The Prittlewell princely burial

Excavations at Priory Crescent, Southend-on-Sea, Essex, 2003

Lyn Blackmore, Ian Blair, Sue Hirst and Christopher Scull

Dress fittings

Gold belt buckle

<S 14> Gold belt buckle (Fig 85; Fig 102; Fig 00; Fig 256)
<14>, [168]; period 4, S1
In middle of coffin area with tongue to south.
Complete buckle with triangular buckle plate. Wt 47.83g. Total L 73mm; L of buckle plate 47mm; max Diam of loop 30mm.
Circular-sectioned oval loop with slight groove for tip of tongue, attached to buckle plate by a separate double-thickness sheet-metal hinge-strap with the wider, upper sheet folded under at the outer edges [to check] and with a narrow flange soldered to the edge of the buckle plate. Circular-section tongue with flattened mushroom-shaped tongue base, pivoting on the buckle loop by means of a rectangular-section U-shaped loop soldered to the underside of the tongue base, join reinforced by ?two irregular piece(s) of sheet metal soldered to the underside and slit and lapped up around the base of the loop [to check]. Lobed triangular hollow buckle plate made from sheet metal with slightly thicker sheet metal walls comprising six (or ?seven) sections neatly soldered together and to top plate. Three dome-headed rivets on washers with applied ribbed wire collars attach the plate to the strap (missing) and a shorter triangular sheet metal back plate with rounded corners.
The buckle is in excellent condition with all parts moving; extensive fine surface scratches, mostly in blocks of parallel lines, were probably made during the manufacturing process; some small nicks to tongue and tongue-base, and slight dents to domed studs; hinge-strap slightly undulating, especially on back.
XRF analysis (DH): below, 10.7.
Fig 257 The gold belt buckle <S 14> (scale 1:1)

Garter buckles

Two buckles, <S 15> and <S 16>, were recovered from the east end of the coffin space; these were lifted in a soil block. X-radiography prior to excavation in the laboratory shows the ghosts of the buckle plates and counter-plates, but these fittings had largely disintegrated and are now represented by the surviving rivets and fragments of sheet metal from the plates only; comments are thus based partly on the X-radiograph (Fig 104).
<S 15> Copper-alloy buckle and buckle plate (Fig 257; Fig 104; Fig)
<16>a, [168]; period 4, S1
Found 69mm to north-east of <S 16>, *c* 200mm in from east end of coffin.
Complete narrow cast D-shaped loop with rounded cross-section and recessed axis bar for attachment of buckle plate and tongue; only base of latter survives. Loop: max W 18mm; L 9mm; Diam 2.7–3mm; Diam axis bar 2mm. Dimensions of the ?square sheet buckle plate uncertain; largest surviving fragment 12 x 7mm, Th 0.5mm; X-radiograph suggests L 9+mm, W 14–15mm. A row of three rivets (<16> iv–vi), presumed to be from the inner edge, are shown on the X-radiograph to the north-east (left on Fig 104) of the loop (two probably *in situ* on the plate, one displaced); all incomplete, fragments only surviving. Rivet iv: head missing; surviving shank L 1mm, Diam 1.5; flat slightly expanded terminal 1.8 x 2mm. Rivet v: head missing, vestige of plate present; surviving

shank L 1.7mm, Diam 1.6mm; terminal missing. Rivet vi: slightly expanded flat head (or ?terminal) Diam 2mm, with vestige of plate; surviving shank L 1.3mm, Diam 1.5mm.
Sample {EC1}: Black flecks associated with buckle exhibit no skin/leather structure; unidentifiable.
Fig 258 Copper-alloy garter buckles and counter-plates <S 15> and <S 16> (scale 1:1)
Copper-alloy counter-plate (Fig 257; Fig 104; Fig)
<16>b, [168]; period 4, S1
Found *c* 9mm to the south (right on Fig 104) of loop <16>a.
Rectangular sheet metal counter-plate with a row of three solid copper-alloy rivets *c* 2mm apart across each end. Those on the inner end survive (<16> i–iii); those on the outer edge are not visible on the X-radiograph but indicated by holes at the north-west corner and centre of the plate, the latter torn through to the north-east corner. Plate W 14mm; L 17mm; vestiges of top and bottom plate on rivets only (below), Th *c* 0.5mm. Rivet i: complete, L 3.8mm; expanded flat head 2 x 2.2mm, with vestige of plate below head; shank Diam 1.5mm; slightly expanded, angled ?hammered terminal, Diam 1.9mm, with vestige of plate on inside. Rivet ii: terminal missing, surviving L 3.5mm; slightly convex angled head Diam 2.2mm, with vestige of plate below head; shank Diam 1.5mm. Rivet iii: complete, in two fragments, max L 4.3mm; head 2 x 2.2mm with vestige of plate below; shank Diam 1.5mm; slightly expanded, angled ?hammered terminal Diam 1.8mm. Fragment of ?additional rivet with iii: surviving L 2mm; head missing; shank Diam 1.5mm; worn, flat, slightly expanded terminal, Diam 1.6mm, with vestige of plate above.

<S 16> Copper-alloy buckle and buckle plate (Fig 257; Fig 104)
<17>a, [168]; period 4, S1
Found 69mm to south of <16>, *c* 20mm in from east end of coffin.
Complete narrow D-shaped cast loop, with rounded cross-section and recessed axis bar. Cast tapering tongue is complete but for the tip, with flat underside, straight sides and slightly rounded upper surface with central transverse groove across the raised rectangular platform at the base; tongue L 12mm. Total L of loop and buckle plate 20mm. Plate ext W 18mm; L 9mm; Diam loop 2.5–3mm; Diam axis bar 1.5mm. Remains of folded sheet metal buckle plate around the axis, with slot for the tongue. Buckle plate: W 14–15mm; L 10mm; Th 0.5mm. Two of three original solid rivets from outer edge of plate survive, one, <17> i, from the south-west corner, the other, <17> ii, central but displaced and lying obliquely. Rivet i: incomplete, L 2.6mm; head missing but vestige of plate present; Diam shank 1.4–1.6mm, tapering towards terminal; flat terminal Diam 1.4mm. Rivet ii: incomplete shank fragment L 1.7mm, Diam 1.6mm; head missing, uncertain if terminal present or not.

?Copper-alloy counter-plate
<17>b [168]; period 4, S1 (Fig 257; Fig 104)
Found *c* 9mm to the north (left on Fig 104) of <17>a
Rectangular sheet counter-plate with originally three copper-alloy rivets at each end. X-radiograph suggests plate L *c* 18mm; W *c* 13mm. Only two rivets show on the X-radiograph with tiny fragments only surviving: at the south-west corner (<17> iv), and the centre of the northern/inner end (<17> iii). Rivet iii: incomplete, head end only; L 1mm; head 2 x 2.2mm; shank Diam 1.5mm. Rivet iv: incomplete, head end only; L 1mm; head 2 x 1.4mm; shank Diam 1.5mm.

Gold-foil crosses

The gold crosses were found *c* 30mm apart at the head end of the coffin; they may have been placed directly on the face, most probably over the eyes, or on a veil (Fig 84; Fig 85). Cross <S 17> was found with the plain side facing upwards, and the same was almost certainly the case for <S 18>, although its original position had been altered and it was found inverted and partially folded over on its side.

<S 17> Gold cross (Fig 85; Fig 110; Fig 258)

<11> [168] ; period 4, S1

Complete Latin cross of thin gold sheet, with faint incised guideline slightly in from the unfinished, unevenly cut edges; L 27mm, max W 16.6mm, Th 0.2mm. Straight-sided upright with squared terminal (L *c* 15mm, W 4.8mm), three expanding arms with irregularly cut concave sides and convex terminals (L of side arms *c* 6mm, max W 8.9mm; L of central arm 7mm, W 10.2mm). One side of central arm bent inwards. Weight 0.38g.

