

RESEARCH ARTICLE

The Late Bronze Age hoard from Bækkedal, Denmark – new evidence for the use of two-horse teams and bridles

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ABSTRACT

In late summer 2014, two metal detectorists located 40 bronze objects on a small hillock west of Gammel Skørping in Himmerland. Eastern Himmerland in particular is renowned for its many Late Bronze Age hoards and the Bækkedal hoard, as the discovery is now known, underlines this trend as it represents a multi-type hoard from Late Bronze Age period V. The hoard, which was undergoing progressive plough disturbance, contains both male and female items and, astonishingly, also several metres of well-preserved leather straps that had once formed parts of bridles and harness. Moreover, several bronze fittings, including cheek pieces and phalerae, were in situ on the leather straps, thereby enabling parts of the bridles to be reconstructed. The many bronze harness-related objects show that the hoard represents the components of bridles for a two-horse team. This article gives a preliminary presentation of the hoard, with a particular focus on the metal objects and horse harness, which are then placed in a broader northwest European context.

ARTICLE HISTORY

Received 3 July 2015
Accepted 28 October 2015

KEYWORDS

Horse harness; bridle; Nordic Bronze Age period V; hoard; cheek pieces; four-wheeled wagon

Introduction

Archaeological investigations of new Bronze Age hoards are a rarity, as most of the known hoards in southern Scandinavia were discovered between the late nineteenth century and the mid-twentieth century, in connection with peat cutting, draining and so on (Kristiansen 1978, pp. 126–148, 1985). It therefore came as a considerable surprise when two metal detectorists discovered about 40 bronze objects on a sandy hillock west of Gammel Skørping in Himmerland (Figure 1). The area had apparently not been subjected to metal-detector survey previously and the nearest recorded ancient monument is a barrow located c. 500 m to the northwest. A systematic detector survey of the plough soil over subsequent days revealed further 170 objects and fragments. Their number increased drastically towards what proved to be the deposition site. The surface finds comprised in particular fragments of female ornaments, together with a few male items, but several fittings from a bridle, including a cheek piece, were also located. The bronze objects date from Late Bronze Age period V, c. 900–700 BC.

The subsequent archaeological excavation revealed that the bronzes had apparently been contained in a pottery vessel, of which only the lower third remained (Figure 2). The damaged vessel was taken up in a plaster-cast block so it could be excavated under more satisfactory conditions in the conservation lab at Bevaringscenter Nordjylland. In addition to computed tomography (CT) scanning, the contents of the block and the relative positions of the objects were recorded with the aid of a 3D model (Jensen 2012). This subsequently proved to be very useful in the interpretation and reconstruction of the horse harness.

The archaeological investigations showed that the pot had stood in the top of the subsoil and in the plough soil. No traces of an obvious cut feature were apparent around the pot and a network of trial trenches across the hilltop revealed only five cooking pits and two postholes. There were no traces of a grave or other feature that could provide an indication of the area's function in the Late Bronze Age.

The actual find site is located c. 38.5 m above sea level on an elongated sandy hillock. This hillock, which measures 65 × 100 m, lies to the east of Bækkedal, which is a small gully associated with

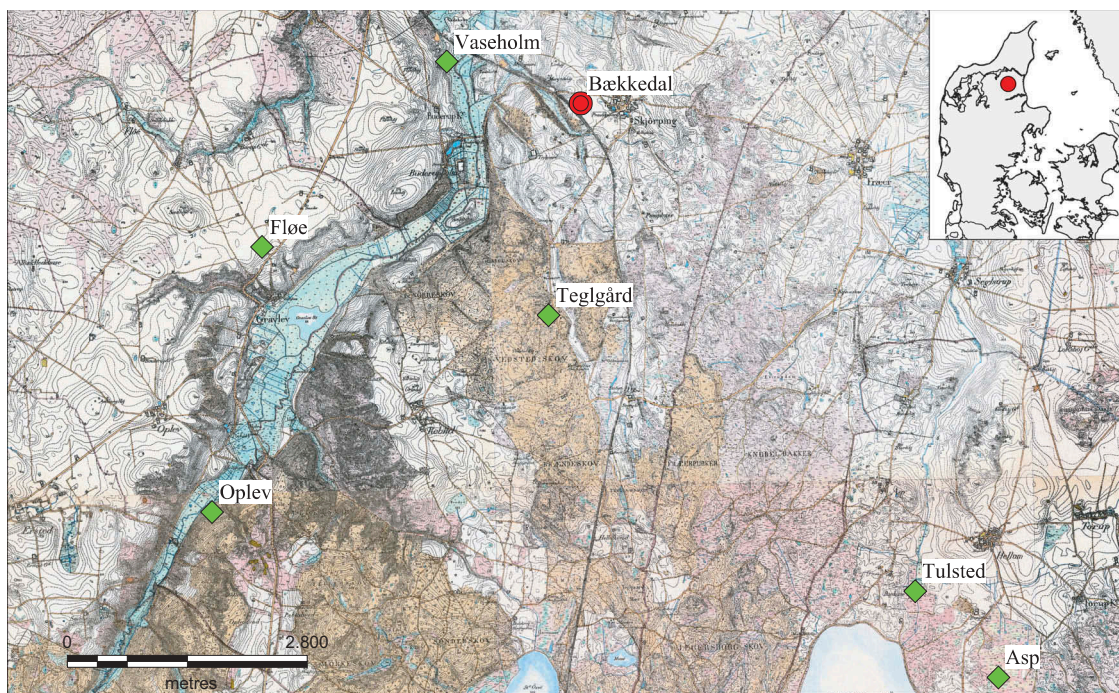


Figure 1. The find spots for the Bækkedal hoard and other multi-type hoards from the Late Bronze Age. The river valley Lindenberg Ådal can be seen to the west. Only the Vaseholm hoard was definitely found in a bog. The hoards at Teglgård, Fløe and Oplev were discovered on heathland in association with large stones (Frost 2008, pp. 132–142). The Asp hoard was found during ditch digging, while that at Tulsted was discovered on heathland during tree planting. The background is an ordnance map from the 1880s.



Figure 2. The lower third of the slip-covered pottery vessel in which the bronze objects lay. Its maximum diameter is c. 31 cm.

the distinctive river valley Lindenberg Ådal. In pre-history, it was possible to sail from here out to the Limfjord, which lies c. 20 km away as the crow flies, by way of two river routes, following either Østerå or Lindenberg Å. The Kattegat is 23.5 km to the east. The surrounding moraine landscape, which was formed during the last ice age c. 12–16,000 years ago, is sharply undulating (Münier 2009, p. 33). Immediately to the south lies Rold Skov, which is

one of Denmark's largest forests and, as demonstrated by pollen data from Store Økssø (Odgaard and Nielsen 2009, p. 49, Nielsen and Odgaard 2010, p. 381), was also a forest back in the Bronze Age. In the Late Bronze Age, the area was also characterised by grass-dominated commons and heath. The importance of the Skørping area at this time is underlined by records of a further six multi-type hoards found within a c. 8 km radius of the Bækkedal hoard (Figure 1) (Frost 2003, 2008). None of these, however, contains horse harness.

A closer examination of the distribution of the metal finds located by metal detector reveals that they mostly lie within a c. 10 × 45 m area, oriented in the direction of ploughing (Figure 3). A few large objects were found as far as 88 m from the actual deposition site. An analysis of the distribution of 200 bronze objects and fragments, in relation to their weight, shows that the numerous very light items lie relatively close to the site of deposition while there is a tendency for the slightly heavier objects (>25 g) to be found in the marginal zone. The average weight of the 200 bronze objects that were surveyed and plotted is 9.88 g, which reveals something of the degree of their fragmentation.

