillside. Similarly, the spearhead found next to a stream at Gammelängen in Ärentuna (Up) was described by the finder as having been thrust below a boulder. And the spearhead from the Pukberget cave in Österunda (Up) had obviously entered a hill entirely. Looking for a moment at a nearby region, a bronze spearhead was found “wedged into the rock face” at Hassli on the limestone island of Stora Karlsö, Eksta parish, Gotland (SHM 8343). These finds, though separated by centuries, suggest a custom where spears were seen to belong inside bedrock. They invite speculation about the goings-on between Father Sky and Mother Earth, or about sacrifices to some deity of high places. Looking at jewellery, a crevice at Väster-vad in Simtuna (Up) has yielded a Per. VI brooch and dress pin (SHM 4288). Similar finds in crevices and caves have been made in Lower Saxony (Kubach 1983:140-142 w. refs) and southern Germany (Maier 1977; Schauer 1996:382 note 3 w. refs).

Table 3:10	Strong Place Feature	Site type	Date	Objects	Distance from burnt mound (km)	Distance from rock art (km)
Up, Husby-Långhundra, Norrbacken	In inland **spring**	Nondescript	Per. IV	Axe	c. 1.3	c. 0.8
Up, Österunda, Pukberget	At narrows in inland lake, in **cave**	Lake	Per. V-VI	Spear	>5	2.5
Nä, Edsberg, Karaby	Boulder	Bog	Per. I-II	Flint dagger	>5	3.6
Nä, Ekeby, Frommesta	Boulder	?	Per. I	Bronze axe, stone axe	?	?
Nä, Ekeby, Högtorp	Boulder	?	Per. II-III	Axe	?	?
Nä, Ekeby, Torsta	Boulder	?	Per. I	Axe	?	?
Nä, Stora Mellösa, Dömmesta	Boulder	?	Per. III	Axe	?	?
Sö, Botkyrka, Tullinge	Boulder	?	Per. III	Mixed hoard	?	?
Sö, Gillberga, Åsby	Boulder	?	Per. I	Axe	?	?
Sö, Huddinge, Solgård	Boulder	Lake	Per. V	Dagger	>5	1.1
Sö, Kila, Ålberga	Boulder	?	Per. II	Axe	?	?
Sö, Spelvik, church hill	Boulder	Sea	Per. VI	Mixed hoard	0.6	0.5
Sö, Strängnäs, Sundby	Boulder	Sea	Per. VI	Jewellery hoard	>5	c. 2.4
Up, Hagby, Filke	Boulder	?	EBA	Spiral arm ring	?	?
Up, Hammarby, Ekebo	Boulder	Sea	Per. V	Axe	3.7	3.7
Up, Simtuna, Möllersta	Boulder	?	Per. I-II	Axe	?	?
Up, Ärentuna, Gammelängen	Boulder	Stream	EBA	Spear	3.0	3.0
Up, Ärentuna, Storvreta rwst	Boulder	Dry nondescript	Per. II	Mixed hoard	0.5	0.5
Vs, Hubbo, Hökåsen	Boulder	Gravel ridge	Per. VI	2 jewellery hoards	0.8	1.4

What Was Deposited Where And When?

Above we have largely looked at deposition as a single kind of act that took place at different kinds of location. But there is reason to believe that the blanket category of deposition covers a range of acts that were construed quite differently. Let us therefore investigate what was deposited where and when at these different kinds of location, in the manner of David Fontijn (2002:212 ff; 2008).