Fig 259 Gold-foil crosses <S 17> and <S 18> (scale 1:1)

<S 18> Gold cross (Fig 85; Fig 110; Fig 258)

<12> [168] ; period 4, S1

As above, crumpled, with faint incised guideline slightly in from the unfinished unevenly cut edges; L 27mm, max W 16.6mm, Th 0.2mm. Straight-sided upright with squared terminal (projected L 16mm, W 4.8mm), three expanding arms with concave sides and convex terminals (L of side arms probably *c* 6mm, W 9mm and 10mm; L of central arm *c* 7mm, W 11.5mm). Weight 0.32g.

As found this cross was flipped over and inverted, probably as a result of the collapse of the coffin causing it to jump and land on its side with the scored side facing inwards. The vertical is bent in three places and has an undulating profile, with an oblique fold at the intersection of the arms, all of which are bent forwards; the left arm was then bent outwards towards the terminal, while the outer corners of the central arm are now angled inwards.

Gold braid

<S 19> Gold braid (Fig 106; Fig 108)

<10>, [168]; period 4, S1

Found in coffin at area of neck

Incomplete; L 150mm, W 100mm, Th. 20mm

Lifted as a block

Two overlapping lengths of *c* 44 separate but associated fragments; combined L *c* 245mm (145 + 70 + 30mm). A further 84 fragments were recovered from a soil sample taken from under the coffin lid and above the upper body area of the deceased, that is, in the general area above the soil block (Fig 259). description of individual threads ???

Fig 260 X-radiograph of loose thread from gold braid <S 19> (scale 1:??)

Coins

<S 20> Gold coin (Fig 85; Fig 116)

<13>, [168]; period 4, S1
Inside coffin, in ?chest area.
Merovingian gold tremissis, mint-and-moneyer type, Ioannes of Cadolidi or Capolidi.
Obv CAD[OLI]DI
Rev +I[O]__NES
Diam 11 x 12mm; Wt 1.23g
Gold content 92.3% XRF (89.44–93.35% SG)
<S 21> Gold coin (Fig 85; Fig 116)
<15>, [168]; period 4, S1
Inside coffin in area ?right upper leg.
Merovingian gold tremissis, mint-and-moneyer type, Vitalis of Paris.
Obv [PA]RISVS FIT
Rev VITA___ MON-
Diam 10 x 10.5mm; Wt 1.26g
Gold content 91.3% XRF (84.98–90.21% SG).

Box and contents
The probable wooden box, <S 22>, with its contents, <S 23>–<S 29>, found in the south-west corner of the burial chamber was identified on site as a roughly rectangular area of dark organic staining <142> (L *c* 280–340mm; W *c* 220mm; H >50mm; Fig 101), with silver corrosion and small metal elements visible. It was block-lifted and the soil block X-rayed, drawn, photographed and excavated in the laboratory, where it was found to contain a bone comb, a copper-alloy cylindrical container, a silver spoon and an iron firesteel and knife, as well as mineralised wood.

Wood from the box
On excavation in the laboratory three different areas of mineral-preserved wood were identified. Two, found above and below the spoon and cylindrical container, are thought to derive from the box itself, and are described below, while a third, <S 27>, is described with the firesteel <S 26> which preserved it.

<S 22> Remains of wooden box (Fig 117)
<178>, [170]; period 4, S1
Dark brown substance above the spoon handle and its finial, <S 25> and partly over cylindrical container <S 24>; main grain direction aligned S–N with spoon axis; identified as wood {EC24}, {EC26}; and {EC27} from over spoon terminal; identified as mineral-preserved wood of *Acer* sp (maple) {JW16}. Thought to derive from the base of the box. It is uncertain whether this is one or two pieces of wood as in some places wood layers appear to be running in different directions which can occur in softwood as the wood decays with peeling off and layering of the peeled-off areas; alternatively in other areas there might be two pieces of wood with the S–N grain on the underside and a second piece over it with grain E–W (KS/EB).
Textile below <178>, over <S 25> (see <S 29>, below).
<142>a–c, [170]; period 4, S1 (Fig 119; Fig 260)
Fragment <142>a beneath <S 24> and <142>b–c beneath <S 25>

Two opposed pieces of wood with straight edges aligned parallel; outer faces (underside as found) painted, possibly forming part of the lid and side of lid of box. Fragment <142>a (extant L 82mm, W 38mm, Th 6mm), with a straight cut edge (KS) on the long eastern side. It has a N–S indented area on the upper side (as found), in which the remains of <S 24> lie, with part of S-shaped link <71>a embedded in wood. On the under surface as found <142>a has a ladder border painted in bright yellow (W 4.5mm) set *c* 5mm in from the straight edge with square to rectangular cells (L 3mm, W 2.5mm). Inside this are two oval areas with traces of decoration, the better preserved with an interlace pattern in bright red (extant L 27mm, W 9mm); the other has faint traces in white. Smaller joining pieces <142>b–c (total L 58mm, W 30mm) have a straight (probably cut) edge along the west side, parallel to the cut edge on <142>a. On the underside there is a ?ladder border in bright yellow (W 9mm) set 7mm in from the straight edge. The red and white pigments appear to be applied to a ?polished surface, the yellow into recessed channels (EC).
Pigments (JA): Raman spectroscopy shows wood painted with earth pigments (red and yellow) and gypsum (white) (below, 10.4).
Wood (JW): mineralised wood identified as *Acer* sp (maple), {JW15}, {JW18}.
Mineral preserved wood (EC): small lens pale-coloured material beneath outline of <S 24> on <142>a confirmed as wood, {EC29}.
Mineral preserved organic (EC): white flock-like material overlying pigment identified as mixture plant fibres and funghal mycelia, {EC45}, and ?funghal {EC46}.
Fig 261 Painted wood fragment <142>a from lid of box <S 22> (scale 1:??)

Cylindrical container
<S 24> Copper-alloy cylindrical container and lid with composite chain (Fig 120; Fig 121; Fig 122a; Fig 261; Fig 262)
<71> [170]; period 4, S1
In north-east part of box complex <S 22>
Cylinder, ? originally whole, now crushed and incomplete (description bassed on 20 fragments). Formed of sheet metal, L *c* 45mm (from position of ends within wood <142>a), Diam rim 25mm, Th 0.5mm. Upper body (six joining fragments) has a band of incised chevron decoration below paired horizontal lines *c* 12–3mm below rim (H *c* 10mm). Lower body: five lower edge fragment, one with side seam edge as well; five body fragments, some joining. Band of incised oblique lines around base (H 5–mm), separated by paired horizontal lines from a band of incised chevrons below single horizontal lines (H *c* 7mm); some oblique lines continue over the body toward the side seam (extent unknown). Slight horizontal line and thickening in two places on inside of one lower wall fragment suggests probable position of ?soldered basal disc, from which two tiny fragments may derive. Lid disc (extant Diam 24mm; Th 0.7mm) with some wear and damage around edge has T-sectioned rim (Th 1mm) for attaching straight-sided wall represented by two fragments (probably undecorated; H 19mm). Incised decoration of 11 lines on top, radiating from a central perforation housing a wire attachment loop (W 2mm; Th 1mm), the ends splayed outwards on inside of lid. Patches of a thin light brown layer in places on the inner surface of the cylinder fragments were sampled for FTIR analysis (below).
Chain and ring now incomplete, comprising at least four large S-shaped links (a)–(d) (L 16–8mm, W *c* 6m, Diam of wire *c* 1.5mm), with one straight and one pinched end. Links (a) and (b) complete on X-ray, now incomplete; links (c) and (d) complete. Link (a) probably included a figure-of-eight-shaped loop of iron wire (not extant, from X-ray), possibly with an extra loop at the northern end (extant L *c* 18mm, max W 8mm, Diam of wire 2–3mm), broken at the southern end; the northern loop engages with a copper-alloy ring (ext Diam 18mm), part *in situ* (L 7mm), part loose (extant L 13mm; Diam of wire 2mm). Parts of links (a) and (d) embedded in wood <142>a.
XRF analysis (HW): 10.9, below.