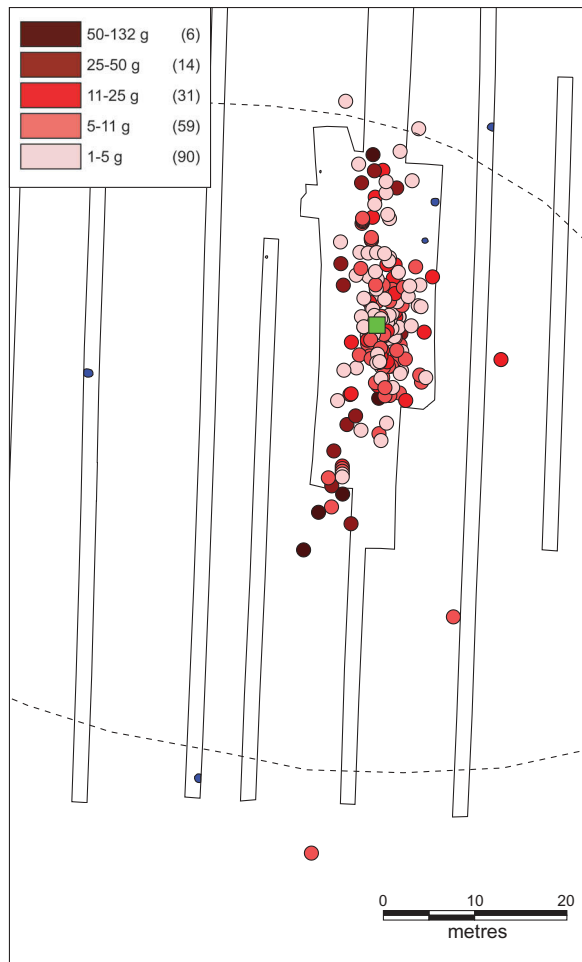


Figure 3. Distribution of the 200 metal-detector finds in the plough soil. The numbers in the various weight categories are shown in brackets. The green square marks the deposition site of the hoard. Trial trenches and the excavation trench are also shown. Cooking pits are marked in blue and the broken line follows the 37.5 m contour above sea level. (for colour image please see online article).

Examination of several series of orthophotos, taken between 1954 and the present day, shows that the ploughing direction has apparently remained unchanged over the last 60 years.¹ This explains why the finds are mainly distributed in the N–S direction. However, the limited degree of corrosion suggests that the bronze objects had probably only been exposed in the plough soil for a few years. Several are heavily fragmented, including one of the suspension vessels, which is represented by at least 87 pieces. Analysis of the ornamented part, which consists of 68 fragments, shows that c. 65% of this vessel was found during the detector survey. The degree of fragmentation of the other types of finds, including neck rings and a razor, follows a similar trend. Fragmentation aside, the surface of

both the intact bronze objects and the fragments is generally well-preserved with a homogeneous verdigris patina.

The finds

The finds comprise c. 145 bronze objects, depending on how they are counted, representing horse harness, male- and female-related objects and some other artefacts; a gold oath ring was also found (Table 1). The combined total weight of the metal artefacts is c. 4.9 kg. Of this, 2.8 kg was recovered from the plaster-cast block and 2.1 kg from the plough soil: this should be seen in relation to an average weight for period V hoards of c. 1 kg (Verlaeckt 2000, p. 201). It was mainly the male and female objects that were recovered from the plough soil, while the harness and associated bronzes were apparently located lowermost in the pottery vessel, which explains why the leather straps are preserved.

Table 1. Numbers of metal objects of the various types found in the bronze hoard from Bækkedal. Question marks denote uncertainty about the numbers, given that many of the objects are heavily fragmented. In the case of rings, examples that form parts of sets of jingle plates or which were found associated with ornamental buttons are not included.

Type of object	Number
Horse harness	
Cheek pieces	4
Terret fittings	2
Phalerae	10
Sets of jingle plates	8
Ornamental buttons	14
Ribbed bronze cuffs	26?
Female objects	
Tutulus	1
Suspension vessels	2
Cuff arm rings	2
Bundles of thin spiral neck rings	2
Narrow band-like arm ring	1?
Spirals	2
Twisted neck rings with oval terminals	2
Male objects	
Gold oath ring	1
Celt	1
Razor	1
Lancet	1
Other	
Rings	28?
Bar buttons	14
Zoomorphic protoma	1
Bronze-working waste	1
Sickles	7
Bronze terminal from leather belt	2
Triangular jingle plates	10
Terminal knob	1
Other	1
Total	145

In the following, the most important finds groups will be presented, with a special focus on the metal objects. The leather straps and other organic material are not yet fully conserved and scientific analyses remain to be carried out. A summary of the numbers of finds is given in [Table 1](#).

Horse harness

The Bækkedal hoard contains a number of bronze harness-related artefacts of types that tend particularly to be found in hoards within the sphere of the Nordic Bronze Age (von Brunn 1981, Pare 1989, p. 86; Verlaeckt 2000, p. 196). Common types are phalerae and jingle plates, although bits, cheek pieces and other items also feature in these hoards. Many of the less frequently occurring types, such as cheek pieces, tend to have a very individual character. This is also true of the Bækkedal hoard, which contains four sturdy cheek pieces of a type for which there are no recorded parallels ([Figures 4 and 5](#)) (e.g. Thrane 1965; Hüttel 1981; Metzner-Nebelsick 1994; Dietz 1998). The cheek pieces are virtually symmetrical about a circular aperture that accommodated the bit. The cheek straps were attached to the rectangular terminals, which are open, with the aid of thin sinews threaded through two holes. At one end of each cheek piece is an eye in which a set of jingle



Figure 4. Part of a bridle in situ in the plaster-cast block. The same part is shown exposed and recovered in [Figure 5](#). The length of the cheek piece is c. 13.8 cm.



Figure 5. Well-preserved part of the bridle with cheek piece, jingle plates, ornamental buttons, cross-ribbed bronze cuffs and phalera.

plates is mounted. The cheek pieces, like the two terret fittings, are decorated with bands of plastic ornamentation. This shows that the horse harness was manufactured as a set and not assembled from random bronze components.

All the visible cheek straps are fitted with and covered by cross-ribbed bronze cuffs, made of thin sheet metal and open to the rear. As a consequence, they are in many cases poorly preserved and their number is based on an estimate. These cuffs are up to 6.5 cm in length and several have small attachment holes on the reverse. Similar cuffs feature in hoards found along the southern Baltic coast, for example at Ückeritz, but also occur in Danish hoards, such as Fangel Torp and in the Lusehøj burial (Sprockhoff 1956, p. 270; Lampe 1982, p. 36; Thrane 1983, p. 5, 1984, p. 142). In many places on the reverse of the cheek straps there are rows of light rhombuses ([Figure 6](#)),² which apparently occur where the leather was woven together in connection with the attachment of ornamental buttons and rings of bronze.

The 14 ornamental buttons are circular and domed, with a flat area bearing the ornamentation. The latter consists of four encircling lines. On the reverse is a perforated shank for attachment. In five cases, small rings with a diameter of c. 2 cm were found associated with the ornamental buttons, but in only one instance could the position of an ornamental button with a ring be established more precisely



Figure 6. Close-up of the reverse of one of the cheek straps with the rhombic inlays. Also visible are a selection of the many leather straps, the reverse of a phalera and several cross-ribbed bronze cuffs.

in relation to the bridle (Figure 5). We are unable to explain the function of this ring, apart from serving for the attachment of something or other. A similar ornamental button was found in the Fangel Torp hoard, which also contained parts of two sets of jingle plates (Thrane 1983, p. 11). The diameter of the Fangel Torp button is c. 4.2 cm, while that of the ornamental buttons in the Bækkedal hoard is 3–3.2 cm.