Table 3:11

A: EBA	**Lake**	**Sea**	**Stream**	**Bog**	**Dry nondesc**			**B: EBA**	**Lake**	**Sea**	**Stream**	**Bog**	**Dry nondesc**
Bronze axe	11	15	10	1	-	37		Bronze axe	30%	41%	27%	3%	0%
Spear	2	3	3		1	9		Spear	22%	33%	33%	0%	11%
Sword/dagger	3	-	1	4	-	8		Sword/dagger	38%	**0%**	13%	**50%**	0%
Jewellery	-	-	-	-	-	0		Jewellery	-	-	-	-	-
Mixed hoard	1	-	-	-	-	1		Mixed hoard	100 %	0%	0%	0%	0%
Flint dagger	3	-	1	1	1	6		Flint dagger	50%	0%	17%	17%	17%
Stone axe	-	-	-	-	-	0		Stone axe	-	-	-	-	-
Sum	20	18	15	6	2	61							
C: LBA	**Lake**	**Sea**	**Stream**	**Bog**	**Dry nondesc**			**D: LBA**	**Lake**	**Sea**	**Stream**	**Bog**	**Dry nondesc**
Bronze axe	13	8	7	2	3	33		Bronze axe	39%	24%	21%	6%	**9%**
Spear	2	-	-	-	1	3		Spear	67%	0%	0%	0%	33%
Sword/dagger	1	2	2	-	-	5		Sword/dagger	20%	40%	40%	0%	0%
Jewellery	4	1	1	3	4	13		Jewellery	31%	**8%**	8%	23%	31%
Mixed hoard	2	2	-	-	1	5		Mixed hoard	40%	40%	0%	0%	20%
Flint dagger	-	-	-	-	-	0		Flint dagger	-	-	-	-	-
Stone axe	3	6	3	-	2	14		Stone axe	**21%**	43%	21%	0%	**14%**
Sum	25	19	13	5	11	73							

Tables 3:11 ABCD only cover categories of object and location that have more than a few examples each, and disregard the few ambiguous multi-trait locations I have identified (such as Torslunda in Tierp). I count deposition events, that is sites and object categories, as on/off for the EBA and LBA respectively, not the number of objects or of deposition events within the EBA or LBA. For example, the number 11 regarding EBA bronze axes in lakes means that I know of 11 sites in or at EBA lakes where "bronze axe" is "on" at least once.

"Mixed hoards" are those that combine the categories in the tables, e.g. the weaponry, tools and jewellery in the hoard from Ekudden in Nykvarn. On the other hand, the successive accumulation of various objects at Hyndevad counts as four sites in the tables, one EBA (axe) and three LBA (axe, dagger, jewellery).

The percentages are more interesting than the absolute figures. For the EBA (tab. 3:11 B), one class of find behaves differently from the rest: swords and daggers. They are never found in Bronze Age sea inlets where axes and spears are common. Instead they concentrate in Bronze Age bogs, which have yielded no spears and hardly any axes. This looks intentional. (And it suggests, importantly, that we can actually largely rely on the Geological Survey's ability to tell Bronze Age lakes and bogs apart on their maps.) But what does it mean? That people wanted their swords to be more retrievable than their axes after deposition? Or that the sea god did not appreciate being given

swords? Anyhow, other patterns in the percentages for the EBA are too poorly grounded in the numbers to bear much interpretation.

For the LBA, the most interesting and most firmly data-supported percentages (table 3:11 D) pertain to the bronze and stone axes and the jewellery. Both kinds of axes are disproportionately rare on nondescript dry sites (probably unrecognised settlements): people very determinedly saved them for deposition at wet locations. The stone axes, though, are also exceptionally rare in lakes, but exceptionally common in sea inlets. The jewellery, conversely, is exceptionally rare in sea inlets and exceptionally common on nondescript dry sites. An obvious way to interpret this dichotomy is in terms of gender and mobility: men depositing axes in the sea on voyages abroad, women depositing jewellery at home. The interpretation suffers from the fact that we do not know which gender of people, if any, actually travelled more than the other. Also it is difficult to understand why, at sea, stone (battle) axes were treated so differently from bronze axes, some types of which were probably likewise designed more as weapons than as tools.

Deposition Sites in the Settled Landscape

Table 3:12

Median distances (km)	**Burnt mound**	**Rock art**
Lake EBA (n=19)	1.5	3.2
Lake LBA (n=24)	2.2	2.4
Sea EBA (n=19)	1.0	0.9
Sea LBA (n=19)	3.3	2.0
Stream EBA (n=10)	1.6	2.6
Stream LBA (n=7)	2.9	3.3
Nondescript dry LBA (n=11)	0.4	0.3
Multi-episode (n=6)	1.5	1.4
Boulder EBA + LBA (n=8)	3.4	1.9
Bog EBA + LBA (n=11)	1.8	1.5
All sites (n=140)	1.8	1.7

Table 3:12 presents the median distance from deposition sites of various categories to burnt mounds and rock art. To put these figures into perspective, note firstly that all categories of deposition site are typically only 1.7 or 1.8 km from those two other types of site. Most deposition sites were not liminal secret locations in the woods halfway to the neighbouring tribe's area: they were in the settled home territory. (I have not looked at the relationship to burial sites, for the reasons that the eye-catching Early Bronze Age cairns are simply and uniformly on coastal hilltops, while the known Late Bronze Age cremation cemeteries keep a low profile and are too few to support any significant conclusions.)