Brown residue (AM, PG): appears to be cellulose and inorganic material; not identifiable and not necessarily representing contents of <S 24>; could be plant material, soil and corrosion product from burial environment (FTIR analysis, Chapter 00).
Mineral preserved wood (EC): small lens pale-coloured material beneath outline of cylinder confirmed as wood, {EC29}; ? relates to wood <142>a.
Painted wood <142>a (above/below), adhering to underside of <S 24>.
Fig 263 Detail of chain links of cylindrical container <S 24> over wood <142>a in situ *in the soil block*
Copper-alloy rivet (Fig 00, drawing)
<180>, [170]; period 4, S1

In north-east part box complex <S 22>, near container <S 24> and possibly originally associated with ring on chain fitting <71>a.
Near complete; extant L 4mm, Diam head 2mm. Dome-headed pin or rivet with slightly tapering, faceted square shank with more or less straight terminal (W at top 1.5mm, W at base 1mm); it is unclear whether the slightly angled lower end is original or broken, but there is no evidence of a washer.

Silver spoon
<S 25> Silver spoon (Fig 120; Fig 124; Fig 125; Fig 261)
<32>, [170]; period 4, S1
Along east edge of box complex <S 22>, bowl to south.
Total L 245mm; W of bowl 34mm, L of bowl 72mm; Wt 37.38g. Made from a single piece of metal. Incomplete shallow bowl of slender almond-leaf shape, reassembled from a number of fragments, canted slightly upwards and joined to the handle by a disc (W 15mm, Th 2mm) set vertically between the two, with rat-tail for *c* 50% of the underside of the bowl. Reasonably complete handle, rectangular in section at the disc (3 x 4mm), but tapers to round section (Diam *c* 4mm) with nine transverse ring mouldings; terminates in a baluster-moulded finial. Graffiti on the inner surface of bowl comprise a cross and three rows of letters. XRF analysis shows 95% silver (Chapter 00). Mineral-preserved wood over handle (above, <178> box complex wood).

Firesteel and wooden? disc/lid
<S 26> Iron firesteel (Fig 00; Fig 261)
<76> [170]; period 4, S1
In south central area of box complex <S 22>, over wooden ?lid <S 27>
Complete, but in two pieces; total L 59.4mm, L as reconstructed 57mm; max W 17mm, Th 5mm (in corrosion). Humped or sub-triangular body with rounded, possibly spirally recurved terminals (L 8mm, W 10mm); lower edge slightly curved. X-radiograph shows presence of an oval wire suspension ring with overlapping ends attached in ?slipknot form (Diam *c* 25mm, Diam of wire 2mm). No clear perforation to attach ring visible at apex on X-radiograph but could have been on line of break.
Wood (JW): wooden ?disc <S 27> preserved against the underside of <S 26> (below).
<S 27> Wooden disc/lid (Fig 132; Fig 261)
<179> [170]; period 4, S1
South-west corner of the chamber, in box complex <S 22> and adhering to underside of strike-a-light <S 26> (as found)
Incomplete; extant L *c* 58mm, W 37mm, Th *c* 6mm; Diam *c* 75mm. Fragment of curved wooden ?disc or lid with ?turned relief and incised decoration on under side as found comprising a border of three raised concentric rings with inverted V-shaped section (W *c* 1.5mm; combined W 6mm) and a ?single raised band *c* 10mm in from the outer border. Flat upper side as found, decorated side possibly originally slightly convex. Wood identified as *Betula sp* (birch); {JW17}, SEM JW6.

Knife
<S 28> Iron knife (Fig 261)

<77>a–e/<162> [170]; period 4, S1
In west central part of box complex <S 22>, ?originally along west edge of box parallel to spoon <S 25>
Incomplete, in six pieces, tip of blade missing; min L 172mm. Five pieces, <77>a–e, found corroded together: two joining blade fragments <77>a–b (L 55mm, W 18–20mm), with two joining tang/handle fragments <77>c–d adhering to the surface at one end (L 44mm, W *c* 11mm). Blade fragment <77>e (L45mm, W 18–9mm) lay obliquely across <77>a, with one end under <77>b and c. The loose fragment, <162>, found at a higher level, comprises the junction of the blade and the tang (L 31mm, W 19–20mm) and probably joined with <77>a. Fragments <77>b and <77>e probably joined but no longer do so conclusively; <77>c–d are now separate from <77>a–b. The cross-section of the blade now 'shows a hollow core, as if an iron strip has been folded over and the two edges joined, to create a wedge-shaped exterior but the X-radiograph shows a relatively uniform density across the "blade" ' (Starley 2013).

Vessels on the wall
Hanging bowl
<S 30> Bronze hanging bowl with enamel, tin, tin-lead solder (Fig 263; Fig 133–Fig 136)
<1>, [248]; period 4, S1
On the wall of the north side of the chamber, attached by iron hook <S 1>
Near complete; Diam at rim 210mm; H 85mm. Raised bowl with separate rim made of curved sections of bronze (W 4.5mm, Th 5mm) soldered to the edge, some sections now missing. Additional disc of sheet bronze under the base. Internal and external cast basal discs with zoomorphic decoration and separate notched frames (Diam 28mm). The outer disc sits within a base ring with cast herringbone decoration (ext Diam 94.7mm) below four vertical ribs with cast geometric decoration (W 11–11.9mm). The ribs sit between applied notched strips (ext W 19–19.4mm). Four cast hooked mounts (H 33mm) with enamel decorated circular plates (W 23– 24mm) within circular notched frames; four suspension rings, circular in section (Diam *c* 17mm), one damaged. Capacity *c* 1.900ml.
Textile (EB): six tiny fragments of gold thread <191> were found among a small sample of copper corrosion from one of the vertical applied notched strips on the outside of <S 30>. They consist of a z-spun gold ribbon probably originally wound around an organic thread core. Max L *c* 5mm, min L *c* 2.5mm; wound thread *c* 0.1mm wide. Fragments very soft and flexible with some areas misshapen or torn and others where ribbon is still tightly wound. Longer fragments have some sharp angles but not clear if this is an original feature or due to post-burial distortion. Similar dimensions, appearance and wound structure suggest all are related or even all part of the same original gold thread.
Fig 264 Side view of copper-alloy hanging bowl <S 30> with drawing of the bands, hooks and basal disc (scale 1:??)