The phalerae are another type of harness fitting that can be equated in function with the ornamental buttons. The hoard contains ten examples, of which eight are virtually intact or represented by larger fragments, while two are merely represented by their bosses. Some fragments were found in the plough soil and several more may well have been present originally. The four presumed to be associated with the bridles have diameters of 11–12 cm, while the diameter of the four others is c. 15 cm. In several cases there are U-shaped shanks on the reverse, and in a few instances the phalerae still sat on the leather straps. They were attached by the shank being pressed through a small slit in the leather strap and then secured on the reverse by a smaller leather strap threaded through an aperture in the shank (Figure 7). The phalerae from Bækkedal appear to be related to many other Danish examples (e.g. Larsson 1974, pp. 201–202).

Returning to the sets of jingle plates, there appear to be several different types, depending on their



Figure 7. Reverse of a phalera mounted on cheek strap.

position on the harness. The four sets of jingle plates mounted directly on the cheek pieces are of types that consist exclusively of two or three circular plates with a thickened beaded margin. The four other sets, which probably sat further back on the horse's head, were mounted directly on the bridle with the aid of a bronze ring and a loop in the leather strap (Figure 8). A second bronze ring optimised their jingle function. Each set consisted of two cones and two or three round or broadly-oval plates; in two of them the hanging plates have a hole at their centre. The various types perhaps represented an affiliation to a particular horse in the team. Common to all of them is the presence of a suspension eye. In the case of the circular plates, the eyes are linked by a short bar. There are no similar examples in the south Scandinavian or north German records (Sprockhoff 1956, pp. 258–259; Thrane 1975, pp. 122–124).



Figure 8. Example of jingle plates mounted on a leather strap with the aid of a loop (red arrow). These were probably located on the horse's cheek. Also visible are some of the many well-preserved straps. (for color image please see online article).

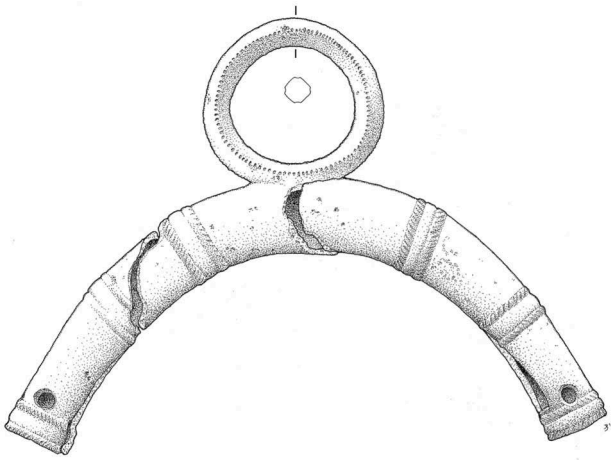


Figure 9. Terret fitting. Note that it is decorated in the same way as the cheek pieces. Its internal diameter is c. 9.8 cm.

Finally, there are the two terret fittings (Figure 9), which are rather reminiscent of the examples found in such as the Turup and Fogdarp hoards, being hollow and spur-shaped with triangular perforations on the reverse (Larsson 1974, pp. 176–178, 188). The terret fittings from Bækkedal also have holes at the sides, near the base of the tube. They also differ in having either a large eye uppermost, while the other examples have either human-like heads or circular bronze tubes in this position (e.g. Broholm 1953, no. 211; Larsson 1974, p. 192). Their function was, however, the same – the device uppermost on the tube

had the role of controlling the reins. Consequently, the harness fitting sat lowermost, by the mane, as underlined by its curvature. One of the fittings from Bækkedal had thin leather straps preserved which presumably were used for mounting on to a collar or directly on to the harness, for example with the aid of rings or bar buttons.

If we summarise the above, the presence of two terret fittings, four cheek pieces and eight sets of jingle plates, suggests that the bronzes represent the components of bridles for a two-horse team (Figure 10). In one instance, the cheek strap was found in situ on the cheek piece, together with ornamental buttons and a phalera. We do not know how the two cheek straps were attached to the other side of the phalera, but one suggestion is that there was an ornamental button here which had a connecting function. This concurs with the fact that the number of ornamental buttons in the hoard exceeds the 12 required to secure the cheek straps at the cheek pieces. Other preserved straps show, moreover, that the cross-ribbed bronze cuffs continue on the other side of the phalera. This suggests that there was some form of complex arrangement which joined the two cheek straps. It has not proved possible to see remains of a nose-band. Other unresolved questions relate to the set of jingle plates that, in the reconstruction, are placed on

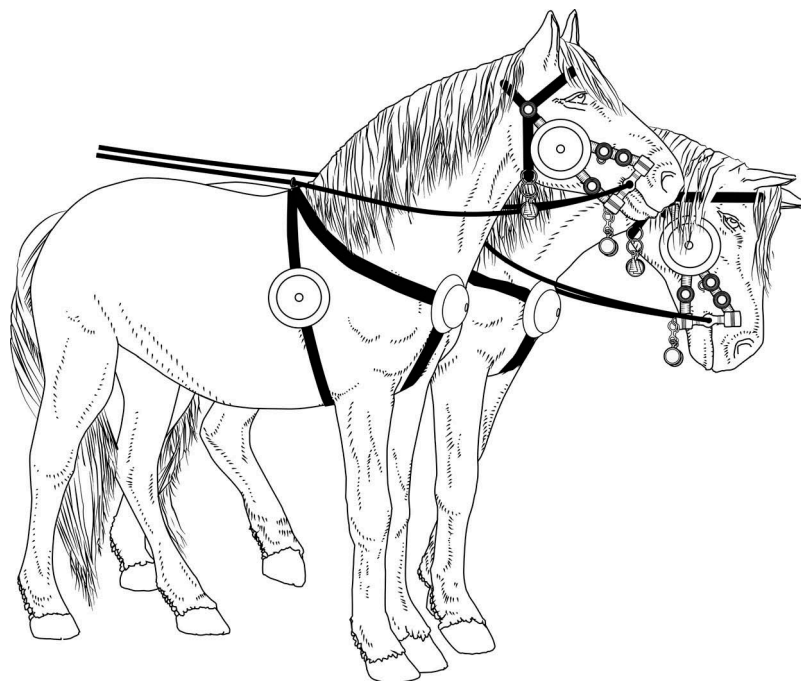


Figure 10. Reconstruction of the bridles from Bækkedal. Drawing: Jeppe Boel Jepsen.



Figure 11. Close-up of whipped rope bit.

the horse's cheek. Their exact position is unknown – only their method of attachment and the fact that they were affixed to a 1.4 cm wide strap which was probably part of the bridle.

Finally, the bit should also be touched upon. This is made of organic material – sturdy, almost whipped cord, giving a certain thickness (Figure 11). Rope appears to have been chosen despite the fact that several bronze bit types are known from the Late Bronze Age, for example the Høve type with a bipartite mouthpiece (Thrane 1975, p. 122; Hüttel 1981). The simple, several metre long leather straps found in the hoard are presumed to represent the reins. However, there is nothing in the hoard to indicate how and where the reins were attached in relation to the cheek piece. One possibility is that they were attached directly to a loop or similar arrangement on the bit. Otherwise they must have been attached to the lower part of the cheek pieces. A more detailed comparison between the horse harness from Bækkedal and other finds is given below in the final section.