Secondly, Bronze Age people in all likelihood did not think of the distance between their settlements and rock art sites and the area's deposition sites in lakes and

sea inlets primarily in terms of the depositions, but in terms of how far they had to walk to the lakes and the sea themselves.

Thirdly, we do not have dates for most of the burnt mounds and rock art towards which I have measured the distances. (Most of the rock art being cupmarks which are not stylistically datable.) There must be many cases where a spot did not receive any burnt mounds or rock art until the LBA, and so was completely nondescript (or still below sea level) during the EBA. We must not over-interpret the figures. But it may be useful to compare them to one another. An interesting pattern emerges.

The great majority of deposition events – those in lakes, sea inlets and streams – move away from burnt mounds over the course of the Bronze Age, most dramatically in the case of the sea sites. Conversely, the deposition events in lakes and streams approach rock art sites over time – probably because most of the rock art is made at the same time as the LBA depositions, and by the same people. Only the deposition events in sea inlets move away from rock art as well as from burnt mounds, for some reason. Meanwhile, LBA nondescript dry sites are usually exceptionally close to both burnt mounds and rock art. I have already suggested that many of them are probably simply unrecognised settlement sites and thus not quite relevant to this study's theme.

We know that when LBA people went off from their settlements to deposit objects, they rarely travelled far. But table 3:12 shows that they were thinking differently than their EBA forebears had done and moving farther afield. Most burnt mounds in the study area probably mark LBA settlements, and these certainly do not avoid lakes or seashores. I believe this evidence carries some weight. Did deposition events become more private affairs with the LBA, at the same time as jewellery became more common in the deposits? This would explain why LBA people were willing to walk or paddle a longer distance from settlement to deposit objects than had their EBA forebears.

4. A Heuristic Procedure: Finding Unknown Deposition Sites

As David Yates and Richard Bradley put it, "Analysis of the findspots can shed light on the character of metalwork deposits themselves, but it is equally important to predict where further discoveries will occur" (2010a:4). For reasons of funding constraints and the dramatic damage to wetlands entailed in any comprehensive fieldwork, most deposition sites in the study area are probably not accessible to research-driven investigation without land-developer funding. Cases like the Per. I bronze spearhead from Harlinge in Torsåker (Sö), which was found under two metres of bog peat on an ancient stream bed, are all too instructive. Our best chances lie with taking metal detectors to promising sites that have been thoroughly drained and ploughed, causing the organic sediments to rot away and collapse. But contract archaeology has good opportunities for this kind of work. Road and railroad projects have ample budgets for archaeology and routinely cross various kinds of wetland. This also goes to some extent for peat quarrying operations – indeed, many important Mesolithic lake sites in southern Sweden have become accessible to archaeology only after several metres of later peat were quarried away for commercial purposes.

This chapter forms a kind of summary of the study's results. It is written as an heuristic procedure intended for archaeologists involved in large-scale land development in the study area that touches to some extent upon former or current wetlands. It should be useful throughout the current process in contract archaeology, from evaluation over trial excavations to final open-area excavations.

Step 1. Is this a productive parish?

A good first shorthand is to simply look at whether any Bronze Age depositions are previously known from the parishes you are working with or one of their neighbours. Settlement (and deposition) concentrates in a wide belt between the sea and the elevated inland, and beyond that belt to either side there is little reason to expect sites of this kind. Table 4:1 lists parishes with at least three deposition sites, and the full list is at the back of the book, also sorted by parish. In Uppland a dense belt of rich parishes stretches from Enköping to Uppsala and centres upon Skogs-Tibble parish, while in Södermanland the richest area centres on Lake Sillen and Torsåker parish. In Västmanland and Närke, only the lowlands bordering Lakes Mälaren and Hjälmaren appear worthwhile in this kind of search.