East Mediterranean flagon
<S 31> Copper-alloy flagon (Fig 89; Fig 141; Fig 142; Fig 143; Fig 264)
<2> [248]; period 4, S1
At approximate centre of north wall

Complete 6th- to early 7th-century AD East Mediterranean flagon, H 219mm, max Diam 132.6mm; weight 1253.43gm; capacity 1.13 litres. Hammered copper-alloy container with round mouth, chained lid. The broad flagon body has a rounded base with recessed centre (Diam 32.5mm) covered with rows of neatly executed sub-rectangular hammer marks (H 5.8mm), carinated shoulder (W 40mm) decorated with an incised herringbone pattern, shallow fillet (width 7mm) around the base of the cylindrical neck (H 88.2mm). The separately cast copper alloy handle (max H 190mm), looped at the top and vertical below, has a leaf-shaped base (height 42mm) that was soldered to the flagon body. Above, the handle is secured by two loose metal overlapping bands around the neck, the inner one plain and originally held by a rivet passing through a perforation in the upper end of the handle. The outer band is composed at the front by three joined discs (height 33–33.5mm) with figural decoration within a beaded border (Diam 20mm) which terminate behind in two wires that extend to, and are each wrapped three times around the vertical part of the handle to a height of 20mm. A chain of five S-shaped links is secured by a cotter pin to the interior of the stepped lid (H 39mm) and attached at the other end to an upright spatulate thumbpiece (H 28mm) inserted into the top of the handle). XRF analysis (Chapter 10.9) reveals that the body is of copper with minor amounts of lead and tin, while the handle, chain and medallion band are of leaded gunmetal or an impure brass. A tin-rich solder was noted on the underside of the lower handle tab. pXRF analysis of the lid was attempted but, due to the disrupted corroded surface, useful result data were not forthcoming.
Wood (KS): Multiple fragments of wood identified as Quercus sp (oak) appear to lie horizontally along under flagon and thus horizontally to floor of chamber.
Fig 265 East Mediterranean copper-alloy flagon <S 31> (scale 1:2)

Drinking vessel array
Glass vessels
<S 35> Blue glass beaker (Fig 154; Fig 268)
<33> [246]; period 4, S1
On floor on east side of chamber S1, at northern end of row
Squat, slightly irregular globular beaker, broken but complete; H *c* 80–3mm, max Diam *c* 125mm (excluding trails), Th *c* 2–3mm, Wt 328+g. The slightly thickened round-topped rim (ext Diam 74–6mm, Th *c* 5mm) flows into the upright, slightly concave neck. The base (Diam *c* 66mm) has a small oval dimple at the centre, pushed in with a rounded tool,

but no other trace of a punty. Three thick arcaded self-coloured trails on the body form a lattice pattern with 12 cells per row. A fourth trail was looped into the centre of the base to create seven lobes; this stands proud of the body but is worn as a result of use. In three cases the inner junction of the loops are neatly finished pads, but the others were apparently flattened too soon and have jagged surfaces. Glossy deep blue glass with occasional small bubbles; no obvious inclusions.
Fig 269 The two blue, <S 35> and <S 36>, and two green, <S 37> and <S 38>, glass beakers from the chamber (scale 1:2)

<S 36> Blue glass beaker (Fig 154; Fig 268)
<34> [246]; period 4, S1
On floor on east side of chamber S1, between <S 35> and <S 37>
Squat, slightly irregular globular beaker, broken but complete; H *c* 81–3mm, max Diam *c* 122mm (excluding trails), Th *c* 2–3mm, Wt 326+g. Slightly thickened round-topped rim (ext Diam 73–6mm, Th *c* 5mm) emphasised by a ridge at the junction with the upright, slightly concave neck. The base (Diam *c* 66m) has a small oval dimple at the centre, pushed in with a rounded tool, but no other trace of a punty. Three thick arcaded self-coloured trails on the body form a lattice pattern with 11 cells per row. A fourth trail was hooked into the centre of the base to create seven lobes. Although abraded, this mostly stands proud of the body but one area has been worn almost flat through use. The inner junction of the loops is flattened with a small tool, four neatly but in three cases with jagged surfaces. Glossy deep blue glass with occasional small bubbles; no obvious inclusions.

<S 37> Green glass beaker (Fig 155; Fig 268)
<35> [246]; period 4, S1
On floor on east side of chamber S1, between <S 36> and <S 38>
Squat sub-biconical form, broken but complete; H 62–4mm, max Diam *c* 75mm, Th ?*c* 1mm, Wt 73g). Slightly expanded fire-rounded rim (ext Diam *c* 45–7mm, Th *c* 4–6mm), concave neck, low carination and slightly kicked base (Diam 47mm) pushed in with a tool to create a small conical dimple. Self-coloured trial spiralling clockwise eight times around the neck and shoulder, overlain at five points by three of the five more or less equally-sized lobes created by neatly hooking a second trail in to the centre of the base where the junctions blur. There is a flaw at the upper edge of one of the basal lobes where a tool has become stuck to the trail and left a white bubbled scar. There is also a piece of excess glass on the underside of the base, which shows little sign of wear. Natural green glass with high gloss; few inclusions but numerous fine bubbles, mainly under 0.5mm but up to 2mm across.
Staining (EB): slight white ‘watermark’ on part of the inner wall (but with no surface residue), is consistent with a little ground-water having at one time collected in the beaker while on its side.

<S 38> Green glass beaker (Fig 155; Fig 268)
<36> [246]; period 4, S1
On floor on east side of chamber S1, between <S 37> and <S 43>
Squat sub-biconical form, broken but near complete; H 71–3mm, max Diam *c* 79mm, Th 1mm, Wt 85+g). Expanded fire-rounded rim (ext Diam *c* 45–7mm, Th 6–7mm) and slightly concave neck; rounded body with low carination. The slightly kicked base is

pushed in with a tool to create a small dimple. A self-coloured trail spiralling clockwise eight times around the neck and shoulder, is overlain by all of the five unequally sized basal lobes, which show little sign of wear. All spring from the centre but were applied individually, in four cases arching to the right, the other to the left. The largest contains two parallel threads of white glass for half its length. The inner ends of two lobes are flattened with a tool, as are the three other ends that return to the centre; the others stand proud. Natural green glass with high gloss; few inclusions but numerous fine bubbles, mainly under 0.5mm but up to 2mm across.

Drinking horns

<S 39> Composite drinking horn (Fig 156; Fig 269)

<49> [246]; period 4, S1

On floor by east wall of chamber, between drinking bottle <S 44> (to north) and drinking beakers <S 47> and <S 45> to south.

Complete gilded copper-alloy rim mounts and most of 12 pendent triangles, now compressed with flattened figure of eight outline (Diam *c* 100mm x *c* 52mm, 45mm at midpoint; extant H 78mm). The fittings are attached to the horn by convex-headed tapering pins, sometimes bent over on the inside, with the exception of the rim clips, E, where the top fixing where the inner side of the clip is secured through the horn and the outer side of the clip with convex-headed rivet with flattened terminal. Sequence of construction illustrated in Fig 00).

A: Broad horizontal band comprising three slightly trapezoidal panels with Style II decoration, one measurable (W *c* 71mm at top/69mm at base, H 30mm).

B: Complete rim binding with C-shaped section which covers rim of horn and top edge of A (original Diam 80mm, H *c* 5mm).

C: 12 pendent triangles with Style II decoration, five near complete (L 45mm+); each secured by three tapering pins near the outer corners and at the apex.