Female objects

The female objects comprise a number of items that are characteristic of hoards; some can be seen as sets of ornaments, while others presumably represent similar objects belonging to several different individuals (e.g. Kristiansen 1974, p. 23, Thrane 1975, p. 170). The possible ornamental sets consist of a suspension vessel, a tutulus and two cuff arm rings, whereas two twisted neck rings, two small spirals and two bundles of spiral neck rings cannot be interpreted in the same way (Figure 12). The Bækkedal hoard also contains a second suspension vessel and parts of a narrow band-like spiral arm ring, which are similarly considered to be the female objects.

The two suspension vessels are of different sizes and shapes. The smaller of the two has a maximum diameter of 16 cm (Figure 13) and is c. 6.8 cm tall, excluding the eyes. The vessel is almost intact, but five fragments were also found in the plough soil. In the plaster-cast block taken up for excavation the suspension vessel lay vertically alongside the pottery vessel, showing that it has been struck by the plough. The base is decorated with punched ornamentation, divided up by furrows into several zones. The decoration could not be cleaned as it was decided to preserve some of the organic material found in the



Figure 12. Examples of female objects: Tutulus, cuff arm ring, spirals and parts of the twisted neck rings.



Figure 13. The inner part of the small suspension vessel. The dark areas are bast, while leather remains can just be perceived on the edge of the vessel. Also visible are bundles of neck rings, lashed together with light-coloured plant fibres.

suspension vessel in situ. The latter includes leather items and bast that were used as a kind of lining, perhaps to reduce rattling of the contents and make the vessel more comfortable to wear. The vessel also contained the two bundles of thin spiral neck rings which are held together by light-coloured fibrous material (Figures 14 and 15). Similar spiral neck rings are known from several other hoards, including that from Voldtofte on Funen (Thrane 1971). The suspension vessel also contained a golden oath

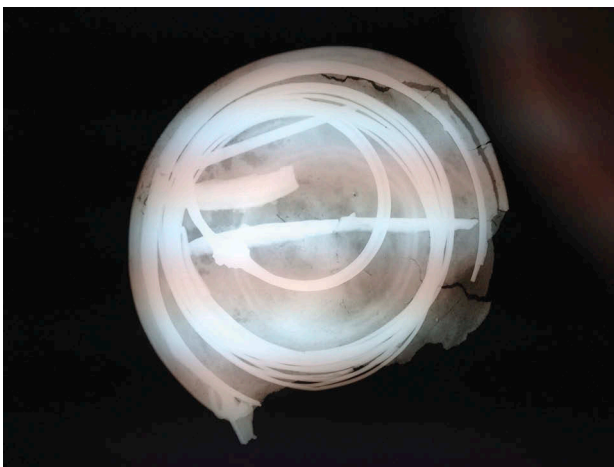


Figure 14. Radiograph of suspension vessel prior to excavation. In addition to bundles of neck rings, the oath ring, lancet (tang) and parts of two sickles can also be seen.

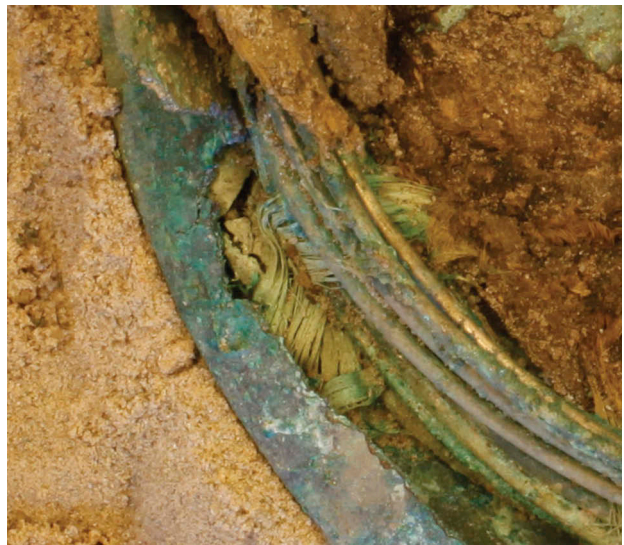


Figure 15. Close-up of plant fibres and neck rings.

ring, a fragmented lancet and parts of two sickles. These finds are dealt with in more detail below in connection with the male equipment and other artefacts.

The second suspension vessel is, as mentioned above, heavily damaged (Figure 16). It lay scattered over an area of c. 9 × 42 m and the ornamented part, the base, comprises 72 fragments, while the sides are represented by 20 fragments. The base of the vessel had a diameter of c. 29 cm, while the height of the sides was 3.5 cm.³ The base is divided up into five

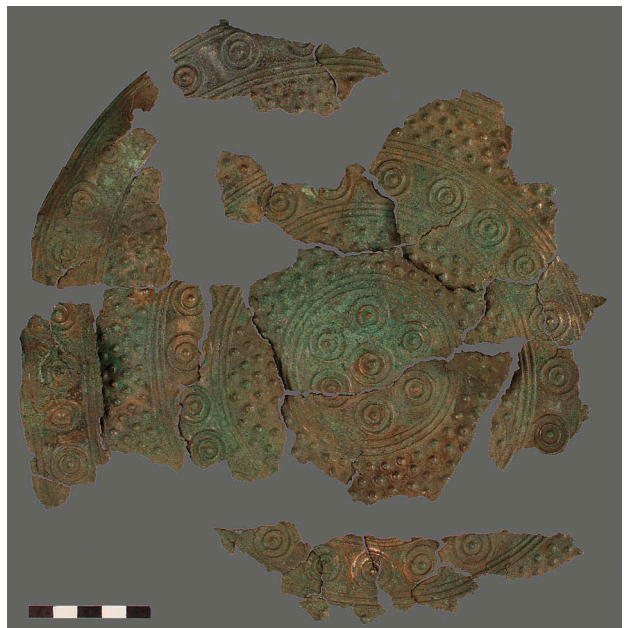


Figure 16. The ornamental plate from the suspension vessel found in the plough soil.

zones by three encircling mouldings, which imitate cord. The individual zones are ornamented alternately with cast bosses and circles. There is also plastic, cord-like ornamentation on the sides, at the transitions between the shoulder, neck and base. At the mouth of the vessel there are remnants of an internal ledge, at least 1 cm in width, perforated by opposing triangles. One fragment shows that this ledge has had a small eye for attaching the vessel to a belt. An almost identical suspension vessel has been recorded from Vester Doense near Hobro, where it was found together with the remains of a cord skirt (Brøndsted 1958, p. 203; Sprockhoff and Höckmann 1979, p. 88).

The Bækkedal hoard also contains a tutulus bearing exactly the same type of ornamentation as seen on the large suspension vessel, suggesting that they formed part of the same belt set (Friis 1968). The tutulus had lain in the upper part of the pot and had therefore suffered plough damage. It was originally hemispherical with a cylindrical tip on which there is a decorative disc. Its height is c. 10.5 cm and its surface is covered with zones filled out with bosses and circles, separated by plastic ornamentation. On the reverse of the tutulus is a slit and something that resembles a bar button for attachment to a belt.

The hoard includes seven fragments of one or more band-like spiral arm rings with a central rib (see for example Ørsnes 1959, pp. 22–25; Kristiansen 1974, p. 20). Further to these are two almost identical cuff arm rings. The 18 fragments that constituted one of these were found exclusively in the plough soil, while one was found in the pot. The arm rings are decorated with six moulded ribs on which there were two or three eyes for the attachment of jingle plates in the form of rings or similar (e.g. Baudou 1960, p. 62). The width of one arm ring is 7.4 cm, while that of the damaged example cannot be measured. At the ends of the arm rings there are two triangular holes which are fastening devices of some kind. Cuff arm rings have been found in a number of hoards where they often appear as a set, for example in the Fårdal hoard found near Viborg (Kjær 1927, p. 248).

