

Data Table 6 Dimensions and attributes of the whalebone gaming pieces (all context [246])

Acc no.	Condition	Wt (g)	Diam (mm)	Circumference present (%)	H (mm)	Profile	Technology	Surface	Comments
<82>	A	3	30.0	65	9.4	LD			3 joining pieces; edge damaged; part of underside missing
<83>	G	7	32.0	100	12.9	CD		POL	slightly conical; slight evidence for turning
<84>	AD	3	30.0+	52	10.4	LD			slightly distorted
<85>	A	4	31.0	75	11.2	LD			near-complete; 25% of outer edge missing
<87>	AG	6	31.0	100	12.0	MD			
<88>	G	6	31.0	100	11.4	LD		POL	slightly damaged edge
<89>	AD	6	31.3	60	12.3	MD		POL	90% whole; slightly distorted; damaged underside; slightly damaged edge (c 40%)
<90>	A	6	31.0+	85	12.1	MD			31–31.5mm; 95% whole; slightly damaged edge (c 15%)
<91>	G	6	31.0 x 32.0	100	12.2	MD	T	POL	2 joining pieces; slightly oval; evidence for turning
<92>	GD	7	31.0	100	12.5	MD		POL	split, distorted and with uneven base
<93>	ALP	3	31.0	53	8.9	-			horizontally sliced; upper surface and parts of edge missing
<94>	ALD	2	30.0	60	9.1	LD			partly compressed; obliquely split, one side missing
<95>	AG	4	31.0	90	10.7	LD			c 30% of edge and part of underside missing
<96>	A	5	31.0	100	10.3	LD			upper surface damaged
<98>	A	5	31.0	100	10.5	LD			upper surface damaged
<99>	AL	3	28.0	10	9.8	-			c 40% whole; edge and part of underside missing
<100>	ALP	2	29.0	15	9.7	LD			2 joining pieces; c 40% whole; damaged upper surface, underside and edge
<101>	AG	5	31.0	100	11.2	LD			
<102>	AG	6	30.0	100	11.2	CD		POL	
<103>	ALG	6	32.0	60	12.6	MD			c 70% whole; split obliquely; part of edge missing; black streaks
<104>	G	6	30.5	100	11.7	MD			some black streaks
<105>	AG	6	31.5	100	11.6	MD	TC	POL	c 15% of edge damaged
<106>	LG	5	31.0	60	11.6	MD	T	POL	2 joining pieces; 90% whole; obliquely split, one side missing
<107>	A	4	30.0	100	9.7	LD	T		part of edge slightly damaged
<108>	AG	5	30.5	60	11.3	LD			c 90% whole; part of edge and underside missing
<109>	G	5	30.0 x 30.5	100	11.1	LD	?T	POL	