D: Narrow fluted strip (broad groove flanked by two narrow grooves between four ridges) covering junction of A and C (W 4mm), secured by tapering pins below and at midpoint between rim clips E (Diam of head 3mm).
E: Three identical, equally spaced rim clips with zoomorphic terminals and fluted tabs at the top (broad groove flanked by two narrow grooves between four ridges) which hook over the rim (ext L *c* 36mm, max W *c* 6mm; int L *c* 14mm, W 5mm); secured by a rivet at the top through the inside of the rim clip and at the bottom by a tapering pin.
Width at top = 6mm, width at bridle strap 5.5mm, width at base = 5mm. Thickness at top 5mm, at basal strap of bridle 4mm (?fraction less, at top of nose 3mm, at base of nose 3.5mm. The nose profile is slightly concave below the bridle strap, with paired incised lines defining the cheek-bar mouth bit.
Metal (HW): pXRF analysis showed fittings were gold over a copper substrate (10.9, below).
Plant remains (KS): grassy material cf Poaceae associated with metal fittings.
Mineralised organic (EC): identified as horn, preserved only where it is in contact with metal fittings. Area of extant horn measures *c* 100 x 90mm in plan, two layers crushed.
Fig 270 Composite drinking horns <S 39> and <S 40>drawings (scale 1:??)
Fig 00 Diagram showing sequence of construction of rim mounts to be done at post-referee edit

<S 40> Composite drinking horn (Fig 156; Fig 269)
<68> [246]; period 4, S1
On floor by east wall of chamber, adjacent to and north of <S 39> but below beaker <S 34>. Complete gilded copper-alloy rim mounts and most of 12 pendent triangles, badly compressed with flattened figure of eight outline (97mm x 45mm, 37mm at mid point; extant H 90mm). More damage to rim than on <S 39>. Horn survives behind the metal fittings.
A: Broad horizontal band comprising three slightly trapezoidal panels with Style II decoration, one measurable (W *c* 71mm at top/69mm at base, H 31mm).
B: Complete rim binding with C-shaped section (original Diam 80mm, H *c* 5.5mm).
C: 12 pendent triangles with Style II decoration, eight near complete (L c 45mm+), each secured by three dome-headed tapering pins *c* 8mm below D and at the apex.
D: Narrow fluted strip (broad groove flanked by two narrow grooves between four ridges) covering junction of A and C (W 4mm), secured by dome-headed tapering pins below and at midpoint between E (Diam of head 3mm).
E: Three identical, equally spaced zoomorphic mounts with fluted tabs at the top (broad groove flanked by two narrow grooves between four ridges) which hook over the rim (int L *c* 14mm, W 5mm), secured by a dome-headed rivet at the top and a tapering pin at the bottom (ext L *c* 36–7mm, max W *c* 6mm).
These zoomorphic mounts are much less clear than those on <S 39> due to concretions. They appear to be the same size but while one appears to have the same paired incised defining the cheek-bar mouth bit, another differs in having a central longitudinal groove, and a transverse one across the end.
Metal (HW): pXRF analysis showed fittings were gold over a copper substrate (10.9, below).

Mineralised organic (EC): identified as horn, preserved where it touches the metal fittings, an area measuring 95mm across the rim and 90mm L, two layers crushed {EC19}.
?Plant remains (KS): Non-Poaceae plant material, possibly *Schoenoplectus* sp on underside metal; possible weaving observed (very small fragment); also Poaceae from underside, ?flooring. Plant fragment from rim unidentifiable, fungal hyphae clearly visible.
Radiocarbon dates: samples from plant remains and horn dated (Chapter 6.6).

Drinking bottles and cups
The finds are listed in their groups by the north and east walls, working from west to east and from north to south. The coding of the components of the drinking vessel mounts is the same as that for the drinking horns (above), arranged in the probable order of application.
<S 41> Composite drinking bottle (Fig 161; Fig 270) x071
<44>, [246]; period 4, S1
By north-east end of coffin, just to north of twin <S 42> and to west of fitting <19> of coffin <S 12>. Incomplete; max Diam 59mm, extant H 66mm (including mineralised wood), Th 6mm. Represented by complete gilded rim mounts and upper part of wooden body
A: Three trapezoidal gilded panels with die-impressed Style II decoration within beaded border (H 20mm), W 49mm at top/55mm at base. Where the edge of the panel is visible it can be seen that they were designed to overlap, with a pin hole in the top corner that would have lined up with that in the overlying strip E.
B: Complete rim with C-shaped section, compressed and in two pieces (Diam *c* 59 x 57mm, W *c* 4mm), the butt end originally hidden by one of the clips (E, displaced). Slight wear, more obvious on one side than the other.
C: Nine large gilded pendent triangles with die-impressed Style II decoration within beaded border, total L 37.5mm, W across top *c* 24mm, secured by three dome-headed tapering pins, one at the apex, the others toward the wider end.
D: Fluted strip (one broad groove between two narrow ones, Diam 74.5 x 63mm, W *c* 4.5mm), secured by three equally spaced dome-headed tapering pins (Diam 3mm) between each of (E).
E: Three identical gilded silver rim clips (int L *c* 11mm, ext L 29mm, W *c* 5mm), with one broad groove between two narrow ones (W *c* 6mm) and each secured by a dome-headed rivet hammered flush with inside of clip at top below rim, and a tapering pins at the base hammed down at the tip (L 6.5mm, Diam head 2.5mm). Two near complete but damaged at the rim, one present on the inside only.
Metal (HW): pXRF analysis showed gilding on a silver substrate (10.9, below).
Wood (JW): Mineral-preserved wood identified as Acer sp (maple); TS, very obscured.
Plant remains (KS): soil associated with <S 41>, ? just chamber fill; roots, grass leaf, wood and charred cereal grain.
Fig 271 Composite drinking bottles <S 41> and <S 42> (scale 1:??)

<S 42> Composite drinking bottle (Fig 161; Fig 270) x071
<45>, [246]; period 4, S1

By north-east end of coffin, just to south of twin <S 41>.
Incomplete; Diam 60mm, extant H 68mm (including mineralised wood), Th 4mm. Represented by complete but slightly compressed gilded silver rim mounts and pendent triangles, and upper part of wooden body, the latter splayed outwards and distorted.
A: Three trapezoidal panels with die-impressed Style II decoration within beaded border (H 20mm), one measurable: W *c* 50mm at top/58mm at base.
B: Complete rim with C-shaped section, compressed and in two pieces (Diam *c* 60mm, W *c* 4.5mm), the butt end originally hidden by one of the clips (E, displaced). Slight wear, more obvious on one side than the other.
C: Nine large pendent triangles with die-impressed Style II decoration within beaded border, L 37.5mm, W 24mm, secured by three dome-headed pins, one at the apex, the others toward the wider end.
D: Fluted strip (one broad groove between two narrow ones, Diam uncertain due to distortion, W *c* 4.7mm), secured by three equally spaced dome-headed pins (Diam 3mm) between each of (E).
E: Three identical rim clips (int L 11mm, ext L 29mm, W *c* 6mm), with one broad groove between two narrow ones, each secured by a dome-headed rivet below the rim, and a tapering pin at the base (L 8mm, head Diam 3mm, shank Diam 2mm tapering to 1mm).
Metal (HW): pXRF analysis showed fittings were gold on a silver substrate (10.9, below).
Wood (JW): Mineral-preserved wood identified as cf Acer sp (cf maple); very degraded, very difficult to observe, TLS.
Plant remains (KS): soil from inside cup contained rootlets.
Fig 272 Composite drinking bottles <S 43> and <S 44> (scale 1:??)

<S 43> Composite drinking bottle (Fig 161; Fig 272) x003
<48>, [246]; period 4, S1
By east wall of chamber, between <S 38> (to north) and twin cup <S 44>.
Incomplete; max Diam 70mm, extant H 43–70mm (including mineralised wood), Th *c* 5mm). Represented by complete but compressed gilded copper alloy rim with mounts and upper part of wooden body, the latter splayed outwards.
A: Three trapezoidal panels with die-impressed Style II decoration within beaded border (H 20mm), two measurable: W 51mm at top/62mm at base; W 49mm at top/59mm at base.
B: Complete rim with C-shaped section, compressed and cracked into five lengths (original Diam *c* 55mm; W 5.5mm); extant L 78mm, W 32mm.
D: Fluted strip (three grooves between four ridges; Diam at base 65 x 70mm; W 4.5mm), secured by three dome-headed pins between each of (E) (Diam of head 3mm).
E: Three fluted clips (five grooves between six ridges) secured by rivets at top and pins at the bottom; int L *c* 14mm, ext L 30mm; W 7mm.
Metal (HW): pXRF analysis shows fittings are gold on a silver substrate with the exception of interlace panels A, which are gold on a copper-alloy substrate (10.9, below).
Wood (JW): Mineral-preserved wood identified as Acer sp (maple); burrwood.
Fig 273 Composite drinking cups <S 43> and <S 44. (scale 1:??)