Finally, nine fragments making up two twisted neck rings with oval terminals should be mentioned. One of the rings is slender with narrow, almost pointed-oval terminals and hooks for fastening; its terminals are decorated with finely incised lines and zigzag patterns. The other ring is more robust and

only one broad terminal, ending in a spiral, is preserved; this is decorated with bows and narrow, diagonally hatched bands. It is of a type known from most of Denmark, Scania and northern Germany (Baudou, 1956, p. 29, Sprockhoff 1956, p. 154, Karte 29).

Male objects

A feature of hoards containing horse harness found in southern Scandinavia and the southern Baltic area is that the harness fittings are often accompanied by ornaments and other female objects, while male equipment occurs less frequently (von Brunn 1981, p. 115; Varberg 2013, p. 148). This situation is clearly reflected in the Bækkedal hoard, which contains about three times as many female items as male items. On the other hand, the male items constitute an exclusive group, comprising a bronze celt of Seddiner type, a gold oath ring, a razor and a lancet. Their special status is demonstrated by several of these artefact types having been found in particularly rich burials, such as the princely grave at Seddin in Brandenburg (Thrane 1984, p. 168 with references). It is true in particular of the 8 cm long bronze celt, which differs from the eponymous axe from Seddin in that it is ornamented (Figure 17). It therefore belongs to a small group of ornamented axes found

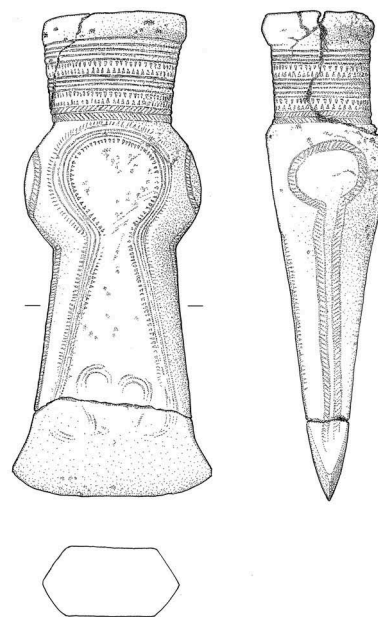


Figure 17. Axe of Seddin type. Note that the narrow face is also ornamented.

especially on Funen and in Scania (Thrane 2014), but the type has also been recorded across an area extending from the southern Baltic to the Netherlands (Sprockhoff 1956, Karte 9).

The socket is ornamented with lines, oblique strokes and small punched triangles, while the same ornamentation is repeated on both the narrow and broad sides in the form of a linear band. On the broad faces, near the edge, there are coiled spirals which almost resemble ship's prows (Kaul 1998, p. 163). This cannot be considered as a working axe, more as a weapon or prestige object.

As mentioned above, the hoard includes a gold oath ring and a lancet contained in a small suspension vessel. Only the tang and a little of the blade are preserved from the lancet and it must have been broken in antiquity as it lay wedged in beneath the neck rings. The tang is ornamented with a zigzag pattern flanked by strokes, while the small part of the blade still attached is decorated with a bow pattern. It is not known precisely what lancets were used for, but in several cases they have been found in male graves together with other male items such as razors and tweezers (Broholm 1953, no. 144; Sprockhoff 1956, p. 86). The oath ring, which only weighs 41 g, belongs to a small group of narrow band-like oath rings that are made of folded sheet gold and are therefore hollow (Figure 18) (Baudou 1960, p. 67; Knoll, Meller & Filipp 2014, p. 819). Oath rings are known primarily from hoards but have in a few cases also been found in graves, for example in the Voldtofte area (Thrane 1984, p. 163).

The hoard also includes a fragmentary razor, found in three pieces in the plough soil. It had a spiral- or S-shaped handle, but this is not preserved. The razor bears images of two almost identical ships



Figure 18. Slender gold oath ring with round decorated terminal knobs.

with S-shaped prows. By the prow of one of the ships are several centre-pointed double circles that probably represent suns.

Other finds

As can be seen from Table 1, the hoard contains a number of other finds that cannot be assigned to gender. These include 14 bar buttons/bars that, with two exceptions, were found in the plough soil (Figure 19). The bar buttons are of slightly different types: All have straight, grooved bars, but the eyes differ (Baudou 1960, p. 90). Seven have grooves and six do not. On 11 of them, the eye is oriented parallel to the bar, while two have transverse eyes and the orientation could not be determined on one. The two with transverse eyes, which turned up in the plaster-cast block a few centimetres apart, still had leather remnants in the eyes. This indicates that the bar buttons should be seen being related to the horse harness, perhaps being used for the attachment of straps and the like. A similar interpretation applies

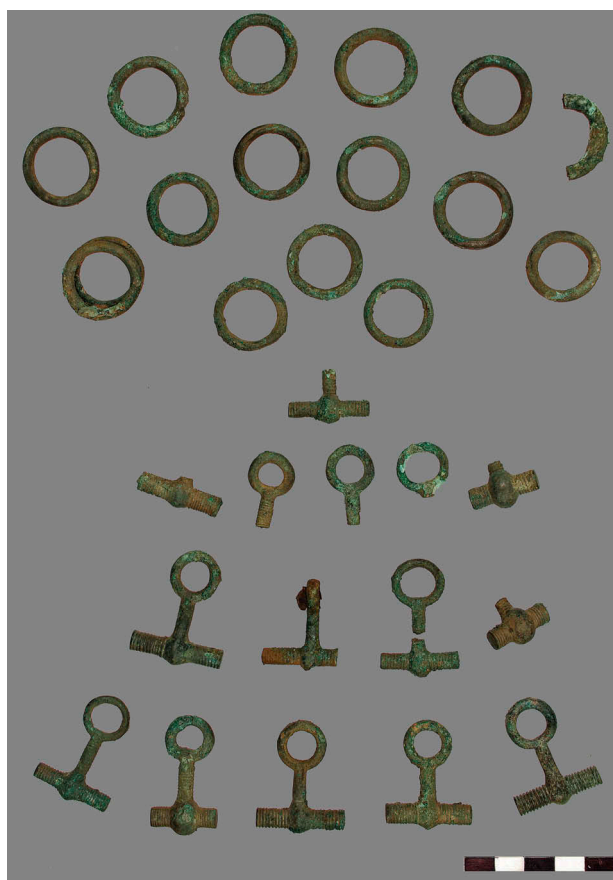


Figure 19. A selection of bar buttons and rings.

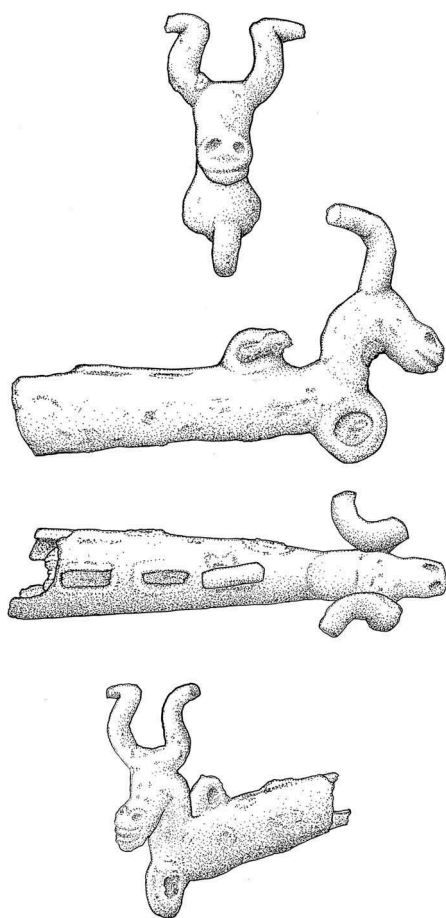


Figure 20. Zoomorphic bronze protoma.

to some of the numerous loose rings in the hoard (Figure 19). These can be divided up into two groups: 17 have a diameter of 2.5–3 cm, while ten smaller rings have a diameter of only c. 1.7 cm. In several cases, the smaller rings were found linked together in twos or threes.