<110>	AG	6	30.5	100	10.5	LD		POL	slightly asymmetrical
<111>	DG	5	31.0	100	10.3	LD			cracked; distorted upper surface and underside
<112>	G	6	30.5	100	10.5	LD	T	POL	slightly abraded upper surface
<113>	G	6	31.0	90	11.0	LD	T	POL	99% whole; slight nick in edge
<114>	G	7	30.3	100	11.6	MD	T	POL	slightly conical dome; slight evidence for turning
<115>	G	6	31.5	100	12.1	MD	T		very slight damage to edge
<116>	G	6	30.6	100	11.7	MD	TC	POL	very slight damage to edge; evidence for turning, including circle at top
<117>	AG	5	31.0	100	11.0	LD		POL	very slight damage to edge
<118>	G	5	31.0	100	10.5	LD	T	POL	slightly asymmetrical profile ? caused by oblique cut
<119>	G	6	30.5	100	11.6	MD		POL	slightly asymmetrical profile
<120>	A	5	31.0	100	10.7	LD	T		damage to upper surface; very faint turning marks
<121>	AG	5	31.5	100	11.0	LD	TC	POL	abraded/damaged underside
<122>	G	6	30.0	100	11.2	LD	TC	POL	evidence for turning
<123>	AG	5	30.5	100	10.6	LD	T		evidence for turning
<124>	AL	5	31.0	65	12.7	MD	T		c 70% whole; split obliquely; edge missing
<125>	A	5	31.0	100	12.6	MD			damaged upper surface; smoothing marks on underside
<126>	A	4	30.5	80	12.0	MD			2 joining pieces; split longitudinally; some black streaks
<127>	A	4	30.0	65	10.2	LD			90% whole; slight damage around edge
<128>	A	4	30.0	50	11.2+	LD			c 70% whole; split longitudinally on one side; part of other side damaged
<129>	A	3	29.5	55	9.3	LD			c 77% whole; upper surface and edges damaged
<130>	AG	5	31.0	75	12.3	MD		POL	c 90% whole; damage to surfaces and near edge; black streaks
<131>	A	4	30.0	100	10.2	LD			2 joining pieces; slight damage around edge; black streaks
<132>	A	4	31.0	100	9.4	LD			c 95% whole; 2 joining pieces; damage along longitudinal split; black streaks
<133>	AD	4	31.5	75	10.4+	LD			c 80% whole; old damage to edge; recent damage to top
<134>	G	4	30.5	88	9.9	LD		POL	c 98% whole; damage to edge
<135>	AP	4	30.0	50	10.3	LD			2 joining pieces; edge, upper surface and underside damaged
<136>	P	3	29.0+	25	11.1+	LD			very battered; damage to top, underside and edge

<137>	AP	3	30.0	50	10.8+	LD			<i>c</i> 55% whole; split irregularly
<138>	AP	3	31.0	30	12.4	MD			<i>c</i> 50% whole; damage to upper surface and edges
<139>	AP	3	30.0+	30	10.7	LD			<i>c</i> 50% whole; split on two sides; upper surface damaged
<140>	AP	3	31.0+	35	12.0	MD			<i>c</i> 60% whole; 2 joining pieces; damage to surfaces; much of edge missing

Key:

Condition: A - abraded; D - distorted; G - good; L - laminated; P - poor

Profile: CD - conical dome; LD - low dome; MD - medium dome

Technology: T - turned; TC - turned with circular dimple at top

Surface: POL - polished

Data Table 7 Soil micromorphology samples and counts

Core sample	Thin section	Relative depth (mm)	Context	Microfacies type (MFT)	Soil microfabric type (SMT)	Voids (%)	Gravel	Stones	Root traces	Charcoal	Wood char
Mon 4	M4A	0–70	[39]	C3	1a, 1b	40/50	*	*	a*	a*	
Mon 4	M4B	70–140	[39]/[40]	C2	1a, 1b	60	*	f		a*	
Mon 4	M4C	140–195	[40]	C1	1a, 1b, 2a	55	f	ff	a*	a	
Mon 5	M5A	40–90	[44]	B1	1a, 1b, 1d, 2a	45	f	fff		aaa(aaaaa)	aa
Mon 5	M5A	90–115	[48]	A2	1a, 1b, 1c, 2a	35	f	ff		aa	
Mon 5	M5B	115–150	[48]	A1	1a, 1b, 2a	40(25)	ff	ff	a*	aaa	
Mon 8	M8A	5–80	[37]a	A4	1a, 1c, 3a	50	f			a	
Mon 8	M8B	80–155	[37]b/[37]c	A3/D1	1a(3a)/3a(1a)	40/55	f/*	f/0		aa/a*	
Column heads (cont'd):	Thin section	Burnt mineral	Orange clay coats	Brown clay coats	Reddish clay infill	Dusty/matrix coats	Weak 2ndary Fe	Broad burrows	V broad burrows	V thin excrement	Broad excrement
	M4A	a		aa				aaaaa	aaa	aaa	aaaaa
	M4B	a*		a				aaaaa	aaaaa	aa	aaaaa
	M4C	aa		a		a		aaaaa	aaaaa	aa	aaaaa
	M5A	aaaa		aa	a	a	a	aaaaa	aaaa	aaaa	aaaa
	M5A	aaa		aa			a	aaa		aaaa	aa
	M5B	aaa		aaa			aa	aaaa	aaaa	aaaaa	aa
	M8A	a	aaa	aaa		a*	aa	aaaa	aaaa	aa	aaaa
	M8B	aa/a*	aaa/aaaa	aa/a		a*/a*		aaaa/a	aaaa/aa		