<S 44> Composite drinking bottle (Fig 161; Fig 272) x006, x007
<37>, [246]; period 4, S1

By east wall of chamber, between twin bottle <S 43> (to north) and drinking horn <S 39>.
Incomplete; max 57mm; Diam 57mm, extant H *c* 55mm (including mineralised wood), Th 5–6.5mm). Represented by complete gilded rim mounts and upper part of wooden body, the latter splayed outwards.
A: Three trapezoidal panels with die-impressed Style II decoration within beaded border (H 18–20mm); visible areas: 50mm at top/58mm at base; 52mm top/61mm at base; 53mm top/63mm at base).
B: Complete rim with C-shaped section (Diam 56 x 57mm, W *c* 5mm).
D: Fluted strip (three grooves between four ridges), Diam 65 x 70mm; W 4mm), secured by three dome-headed pins between each of E (Diam of head 3mm).
E: Three fluted rim clips (five grooves between six ridges) possibly originally secured by silver rivets at top (but in one case this is a pin hammered over downwards – ? a repair) and at the bottom by tapering pins; two clips completely covering (D), one covering half (int L *c* 10–14mm, ext L 27mm, 30mm, W 6mm).
Metal (HW): as for <S 43> (10.9, below).
Wood from cup (JW): Mineral-preserved wood identified as Acer sp (maple); diffcult to observe, RLS, burrwood.
Wood from below <S 44>/<S 40> (KS): identified as Quercus sp (oak) from floor.

<S 46> Composite drinking cup (Fig 166; Fig 273) x071
<55>, [246]; period 4, S1
By east wall of chamber, to south of twin cup <S 45>.
Incomplete; max Diam 64mm, extant H 33mm (including mineralised wood), Th 2–3mm).
Represented by slightly oval rim with three equally spaced gilded mounts and upper part of wooden body.

B: Complete rim with C-shaped section (Diam *c* 63 x *c* 64mm, W *c* 5mm), the butt end hidden by one of the clips (E). Wear obscured by green patina but more obvious on one side than the other.
E: Three identical rim clips (int L 11mm, ext L 26mm), comprising upper fluted strip with five grooves between six ridges (W 8mm) and pendent Style II bird heads (L 12–13mm, W 13.5mm), more or less equally spaced and held in place by a rivet at the top below the rim, and a tapering pin through an eye at the base, the shanks of which are bent downwards (all *in situ*, Diam of head *c* 3mm). One intact, one near intact, one cracked.
Metal (HW): as for <S 45> above.
Wood (JW): Mineral-preserved wood identified as cf *Acer* sp (cf maple); TS difficult; burrwood.
<S 47> Composite drinking cup (Fig 274)
<50>, [246]; period 4, S1
By east wall of chamber, aligned west–east just to north-west of <S 45> and south of drinking horn <S 39> and bottle <S 44>.
Incomplete and badly crushed, now in two joining pieces; max L 48mm, W 18mm, extant Ht 23–7mm (including mineralised wood). Estimated original Diam *c* 37.5mm. Represented by remains of compressed tubular silver rim binding (Diam 4mm) with one of three tapering silver rim clips (two visible in X-radiograph), the outer side tapering (L 20mm, max W 6.5mm), the inner wider and squared (L 11mm, W *c* 7mm). Upper part of wooden body splayed outwards survives along one side but only on *c* 40% of the other.
Wood (JW): Mineral-preserved wood extremely degraded fragment; no cell structure discerned.
?Wood with soil from beneath <S 47> (KS): too degraded for identification.
Fig 275 Composite drinking cup <S 47>: X-radiograph and proposed reconstructed rim binding (scale 1:2)

Larger vessels on the floor

Buckets
<S 48> Wooden stave bucket with iron fittings (Fig 93; Fig 168; Fig 170; Fig 275)
<8>, [246]; period 4, S1
South-east corner of the chamber, against east wall, just to the south of the drinking vessels and north of <S 49>.
Complete but compressed and lop-sided; Diam at rim *c* 245mm, Diam at base *c* 283mm; extant H 210–40mm (excluding handle). Separate iron rim of inverted U-shape section (H 11.4mm) overlies broad flat top hoop (exposed W 52mm, total *c* 63mm). Middle (now slipped down) and bottom iron hoops both double D-shaped section (W 22mm; Th *c* 6mm). Iron bands and remains of wooden staves supported by consolidated soil so that the bucket shape remains almost intact.
Two opposed elongated pendent triangle handle mounts (a–b) overlie top hoop (point of (a) now hidden below middle hoop), with narrow extensions folded over rim to form loops for attachment of handle; slightly expanded, rounded terminals on exterior and on interior (one square-ended and one ?rounded) to accommodate rivets (total ext L *c* 165mm, max W (top) *c* 45mm; int L *c* 57mm, max W (bottom) 15mm). Rivets not visible

but probably had solid shanks and would have secured top of triangle on exterior to extension terminal on interior (through upper hoop and staves), with further rivet attaching bottom of triangle to wooden staves below top hoop. Two matching intermediate opposed pendent triangle rim clips (c–d, point of d now hidden below middle hoop) are folded over the rim with wider and shorter square-ended extension tabs (ext L *c* 148, max W *c* 45–50mm; int L 38/37mm, int W 18–19mm); attached by top rivet passing through top of triangle, upper hoop, staves and extension terminal, and lower rivet attaching point of triangle to staves below top hoop. Rivets difficult to see but all probably have solid shanks; where visible, the heads are convex, while the backs can be convex or flat. Iron swivel handle has twisted side sections and expanded ?U-section central grip (from X-radiographs), with terminals looped sideways through handle mounts.
Detached fragment of rim and top hoop of <S 49> corroded to rim and top hoop of <S 48>; also fragment of bottom hoop of <S 49> corroded to same area of <S 48>.
Wood (JW): sample of mineralised wooden staves identified as *Taxus* sp, yew; {JW6}, SEM JW1.
Further wood (JW): remains on the outside of hoops in places represents the oak (*Quercus* sp) upright planking of the chamber walls.
Textile (SH): {8 TF1} is a mineralised area on the inner face of an iron upright, 3 x 4mm, but with no visible structure. Some z spun threads are possibly present but there are no further recordable details. Other areas around the rim and on the outside of the iron components are also very deteriorated and there is a very low level certainty as to whether these were textiles, although presences in these locations might be expected. Uncertain.
Fig 276 Iron-bound wooden buckets <S 48> and <S 49> (scale 1:?4)

<S 49> Wooden stave bucket with iron fittings (Fig 93; Fig 169; Fig 170; Fig 275)
<9>, [246]; period 4, S1
South-east corner of the chamber, against east wall, just to the south of bucket <S 48>.
Iron bands and remains of wood staves held in position by soil in the ground, now disassembled, with sections of rim and top hoop, and base hoop, attached to <S 48>. Diam at rim *c* 235–40mm (incl corrosion), Diam at base estimated at *c* 285mm; H *c* 220+mm (estimated from position of top of rim attached to <S 48>). Iron rim of U-shaped section (H 10.5mm) overlies broad flat top hoop (exposed W 50–2mm). Middle and bottom hoops both double D-shaped section (W 20mm, Th *c* 6mm).
Two opposed elongated pendent triangle handle mounts (a, b) with slightly expanded rounded terminals overlie top hoop; the narrow extension tabs (one with slightly expanded rectangular terminal, the other tongue-shaped) are folded over rim to form loops (ext L *c* 174/172mm, max W *c* 47mm; int L *c* 53/57mm, max W 13.5–14.5mm). X-radiographs show rivets attaching top of triangles through hoop and staves to extension terminals on interior and further rivets attaching points of triangles to staves below top hoop. Two intermediate elongated triangular rim clips are folded over the rim with wider and shorter, square-ended extensions (ext L 152/150mm, W 43mm; int L 45/30mm, W 22/20mm), again attached by rivets through both ends of triangles. Iron swivel handle has twisted side sections (from X-radiograph) and expanded U-shaped central grip, with terminals looped sideways through handle mounts (H 16mm (as held); maxW *c* 17mm).