The Bækkedal hoard also includes a curious small bronze figure that possibly represents a bull (Figure 20). It is only 5 cm in length and near the head are two eyelets for the attachment of something – jingle plates perhaps. At the opposite end is a socket containing wooden remnants, indicating that the piece could have functioned as some kind of fitting. Its diameter is c. 1.1 cm. Similar, but longer, figures are recorded from Egemose in southwest Funen and Skjerne on Falster, where they are interpreted as furniture for ceremonial wagons (Broholm 1949, p. 266; Jacob-Friesen 1969, p. 156). This tradition apparently continued into the Pre-Roman Iron Age, when small bull figures are found associated with the Fredbjerg

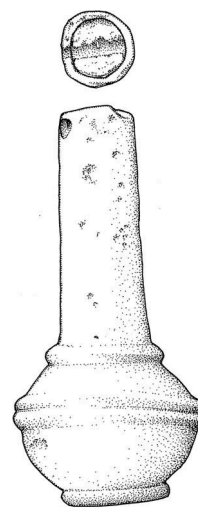


Figure 21. Tubular bronze object with rounded terminal knob.

wagon (Schovsbo 2007, p. 96). Another object that cannot be identified more closely is a tubular piece of bronze with a rounded terminal knob (Figure 21). Its socket also contains wooden remnants and it probably sat at the end of a wooden shaft or similar.

The more curious department also includes two cast bronze fittings probably representing the terminals of a leather belt and ten c. 10 cm long triangular jingle plates (Figure 22). These artefacts are not joined together but their ornamentation, which consists of parallel rows of strokes, bows and cross-hatching, suggests that they should be seen as a set. They also have a few parallels elsewhere, for example in the Faardal hoard and in a richly-furnished grave in Albersdorf in the Ditmarshes in Schleswig (Kjær 1927, pp. 250–253; Sprockhoff 1956, Tafel 71; Menke 1972, Tafel 59). These latter finds show that the jingle plates hung in chains beneath the fittings, which explains the presence of some of the linked rings of small diameter. The fittings are just less than 8 cm in width and therefore slightly wider than those from Fårdal. As was the case with the examples from Fårdal and Albersdorf, the jingle plates appear only to have hung from one of the fittings, as indicated by the remains of suspensions.

Finally, fragments of seven sickles should be mentioned. Several of these have one or two dorsal pegs or studs. Sickles feature commonly in period V hoards and in both male and female graves across a large geographic area (Baudou 1960, p. 45).



Figure 22. Triangular jingle plates and belt fitting.

Horse harness in the Late Bronze Age – conclusions

Horse harness is found particularly in the Late Bronze Age hoards of southern Scandinavia and the southwestern Baltic area: In southern Scandinavia alone there are 33 examples, while in the southwestern Baltic area there are 60 (von Brunn 1981; Varberg

2013) (Figure 23).⁴ These hoards comprise a mixture of horse harness and, especially, female objects, although male items and non-gender specific artefacts also occur. It is, however, rare for a complete set of harness, as evident in the Bækkedal hoard in the form of cheek pieces, bits, phalerae, jingle plates and terret fittings, to be present. In only a few cases do the

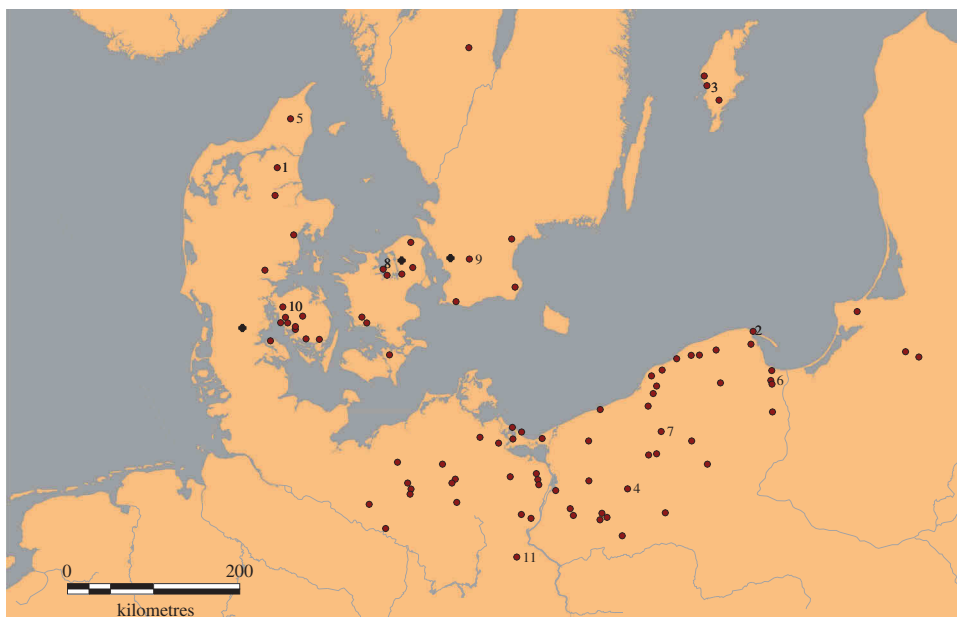


Figure 23. Distribution of finds of Late Bronze Age horse harness in southern Scandinavia and the southern Baltic area. Circles mark hoards and crosses mark graves. Selected finds refer to Table 2. 1. Bækkedal, 2. Rekau, 3. Eskelhem, 4. Karbow, 5. Sæsing, 6. Pyritz, 7. Ückeritz, 8. Løvbjerggård, 9. Fogdarp, 10. Turup, 11. Stolzenberg. Data from Varberg (2013), von Brunn (1981) and Larsson (1974). Two find sites are situated outside the map section.

Table 2. Selected finds of horse harness for two-horse teams in the Nordic Bronze Age sphere together with finds combinations. The find sites refer to the distribution map shown in Figure 23.

Find-place	Cheek pieces	Terret fittings	Horse bits	Jingle plates	Phalerae
Bækkedal	4	2	2?	8	10
Rekau	3			3	2
Eskelhem	4		2	4	12
Karbow	4		2		14
Sæsing	4			x?	
Pyritz	4			3 + 1	5
Ückeritz	7 + 4	2		13	54
Løvbjerggård		2	1	2	11?
Fogdarp		2		4	4
Turup		2			2
Stolzenberg		2		4	12

hoard contents provide a fuller picture of how the horses in a team were equipped with bridles and harness and how these were decorated. The type of wagon drawn by these horses, and how the pole was mounted, are further questions to which these hoards provide very few answers (e.g. Schovsbo 2007, pp. 100–101, 2010, p. 18).