Key:

* - very few (0–5%); f - few (5–15%); ff - frequent (15–30%); fff - common (30–50%); ffff - dominant (50–70%); fffff - very dominant (>70%)
a - rare (<2% (a* - 1%; a-1, single occurrence)); aa - occasional (2–5%); aaa - many (5–10%); aaaa - abundant (10–20%); aaaaa - very abundant (>20%)

Data Table 8 Soil micromorphology descriptions and preliminary interpretations

Microfacies type (MFT) / soil microfabric type (SMT)	Thin section	Depth (relative depth) Soil micromorphology (SM)	Preliminary interpretation & comments
MFT C3 / SMT 1a & 1b	M4A	0–70mm SM: heterogeneous SMT 1a and 1b. <i>Microstructure</i> : sub-angular blocky, crumb, becoming more massive compact sub-angular blocky upwards, 40% voids/50% voids, mainly poorly accommodated curved planar voids, and simple and complex packing voids; fine channels and closed vughs in intact SMT 1b soil. <i>Coarse mineral</i> : C:F, as SMT 1a and 1b, very few gravel and small stones (>8mm). <i>Coarse organic and anthropogenic</i> : rare calcined (>2mm) and rubefied flint, trace of fine (max 150µm) root concentrations and charcoal (max 0.5mm). <i>Fine fabric</i> : as SMT 1a and 1b. <i>Pedofeatures – textural</i> : occasional concentrations of brown clay void infills and coatings (max microlaminated infill = 0.6mm); <i>fabric</i> : very abundant broad and many very broad burrows; <i>excrements</i> : many very thin, with very abundant broad organo-mineral excrements.	Context [39] Mixed humic and moderately humic soil, with sub-angular blocky crumb, becoming more massive compact sub-angular blocky upwards. More ‘intact’ soil containing occasional concentrations of brown clay void infills and coatings (max microlaminated infill = 0.6mm), occurs upwards too. Overall, there are very few gravel and small stones (>8mm), rare calcined (>2mm) and rubefied flint, trace of fine (max 150µm) root concentrations and charcoal (max 0.5mm). Very abundant broad and many very broad burrows, and many very thin, with very abundant broad organo-mineral excrements, are present. <i>Context [39] is characterised by more intact turf material, which includes brown clay infill and void coating features. This turf is also almost stone-free.</i>
MFT C2 / SMT 1a & 1b	M4B	70–140mm SM: very heterogeneous with common SMT 1a, and intact SMT 1b becoming more dominant upwards. <i>Microstructure</i> : very open, loose, crumb and sub-angular blocky, 60% voids, mainly poorly accommodated curved planar voids, and simple and complex packing voids (relict turf with 35% voids). <i>Coarse mineral</i> : C:F as SMT 1a and 1b, few gravel and small stones (max 12mm). <i>Coarse organic and anthropogenic</i> : trace of fine charcoal and burnt flint (calcined). <i>Fine fabric</i> : as SMT 1a and 1b. <i>Pedofeatures – textural</i> : rare concentration of brown clay void infills and coatings; <i>fabric</i> : very abundant broad and very broad burrows; <i>excrements</i> : occasional very thin, with very abundant broad organo-mineral excrements.	Context [39]/[40] Very heterogeneous moderately humic soil, becoming more humic and as intact turf fragments, upwards, but with a very open, loose crumb and sub-angular blocky structure overall. There are few gravel and small stones (max 12mm) and a trace of fine charcoal and burnt flint (calcined). Rare concentrations of brown clay void infills and coatings, very abundant broad and very broad burrows, and occasional very thin, with very abundant broad organo-mineral excrements, occur. <i>Strongly biologically worked horizon, as below (context [48] in M4C), partially mixing turf material upwards into more intact turf layers (context [39]). Possibly there was a hiatus in construction at this junction.</i>