Table 4:1. Parishes with at least three deposition sites

Parish	Sites
Nä, Ekeby	6
Nä, Glanshammar	4
Nä, Lännäs	4
Sö, Björkvik	4
Sö, Björnlunda	4
Sö, Eskilstuna	7
Sö, Frustuna	4
Sö, Hölö	4
Sö, Sorunda	4
Sö, Torsåker	3
Sö, Tunaberg	3
Sö, Turinge	4
Sö, Vårdinge	6
Sö, Västerhaninge	3
Sö, Ytterenhörna	3
Sö, Ärla	3
Sö, Överjärna	3
Up, Altuna	3
Up, Bred	6
Up, Bälinge	3
Up, Fröslunda	3
Up, Gamla Upp-	5

sala	
Up, Gryta	3
Up, Hagby	5
Up, Lena	9
Up, Litslena	3
Up, Lohärad	3
Up, Nysätra	5
Up, Rasbokil	3
Up, Simtuna	7
Up, Skepptuna	3
Up, Skogs-Tibble	9
Up, Sparrsätra	3
Up, Spånga	3
Up, Stockholm	3
Up, Tensta	3

Up, Tierp	5
Up, Tillinge	3
Up, Torstuna	7
Up, Uppsala-Näs	4
Up, Vårfrukyr-ka/Enköping	9
Up, Vänge	4
Up, Ärentuna	3
Up, Österunda	5
Vs, Björksta	4
Vs, Fellingsbro	5
Vs, Hubbo	4
Vs, Munktorp	3
Vs, Svedvi	6
Vs, Tortuna	3

Step 2. Where were the Bronze Age lakes and sea inlets?
Only 13% of potential deposition sites with good location data are on land that was dry and distant from water in the Bronze Age. And in choosing between different types of Bronze Age wet environment, freshwater lakes and sea inlets and their shores are the most productive. Streams show intermediate numbers. Apparent Bronze Age bogs are not very productive. At the time of writing, the most comprehensive, consistent and accessible way to get access to quaternary geology's ideas about shoreline displacement and drainages over time in the study area is the Swedish Geological Survey's on-line map service. This will of course be superseded as research in that field advances, and a future reader of this book may no longer have access to it. I trust that with time even better data sources will become available to archaeologists who wish to know where Bronze Age lakes, sea inlets and streams were.

Step 3. Where did the water do something interesting?
Look for the entrypoints and exits of streams, for rapids (or farmsteads named something with *-fors-*), for narrows in lakes and sea inlets, indeed for long narrow lakes and inlets in general (such as the many *Långsjön*), for the sunlit south side of islands and promontories in the sea. Also keep an eye open for the southern terminals of gravel ridges, immediately above Bronze Age waters.

Step 4. Is your candidate basin the right distance from Bronze Age settlement?
Make note of where the area's burnt mounds and rock art are. Deposition sites are typically located 1.8 km from the nearest burnt mound and 1.7 km from the nearest rock art – usually cupmarks but sometimes figurative carvings as well.

Step 5. Auger the basin, then machine strip while metal detecting
Following the corridor of a projected highway across the landscape, steps 1–4 above will allow the contract archaeologist to identify promising basins in the terrain. Those that have long been drained and ploughed can immediately be evaluated with the aid of a metal detector. But basins with preserved wet sediments will demand machine stripping as well, for two reasons: augering will often prove the sediments to be thicker than the range of a metal detector, and wet sediments preserve organics that cannot be

sensed remotely with current technology. Where a highway project crosses a promising basin, machine strip the sediments in layers of no more than 20 cm while metal detecting, and be prepared to call in a quaternary geologist and palaeobotanist to document and sample the stratigraphy if you come across a deposit.

I believe that if this procedure is adopted by contract archaeologists in the study area, we will not have to wait another 30 years for our next Bronze Age hoard. And with luck, it will be found by people who can document and sample its find context.

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This section is intended to be complete, but I haven't gone through it and made the format consistent. The only comments I need on the bibliography at this stage are a) "This title in the bibliography gets no references in the text" and b) "This reference in the text has no corresponding entry in the bibliography". /MR

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