A small group of hoards stands out from the rest in that they either contain two bits, two terret fittings or four cheek pieces (Table 2), thereby giving a clear indication of the use of a two-horse team. But in general the hoards convey a rather more mixed impression. Do they, through the presence of a few individual components, perhaps represent the presence of a two-horse team, saddle horses or something else on a different and more symbolic level? Closer examination of the individual components of the various richly-furnished hoards reinforces the impression that some of these depositions represent complete sets of horse harness. The period VI Eskelhem hoard from Gotland, the contents of which include four identical cheek pieces, four sets of jingle plates, 12 phalerae and two bits of central European origin, is therefore a good example of what can be taken to represent the bridles of a two-horse team (Jensen 1997, p. 180). Similarly, the four cheek pieces in the hoards from Karbow in northern Germany and Pyritz in Pomerania are also identical and the Karbow hoard includes a mould for an axe of Seddin type, 14 phalerae and two bits (Sprockhoff 1956, p. 34; Thrane 1965, p. 70). The Pyritz hoard includes seven twisted neck rings, five phalerae or decorative discs and three sets of jingle plates (Sprockhoff 1956, p. 52; von Brunn 1981, Tafel 49), as well as a ring with three jingle

rings. In the hoard from Rekau in Pomerania there were only three cheek pieces and three sets of jingle plates – thereby suggesting a two-horse team, even though the equipment is incomplete (Sprockhoff 1956, p. 54). Finally, the hoard from Sæsing in northern Jutland should be highlighted, not only due to the slightly unusual horse harness it contains, but also because the four cheek pieces are not a complete match: three of them are identical, while the fourth differs somewhat in size and form. A further unusual aspect of this hoard is its four oval decorative plates and five disc/wheel-shaped suspension plates, which possibly represent jingle plates (Friis 1961, p. 43; Thrane 1965, p. 50). Similar oval ornamental plates are evident in a hoard containing horse harness from Nymö in Scania and in hoards from northern Germany, where the plates are, however, pinched in at each end (Thrane 1965, p. 57).

The hoard from Ückeritz stands out by containing a very large number of objects that can be related to horse harness (Lampe 1982). Aside from two terret fittings, there are 54 phalerae and a number of other bridle and harness ornaments (Lampe 1982). Further to these are four cheek pieces of antler and seven of bronze: The latter are, though, of two different types (Lampe 1982, pp. 38–40). The number of cheek pieces suggests that parts of three sets of bridles for two-horse teams are included in the hoard. The 13 sets of jingle plates give a more mixed expression, as there appear to be four different sets represented, but these are also incomplete, as shown by their odd number. Judging from the number of sets of jingle plates seen in other hoards, four sets appear to be the norm. This is true of the Fogdarp, Eskelhem, Stolzenburg and probably also the Pyritz hoards, where one set is incomplete (von Brunn 1981, Tafel 49). There are other hoards that give no definite indications of a two-horse team, for example Alt Ristow, Kallies and Schwachenwalde, or where only three sets of jingle plates are present, for example Klein Butzig, Rekau and Holsteinborg (Thrane 1975, p. 277; von Brunn 1981). It is apparent from the above that four sets of jingle plates per two-horse team, or two per horse, were apparently usual. The Bækkedal hoard, and perhaps also that from Ückeritz, is therefore atypical. As well as being evident from the Bækkedal hoard, the position of the jingle plates can be seen on a bit from Høve, which has a set of these plates at each end (Broholm 1953,

no. 216); this is further confirmed by the figure in the Svartarp hoard from Västergötland (Oldeberg 1939).

Remarkably, bits only feature very rarely in the many hoards containing horse harness. Apart from the Bækkedal hoard, bits have only been found together with cheek pieces on two occasions: in the Eskelhem hoard from Gotland, mentioned above, and in the Karbow hoard, which has bits with twisted mouthpieces (Sprockhoff 1956, p. 34, pl. 58). Bipartite bits of Høve type, with attached jingle plates, were found at Løvejergård on Orø in Roskilde Fjord. There were also bits in a hoard found in eastern Jutland (uncertain find spot) and two examples in an urn burial dating from period VI or the very beginning of the Iron Age at Annelöv in Scania (Varberg 2013, 149). The interesting aspect here is the general absence of bits from hoards that otherwise contain large quantities of horse harness components, together with the very diverse and non-standardised appearance of those bits that are present. One explanation could be that many of the bits were made of organic material, as was the case in the Bækkedal hoard: A horse's mouth has a toothless area, the bars, where a bit must be held for it not to be chewed to pieces. A find that appears to support the above conclusion with respect to non-metal bits is the hoard from Ückeritz, where leather remains not representing reins were found in the symmetrical cheek pieces (Lampe 1982, p. 28).

The position and attachment of the phalerae are also much-discussed subjects (Larsson 1974, pp. 211–215; Thrane 1975, p. 128). From later illustrations on for example the Gundestrup cauldron, it has been assumed that they formed part of the decoration of the bridle and harness (e.g. Brøndsted 1934, p. 165, 1958, p. 81). Based on the evidence from northern Germany and Pomerania, von Brunn remarks that the number of phalerae is often divisible by two and therefore reflects two-horse teams (von Brunn 1981, p. 116). Other studies show that phalerae of the same size are often represented by an even number (Larsson 1974, p. 214; Thrane 1975, p. 128). This is true in the case of the Bækkedal hoard, where four phalerae from the bridles have a diameter of 11–12 cm, while four others have a diameter of c. 15 cm. If the number of phalerae in other hoards is examined, a large group becomes evident in which there are only one or two

examples and where the horse harness consequently only constitutes a symbolic part of the overall hoard content. The situation is markedly different in the hoards where the harness present represents a two-horse team or teams (Table 2). In these cases there appears to be some form of standardisation in the number of phalerae, as most of these hoards contain between ten and 14 examples. This applies for example to the hoards from Eskelhem (12), Stolzenberg (12) and Karbow (14). In the Løvejergård hoard, where the absolute total is not known, there were about 11 phalerae. This picture is further reinforced when other hoards are considered: The hoards from Villingrød Mose and Hanemose, which contain no other artefact types, have 14 and 12 phalerae, respectively (Thrane 1983). In the north German and Pomeranian hoards from Morgenitz, Alt Ristow, Biesenbrow and Prausterkrug, the number of phalerae present is 10, 11, 12 and 14, respectively (von Brunn 1981, pp. 115–116). The hoard from Stevneskoven on Funen (Brøndsted 1934), which contains 23 phalerae together with a suspension vessel, is an exception in that factors other than the number of horses involved perhaps determined the items selected for offering.

A partial conclusion from the above is that, within the large geographic area corresponding to the Nordic Bronze Age sphere, there seem to have been established norms and conventions with respect to the appearance of bridles and harness for two-horse teams. The harness sets typically consisted of four cheek pieces with bits, four sets of jingle plates, two terret fittings and 10–14 phalerae. There are of course exceptions to this, not least in the case of the Bækkedal hoard, which contains eight sets of jingle plates, as well as more rarely occurring artefact types such as ornamental buttons and cross-ribbed cuffs. The individual sets of harness components show general similarities, but most of the hoards have some special features, bearing witness to the fact the bronze casters had the freedom, and the desire, to give their products an individual character. This is especially true of the jingle plates, which appear quite uniform at first glance but which, on closer examination, prove to vary considerably (e.g. Thrane 1975, Fig. 73; Lampe 1982, Tafel 28, Fig. 5). The form of the jingle plates and the shape of any perforations in them, as well as the composition of the individual sets, therefore often

differ and special regional characteristics are also evident. For example, hourglass-shaped jingle plates are only found in the southern Baltic area (Sprockhoff 1956, p. 259). A further example of variation is provided by the sets of terret fittings, which have the coiled tubes and, in part, triangular apertures on the reverse in common, while their decoration and upper termination differ (e.g. Larsson 1974, pp. 188–192). The most pronounced example of the latter is provided by the terret fittings from Fogdarp, which terminate in human heads, while other examples have either a moulded or cylindrical tube uppermost or a peg in the form of the head of a vase-headed pin surrounded by a ring. Bits and cheek pieces also vary greatly in form in period V, showing that bronze craftsmen continued to experiment and develop the various types.