Plant remains (KS): a sample from the area of the base of <S 49> (for which no evidence survives) was found to have preserved wheat/rye (*Triticum* spp/*Secale cereale*) bran material, *Juncus* seed and fragment of moss leaf.
Wood (JW): mineralised wood on internal surfaces of hoops was identified as larch (*Larix* sp); {JW7}, SEM JW2. Individual staves could not be identified but the grain orientation exhibited means that the bucket could not have been carved out of a single piece of wood and was, therefore, stave-built.
Further wood (JW): Several areas of mineralised wood on exterior surfaces of the hoops are of oak (*Quercus* sp) with radial surfaces and the grain aligned vertically, representing the chamber walls. Sections of the chamber wall also preserved on the handle, on top of textile, but not clear enough to identify. A further area of mineral-preserved wood on the exterior of the bottom hoop, also oak, has the grain aligned horizontally and suggests the presence of a substantial baseplate; {JW8}.
Textile (SH): 9/1 is on the outer face of a detached iron and wood rim fragment, area 8 x 5mm, surviving as an impression on the wood. It presents as a fine, open weave, probably plain, SI 24 (7 on 3mm), but with no further recordable features. This fragment is not conclusively the same as that on hook 51/1 but is of a similar quality. Certain. [9 TF1]
? Shorten more when have drawings.

Playing pieces and gaming board

The counters and dice
The 57 gaming counters, <S 59>, and two dice <S 60> were found in a compact clump between the foot end of the coffin and the north wall of the chamber, close to the base of the stand <S 55> (Fig 84; Fig 90). They were lifted as block <46> and excavated in the laboratory. The 57 counters are summarised here as a group; their individual attributes are presented in CD Table 7.
CD Table 7 Dimensions and attributes of the whalebone counters

<S 59> Whalebone counters (Fig 210; Fig 284)
<82>–<85>, <87>–<96>, <98>–<140> [246]; period 4, S1
Found between north-east end of the coffin and north chamber wall
Group of 57 lathe-turned planoconvex counters, 43 complete (Wt 3–7g), the others mostly near complete but several chipped or split. Diam 28–32mm (average 31mm); H 8.9–12.9mm (average 11mm). Most have a low dome (37 examples below 11.5mm), but 20 appear taller; <83> and <102> have a slightly more conical profile. None have mandrel marks on the base but 16 have faint concentric indentations around the crown of the dome and/or over part of the body (notably <105>, <116>; <121, <122>). Although all were probably originally polished, many are now abraded. Material identified as whale bone (EC); confirmed in case of <102> and <104> by collagen analysis (below, 10.15).
Fig 285 Selected whalebone counters <S 59> (scale 1:?2)

<S 60> Antler dice (Fig 211; Fig 285)
<86>, [246]; period 4, S1

Found between north-east end coffin and north chamber wall
Incomplete cube with one near complete face (30.7 x 30.7mm) bearing a diagonal line of three dots (Diam *c* 5mm); only 50% of the opposing face survives but has dots in the corners, showing that there were originally four. One of the other two sides has five dots, while the opposing face has six dots. The other faces, which presumably had one and two dots each, are missing. Wt 23g.
Material identified as antler, probably red deer (EC); confirmed as antler by collagen analysis (below, 10.15).
Fig 286 Antler dice <S 60> (scale 1:?2)

<97>, [246]; period 4, S1
Found between north-east end coffin and north chamber wall
Incomplete cube (31.6 x 31 x 30.5mm) with two near complete adjacent faces bearing four and five dots (Diam *c* 4.7mm). The other two sides each have one dot in a corner but dots are otherwise missing. The other opposing faces have one and two dots on them. Wt 21g.
Material identified as antler, probably red deer (EC).

Weapons
Sword
<S 63> Iron sword
<39> [246]; period 4, S1
On chamber floor immediately to north of shield and at right angles to the coffin, hilt towards body. Lifted in soil block for excavation in the laboratory. Fitting <80> from coffin <S 12> was corroded to the upper surface of the blade as it lay in the grave.
Pattern-welded blade, tang broken and upper end missing; this appears to be post-depositional damage. Mineral-preserved remains of horn hilt assembly on tang and upper blade, consisting of remains of pommel, grip and guard; the grip has collars of ribbed gold wire at the junctions with the pommel and guard. Mineral-preserved remains of wooden scabbard with fleece lining on blade; mineral-preserved remains of a fine tape finished with a braid or decorative cord around the upper part of the scabbard; mineral-preserved remains of probable leather or skin between wood and braid; mineral-preserved textile over scabbard remains on both upper and lower surfaces of the blade as it lay in the ground; mineral-preserved plant material on the underside of the blade as it lay in the ground. L 905mm; blade L 795mm; blade W 60–62mm; W with scabbard remains 65–67mm.
Wood (JW): sample of mineralised wood from scabbard identified as *Fraxinus* sp (ash) with a radial surface (RLS); {JW1}.
Yarn (EC): sheep hair fibres, twisted yarns on the wooden scabbard surface. Comparison of yarn Diam indicates at least two types of textile in contact with the sword {EC20}, {EC31}, {EC35}, {EC37}.
Animal hair (EC): Sheep hair fibres located between the surface of the blade and the scabbard wood, on both faces of the blade and along its entire length {EC4}, {EC5}, {EC21}, {EC22}.
Animal hair (EC): sheep hair fibres located at the interface between coffin fitting <80> and the sword <S 63>, fibre diameters 38–83 microns {EC42}.
Skin (EC): possible mineralised skin tissue at the interface between coffin fitting <80>, the fitting and the sword <S 63>. This suggests a scabbard casing of skin or leather [EC42] Mineralised organic (EC): material on the tang is horn, indicating a 3-part handle assemblage {EC2}, {EC14}, {EC15}, {EC17}.
Fig 289 Iron sword <S 63> (scale 1:4)

<S 64> Textile from the sword <S 63>

Textile (SH): textiles associated with the construction of the scabbard are dealt with in full in the scabbard report. The other textiles reported here have the scabbard as a host object and are all mineralised.
{39 TF1} area 23 x 25mm on upper face of sword overlying leather at mid point of scabbard. Count 10/10 in an open weave but with no recordable spin. Presence of paired or possibly twined threads in both suggests a basket weave structure. Certain.
{39 TF2} area 18 x 15.5mm on upper face of the sword adjacent to and overlying {39 TF1}. Count 8(4 on 5mm)/10 (5 on 5mm) with thread Diam ranging from 0.2–1mm. Open weave of complex twill type, possibly 3/1; aligned with the sword. Certain.
{39 TF3} on central fragment of the sword, below {39 TF1}; appears to cover surface in contact with wood of scabbard, but is only visible in a raking light, as a fine plain weave. Uncertain.
{39 TF4} 7mm-wide narrow braid scabbard binding 155mm down from the hilt – see scabbard, Chapter 5.15, for detail. Certain.
{39 TF5} mineralised/extant tape around the hilt and on both faces – see scabbard, Chapter 5.15, for detail. Certain.
{39 TF6} area 12 x 16mm on detached scabbard fragment. Count of 14 (7 on 5mm)/ 12 (6 on 5mm), with some paired threads present, but with no recordable spin. Overlies {39 TF1} and {39 TF2}. Certain
{39 TF7} area 8 x 2mm adhering to a detached wood fragment; part of tape at the hilt. Parallel z threads visible. Certain.
{39 TF8} area of possible thread structure 4 x 4mm 20mm from the tip of the scabbard overlying leather. It has no recordable features. Uncertain.
{39 TF9} area of 9 x 9mm on underside near tip of scabbard. Count of 6(3 on 5mm)/? parallel strands, although only SI has survived, indicates a coarse material but with no identifiable weave structure. Certain.