MC1 / SMT 1a & 1b	M4C	140–195mm SM: heterogeneous with common SMT 1a and 1b, with frequent SMT 2a. <i>Microstructure</i> : loose, fragmented sub-angular blocky and crumb, 55% voids, simple and complex packing voids, with fine channels and vughs in peds. <i>Coarse mineral</i> : C:F, as SMT 1 and 2, with frequent gravel and small stones (max >8mm; flint and silicate rocks). <i>Coarse organic and anthropogenic</i> : occasional sharply angular rubefied burnt flints; trace of very fine roots, rare fine charcoal (max 750µm). <i>Fine fabric</i> : as SMT 1a, 1b and 2a. <i>Pedofeatures – textural</i> : rare concentration of brown clay void infills and coatings; rare very thin (50µm) dusty matrix void coatings; <i>fabric</i> : very abundant broad and very broad burrows; <i>excrements</i> : occasional very thin, with very abundant broad organo-mineral excrements.	Context [40] Heterogeneous fine sandy silt loam with loose, open, fragmented sub-angular blocky and crumb structure. Present are: with frequent gravel and small stones (max >8mm; flint and silicate rocks), occasional sharply angular rubefied burnt flints; trace of very fine roots, rare fine charcoal (max 750µm). This context is characterised by rare concentration of brown clay void infills and coatings, rare very thin (50µm) dusty matrix void coatings, very abundant broad and very broad burrows, and occasional very thin, with very abundant broad organo-mineral excrements. <i>Turf layer with much working by roots and soil invertebrate mesofauna, and only small amounts of original turf soil remaining. The latter includes brown clay textural pedofeatures.</i>
MFT B1 / SMT 1a, 1b, 1d & 2a	M5A	40–115mm 40–90mm (context [44]) SM: very heterogeneous with common humic SMT 1a and 1b, with minerogenic SMT 2a, and charcoal-rich SMT 1d. <i>Microstructure</i> : loose fragmented sub-angular blocky and crumb (fine pellety), 45% voids, chambers, simple and complex packing voids. <i>Coarse mineral</i> : C:F, as below, with common fine gravel and stones (max 18mm). <i>Coarse organic and anthropogenic</i> : abundant fire-cracked flints (max 20mm) and very abundant charcoal in sloping 20mm thick basal layer; charcoal includes wood char, and rare void infills of reddish clay. <i>Fine fabric</i> : SMT 1d, as SMT 1b with very abundant very fine and fine charcoal. <i>Pedofeatures – as below, with textural</i> : rare reddish clay infilling charcoal voids (moderately well oriented, bright yellow under OIL), rare brown clay infills in compact soil fragments; rare very dusty/matrix coatings to current peds; <i>amorphous</i> : as below; <i>fabric</i> : very abundant broad burrows (of humic soil) in relict compact peds; abundant very broad burrows – fragmenting soil layers; <i>excrements</i> : as below, with abundant broad organo-mineral excrements. EDS: Irregular, moderately diffuse boundary to:	Context [44] Very heterogeneous with semi-layered soil (humic, minerogenic and charcoal-rich materials) and common fine gravel and stones (max 18mm). There are abundant fire-cracked flints (max 20mm) and very abundant charcoal in sloping 20mm thick basal layer (charcoal includes wood char, and rare void infills of reddish clay). Pedofeatures are similar to below, with rare reddish clay infilling charcoal voids (moderately well oriented, bright yellow under OIL), rare brown clay infills in compact soil fragments and rare very dusty/matrix coatings to current peds. Also present are very abundant broad burrows (of humic soil) in relict compact peds; abundant very broad burrows – fragmenting soil layers – and abundant broad organo-mineral excrements. EDS: mineral-stained charcoal with 0–3.10% K, 5.81–12.60% Ca and 5.53–6.07% Fe; reddish clay within charcoal (0.49–0.52% P, 5.96–8.76% Fe) <i>Semi-layered loose deposits of earthworm-burrowed turf and upper subsoil (Eb horizon) fragments and stones, with a 20mm thick sloping layer of burnt flint and charcoal at the basal junction with context [48]. This fire debris</i>