The form and quantity of the bronzes making up the individual sets shows that these must have been associated with equally superior vehicles. Rougher four-wheeled carts, probably drawn by both oxen and horses, would have been used, as clearly shown by finds of disc wheels dated to the Early Bronze Age (Pare 1992, p. 42; Johannsen 2010, p. 156). However, Denmark also has several hoards containing wagon components that demonstrate the existence of vehicles of a completely different calibre, i.e. low-slung, metal-furnished ceremonial wagons (Schovsbo 2010, p. 18). The best known of these is the hoard from Egemose in southwest Funen, where c. 7 kg of bronze, in the form of c. 1000 rivets and various decorative fittings, was deposited in a pot in a bog (Jacob-Friesen 1969, pp. 125–130). Included in these were several bronze horned fittings and the well-known zoomorphic protoma, which all formed part of the wagon's furniture. These objects, which reveal that the vehicle had been burnt, represent the fittings from a wagon body and a pole. The wagon is thought to have been made in central Europe, perhaps in Switzerland, and, interestingly, parts of bridles are also symbolically represented in the form of two cheek pieces of types that are similarly thought to have been manufactured within the southwestern Urnfield culture (Thrane 1975, p. 122). There is therefore a great deal to suggest that an entire wagon, complete with equipment and perhaps horses, was imported to southwest Funen (Jacob-Friesen 1969, p. 155).

Another hoard, which turned up as early as 1817 at Skjerne on Falster, comprises only three objects: A horned animal figure with jingle plates, a conical bronze tube and an axle cap, which leaves its interpretation in no doubt (Jacob-Friesen 1969, p. 125). Both the Skjerne and Egemose hoards therefore belong to a small exclusive group of hoards containing wagon furnishings that have a particular association with the western Swiss lake site villages (Pare 1992, p. 28). The cremation grave in the barrow Lusehøj, dated to period V, also contained rivets of the same kind as those found in the Egemose hoard (Thrane 1984, p. 143). Thrane concludes that parts of a central European wagon, in the form of a wagon body or wagon seat, were placed on the deceased's funeral pyre together with rich grave furnishings. Given that Egemose lies only 6 km away from Lusehøj, it is suggested that the two finds perhaps represent the same wagon. A fragment of a possible cheek piece with ribbed ornamentation is also present in the Lusehøj burial, as are fragments of cross-ribbed bronze cuffs (Thrane 1984, p. 142), which are possibly associated with the bridles.

Rock carvings apparently depicting the vehicles that existed in the Bronze Age and Pre-Roman Iron Age are another important source of information (Johannsen 2010, p. 181). This is due to their very realistic execution and the fact that wagon components have been found elsewhere in Europe which correspond to those shown in the carvings. Two-wheeled chariots are the most commonly depicted vehicles and these are thought to date broadly to the Bronze Age (Johannsen 2010, p. 178). The image of the chariot from the Kivik grave, the only well-dated example of this type from Scandinavia, is however dated to the transition between periods II and III (Randsborg 1993, p. 133). If we compare this image with illustrations from Egypt and Greece, where this type of vehicle appears to have a similar or earlier date, the indication is that, in a Scandinavian context, these chariots date from the Early Bronze Age (e.g. Pare 1989, p. 81; Crouwel 2004; Randsborg, 2010, p. 251). A few finds confirm that people in Denmark have used horses as draught animals since the beginning of the Bronze Age or perhaps even the end of the Late Neolithic (Randsborg 2010). The most famous find in this respect is the Sun Chariot from Trundholm Mose

or ‘The Chariot of the Sun’, dated to period II of the Bronze Age, which depicts a hoarse pulling the sun (Aner and Kersten 1976, no. 867). Both the horse and the sun in the shape of a bronze disc are placed on a wagon frame. On the horse there is the suggestion of a very simple bridle and holes where the bit has been. The Sun Chariot shows that four-spoked wheels, wagon constructions and the use of horses as draught animals were all known in the Early Bronze Age. Another type of bridle is depicted on a razor from Daugård, which similarly dates from the Early Bronze Age (Varberg 2009, p. 24): In this case, two straps cross the bridge of the horse’s nose; this form of bridle is still in use today. Finally, mention should be made of the two antler cheek pieces from Østrup Bymark on Zealand. These date from period II and probably originate from central or southeastern Europe (Hüttel 1981, p. 103; Thrane 1999, p. 12).

Four-wheeled wagons with four-spoked wheels also feature in rock art and wheels of this particular type have actually been found at Stade, west of Hamburg (Jacob-Friesen 1927). The four bronze wheels were each cast in one piece, but with a hollow rim in which wood could be inlaid. They measure c. 57 cm in diameter. The wheels have been radiocarbon dated to period V (Deichmüller 1974). If the Stade wheels were the type generally used for ceremonial wagons at the end of the Late Bronze Age, as suggested by other finds, this indicates that the wagons were relatively low-slung with small, but richly furnished wagon bodies (Pare 1989, p. 80, 1992, pp. 28–30). An indication of the richness of the decoration on these wagons, and their appearance, is provided by the contents of the Egemose hoard, and also by the Dejbjerg wagons from the Pre-Roman and Roman Iron Age (Schovsbo 2010). These wagons were not built for speed but to serve other purposes. Pare concludes that these were ceremonial vehicles which, due to their small wagon bodies, were not suited to the transport of large, heavy things (Pare 1989, p. 80). He suggests that they were used in connection with ritual processions, funerals and religious ceremonies. Wagons of this type, which have roots at the beginning of the Urnfield culture when they were involved in funerals, appear to have played a role over a c. 800 year period that extended up into Hallstatt times, when there are also records of wagon burials (Pare 1989, p. 82). In Scandinavia and along the German-Polish Baltic coast, the numerous hoards containing elements of horse harness that probably derive from two-horse teams, show

that four-wheeled ceremonial wagons were more common than the few preserved wagon components might suggest.

The Bækkedal hoard was, as outlined above, found on a small sandy hillock and this raises a number of questions about the actual deposition itself: Why and how did this take place? Was the deposition site in impenetrable forest, on cultivated land or in some other kind of landscape? The fact that the reins, bridles and perhaps other parts of the harness were deposited in the pot, together with all the metal objects, adds a new dimension to the interpretation of hoards deposited on dry land. The Bækkedal hoard can therefore not be perceived as buried treasure, a scrap-metal hoard or trader’s goods (e.g. Levy 1981, pp. 17–25), but shows that there were also sacred places on dry land and that many terrestrial hoards must be equated with those deposited in wetlands.

Notes

1. Orthophotos from the following years were examined: 1954, 1975, 1979, 1982, 1985–1987, 1992, 1999, 2002, 2004, 2006, 2008, 2010–2012 and 2014.
2. Analysis of this material, which could be horn, is presently being undertaken by Enrico Appellini and Ulla Mannering, National Museum of Denmark.
3. The base was, however, domed such that the diameter was somewhat less.
4. Hoards only containing possible wagon components are not included in this statistic. Conversely, hoards are defined as containing horse harness that includes one or more of the following artefact types: Cheek pieces, bits, phalerae/decorative discs and jingle plates.

Acknowledgements

Thanks to conservator Lone Billeschou Juhl, Bevaringscenter Nordjylland, for extensive help in examining the finds and refitting the objects. Thanks also to museum curator Niels Haue PhD, The Historical Museum of Northern Jutland, for proof reading and commenting on the Danish manuscript. Further thanks to David Earle Robinson for translating the original Danish manuscript into English.

Funding

Special thanks to Dronning Margrethe II’s Arkæologiske Fond for funding the translation of the manuscript and drawing of the artefacts.

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