Shield
<S 65> Composite shield
<40>, <141>, <150>, <151>, <155>, [246]; period 4, S1
On south side of chamber immediately north of sword. All shield components lifted in a soil block for excavation in the laboratory. Buckle <141> was recovered 55mm from fittings <150> and <151> and is therefore assumed to come from a shield strap. The position of the boss and fittings shows that the shield lay face down on the chamber floor.
<40> Iron shield boss
Found on its side facing downwards with apex towards the west digging into the chamber floor. Broken and incomplete, most of flange and part of cone missing; one section of flange, with a rivet, is broken and twisted upwards; cone slightly flattened above a break in the wall and along the edge of the flange; all of this appears to be old damage. Slightly convex cone, angled carination and slightly sloping wall; apical disc with applied silver sheet, the rod bent out of true; two dome-headed rivets survive on flange, the spacing between them suggesting that there were originally five. Mineral-preserved wood on

underside of flange and around rivet shank with two grain directions on the flange indicating where the handle was rebated into the outer surface of the shield board; possible mineral-preserved leather or skin on the underside of the flange; mineral-preserve plant remains over mineral-preserved textile on outside of cone and flange. Diam 130–40mm; H 92 mm.
Wood (JW): wood from shield board identified as *Salix* sp (willow) or *Populus* sp (poplar) with TLS; {JW3}.
Plant material (JW): masses of mineralised plant material preserved on outside of boss, some of which appears to be woven in a loose weave that may be some form of matting.
Textile (SH): Two areas of mineralised textile were identified on the outer face of the shield boss cone.
{40 TF1} 4mm-long fragment that emerged for 2mm from the overlying mass of plant fibres, that is, situated between the base layer and the shield boss laid upon it. Estimated count of 17 (7 on 4mm) x 15 (3 on 2mm), but with no spin identifiable. Possibly comprised several layers and was in direct contact with the iron of the boss. Weave structure unverifiable but presented as a fine plain weave where visible. Certain.
{40 TF2} area 25 x 15mm on the same cone fragment. Diffuse fibrous area, again emerging from under plant material. No recordable features determined, but appears to be a crumpled, rather than flat, layer of a fine cloth. Certain.
?Leather (EC): possible leather on the flange between the wood and iron – a thin layer of magnetite (0.5mm) too slight for sampling. If a skin product, this would indicate the front of the shield board was covered with skin or leather.
<155> Iron grip, upside down.
Broken and incomplete but dimensions known from x-ray. Short, flat with expanded terminals and a single rivet at either end. Mineral-preserved wood on inside; the wood grain shows two directions, running along the axis of the grip in the middle and across it at the terminals, confirming rebated construction; mineral-preserved plant remains on outside. L 147mm.
Wood (JW): wood from grip and shield board identified as *Salix* sp (willow) or *Populus* sp (poplar) with tangential surfaces; {JW4}.
Plant remains (JW): mineralised plant material on outer surface similar to that on boss <S 65>; miscellaneous.
<150> Iron shield fitting, upside down on chamber floor.
Disc-headed rivet, shank broken and missing. Mineral-preserved plant remains over possible mineral-preserved textile traces on face; mineral-preserved wood on underside. Diam 38mm.
Plant remains (JW): mineralised plant material on head similar to that on boss <S 65>, but difficult to see if it is woven or just random plant stems.
Textile (SH): {150 TF1} area 4 x 2mm of mineralised organic in contact with face of rivet and overlain by coarser plant fibre. Possibly remnants of a fine textile, but not conclusively identifiable as such. Uncertain.
{150 TF2} area of 3 x 3mm of mineralised organic in contact with iron. Although possibly plant fibre, a single strand with an ‘s’ twist is visible. Uncertain.
<151> Iron shield fitting, upside down on chamber floor.
Disc-headed rivet, 6mm of shank surviving; Diam 38mm.

Plant remains (JW): miscellaneous plant material on head.
Wood (JW): mineralised wood on underside.
Mineral-preserved plant remains on face; mineral-preserved wood on the underside and around the shank.
<141> Iron buckle, right-side up on inner face of shield board.
Plain oval loop and tongue. Max Diam 31mm.
Wood (JW): mineral-preserved wood on underside is probably *Salix* sp (Willow) or *Populus* sp and so almost certainly derives from the shield board; {JW5}, SEM JW3.
Leather (EC): Mineral-preserved leather inside the loop {EC13}.
Mineralised wood (JW): Shield board probably *Salix* sp (Willow) or *Populus* sp (Poplar) with rebated inserted handle. Organic remains indicate that the board was at least 10mm thick; mineral-preserved remains on the underside of the flange suggest that the front of the board was covered with skin or leather. The relative positions of the boss, fittings and buckle in the grave suggest that the board was at least 440mm in Diam. Buckle <141> suggests that the shield had an adjustable strap.
Fig 290 Iron shield fittings from composite shield <S 65> (scale 1:??)

Spearheads and arrowhead
The two spearheads <S 66> and <S 67> and arrowhead <S 68> were lying as a corroded lump over the lyre and were lifted in a block for excavation in the laboratory. X-radiography shows that both spearheads and the arrowhead lay diagonally across the lyre with blades to the east and sockets to the west, with iron hook <S 7> corroded to the spearhead sockets. The spears had probably been racked along the chamber wall (Chapter 4.5); their relative positions in relation to hook <S 7> shows that <S 66> was between <S 68> and the chamber wall.
<S 66> Iron spearhead (Fig 221; Fig 222; Fig 290; Fig 291)
<53>, [248]; period 4, S1
Lanceolate blade; split socket. The surface of the shaft is preserved in the socket split and for 12mm beyond the end of the socket: it is decorated with a carved two-strand interlace along the socket split and a horizontal band of Style II zoomorphic decoration below the end of the socket (Speake, Chapter 5.15). L 312mm (not including shaft remains); blade L 180mm.
Plant fibres (KS): some cell structure visible, probably roots.
Wood (JW): mineralised wood from inside socket identified as *Salix* sp (willow) or *Populus* sp (poplar); {JW13}, SEM JW4.
<S 67>> Iron spearhead (Fig 221; Fig 290; Fig 291)
<158>, [248]; period 4, S1
Angular blade; split socket. The surface of the shaft is preserved in the socket slit and is decorated with carved two-strand interlace. L 330mm; blade L 190mm.
Wood (JW): mineralised wood from inside socket, *Fraxinus* sp (ash) cut from mature timber.
Mineralised wood on outside of socket, *Quercus* sp (oak), with a tangential surface; possibly from collapsed chamber roof rather than wall; {JW14}.
<S 68> Iron arrowhead (Fig 223; Fig 290)
<159>, [248]; period 4, S1

Lanceolate blade; split socket; the shaft is preserved for 3mm beyond the end of the socket and is 8–10mm in Diam; internal Diam of socket is 8–9 mm. L 87mm (not including shaft remains); blade L 38mm.
Wood (JW): mineralised wood from inside socket, probably *Fraxinus* sp (ash); {JW12}, SEM JW5.
Fig 291 Iron spearheads <S 66> and <S 67> and arrowhead <S 68> (scale 1:2, detail at 1:1)
Fig 292 X-radiograph of spearhead bundle