MFT A2 / SMT 1a, 1b, 1c & 2a		<p>90–115mm (context [48])</p> <p>SM: heterogeneous with common area of minerogenic and sandy SMT 2a, with frequent SMT 1a and 1b, and weakly rubefied SMT 1c at junction with context [44].</p> <p><i>Microstructure</i>: massive, compact fine sub-angular blocky and possible crumb, fine pellety, 35% voids, poorly accommodated planar voids, channels and vughs. <i>Coarse mineral</i>: C:F, as SMT 1a and 1b; 2a = 90:10; poorly sorted as M5b, below, with frequent rounded and sharply angular flint gravel (max >10mm). <i>Coarse organic and anthropogenic</i>: many fire-cracked flint shards, occasional fine charcoal (max 750µm), many rubefied fine fabrics towards the ‘surface’ – brown clay infills are affected. <i>Fine fabric</i>: SMT 1c: PPL and XPL, as SMT 1b, with brownish to reddish-brown (OIL); SMT 2a: speckled dark grey (PPL), isotropic (close porphyric, undifferentiated b-fabric (XPL)), yellow (OIL), rare very fine amorphous organic matter and trace of very fine charcoal.</p> <p><i>Pedofeatures – textural</i>: occasional brown clay infills (as in M5B), some microlaminated and one example around burnt flint inclusion; rare, normally very thin (50–100µm) fine matrix material coatings, eg of capping fine material on flint fragment; <i>amorphous</i>: occasional weak iron impregnation of fine fabric; <i>fabric</i>: many relict broad burrows; <i>excrements</i>: abundant very thin and occasional broad excrements.</p> <p>EDS:</p>	<p><i>includes reddish clay associated with in situ weathering of ashes. Some fire debris may have still been hot when dumped as the uppermost part of context [48] is weakly heated.</i></p> <p>Uppermost context [48]/context [45]</p> <p>Heterogeneous fine sandy silt loam with humic, poorly humic, minerogenic and rubefied (burnt) soil material. It has a massive, compact fine sub-angular blocky and possible crumb, fine pellety microstructure, and includes frequent rounded and sharply angular flint gravel (max >10mm). Many fire-cracked flint shards, occasional fine charcoal (max 750µm), and many rubefied fine fabrics towards the ‘surface’ (including affected brown clay infills), occur. There are occasional brown clay infills (as in M5B), some microlaminated and one example around a burnt flint inclusion, and rare normally very thin (50–100µm) fine matrix material coatings, and a capping of fine material on flint fragment, were noted. Also present are occasional weak iron impregnation of fine fabric, many relict broad burrows, and abundant very thin and occasional broad excrements. EDS: brown clay and iron-stained soil with 0.32–1.64% P and 6.24–44.5% Fe, respectively.</p> <p><i>Mixed turf and upper subsoil (Eb horizon) soil materials, with again anomalous presence of brown clay void infills. ‘Surface’ heating has affected the soil and an example of brown clay infill, showing it not to be post-depositional.</i></p>
MFT A1 / SMT 1a, 1b & 2a	M5B	<p>115–150mm</p> <p>SM: heterogeneous with dominant poorly humic SMT 1a and frequent moderately humic SMT 1b and minerogenic SMT 2a.</p> <p><i>Microstructure</i>: massive, with horizontal and sloping fissures, fine pellety, 40% voids, fissures and chambers (25% intrapedal voids – fine channels and vughs). <i>Coarse mineral</i>: C:F (coarse:fine limit at 10µm), 1a = 85:15, 1b = 75:25; very poorly sorted with coarse silt, fine to very coarse sand, frequent fine gravel and small stones (max 16mm; sub-rounded to angular flints), quartz, quartzite, feldspar, flint and iron-stained flint. <i>Coarse organic and anthropogenic</i>: abundant rubefied flint gravels and small stones, especially upwards, with fine rubefied burnt mineral material throughout; many charcoal (max 1.7mm); trace of roots (browned, max 750µm). <i>Fine fabric</i>: SMT 1a: dotted and dusty darkish yellow-brown (PPL), isotropic (close porphyric, undifferentiated b-fabric (XPL)), brownish-yellow (OIL), thin humic staining, many very fine amorphous organic matter and rare very fine charcoal – phytoliths noted; SMT 1b: dotted and dusty blackish-brown (PPL), isotropic (close porphyric, undifferentiated b-fabric (XPL)), yellowish-brown (OIL), humic staining, many very fine amorphous organic matter and rare very fine charcoal, trace of fine rubefied mineral – phytoliths noted; for SMT 2a – see M5A, above. <i>Pedofeatures – textural</i>: many moderately well oriented brownish clay, sometimes microlaminated, void infills (max 400µm) and coatings within massive peds; <i>amorphous</i>: occasional weak iron staining of relict humic fabrics; <i>fabric</i>: abundant fine fabric intercalations (relict of broad burrowing); abundant very broad burrows and associated loose sand and/or soil clasts infills; <i>excrements</i>: very abundant very thin pellety excrements and occasional broad organo-mineral excrements.</p> <p>EDS:</p>	<p>Context [48]</p> <p>Heterogeneous poorly and moderately humic compact fine sandy silt loam (which includes phytoliths), now broadly fissured and burrow-fragmented. Frequent fine gravel and small stones (max 16mm) occur, alongside abundant rubefied flint gravels and small stones, especially upwards, with fine rubefied burnt mineral material throughout. There are also many charcoal (max 1.7mm) and trace amounts of roots (browned, max 750µm). This context is characterised by many moderately well-oriented brownish clay, sometimes microlaminated, void infills (max 400µm) and coatings within massive peds; occasional weak iron staining of relict humic fabrics; abundant fine fabric intercalations (relict of broad burrowing); abundant very broad burrows and associated loose sand and/or soil clasts infills; and very abundant very thin pellety excrements and occasional broad organo-mineral excrements. EDS: brown clay coatings sometimes enriched in P (eg 0.46–0.50% P) and usually associated with small or large amounts of iron (4.50–22.70% Fe), compared to background soils which are phosphate-free.</p> <p><i>Soil of likely turf origin has been compacted and mixed with burnt and unburnt flints and small amounts of charcoal. Compact soil includes brown clay textural pedofeatures, which are anomalous for turf soils; textural pedofeatures are also unrelated to current porosity and hence unrelated to any constructional or post-depositional activity.</i></p>
MFT A4 / SMT 1a, 1c & 3a	M8A	<p>5–80mm</p> <p>SM: extremely heterogeneous with loose sand, frequent argillic sands (SMT 3a), fine charcoal-rich (SMT 1a) and poorly humic sandy silty loam (SMT 1c). <i>Microstructure</i>: part structure-less, part massive and part sub-angular blocky and crumb, mean 50% voids, simple and complex packing voids, channels, open vughs and chambers. <i>Coarse mineral</i>: C:F, as 1a, 1c and 3a, with few gravel (max 9mm – eg flint). <i>Coarse organic and anthropogenic</i>: rare burnt mineral (including both calcined and rubefied flint) and rare charcoal (<0.5mm). <i>Fine fabric</i>: as 1a, 1c and 3a. <i>Pedofeatures – textural</i>: many patches of argillic sands (see M8A), with many areas of dark brownish and finely dusty coatings affecting sands and coarse inclusions and some voids within fine humic soil; <i>amorphous</i>: occasional iron staining of once-humic fine soil areas; <i>fabric</i>: abundant broad and very broad burrows; <i>excrements</i>: abundant broad organo-mineral excrements, some in chambers; occasional thin organo-mineral excrements in once-humic soil.</p> <p>BD: pH = 6.5.</p>	<p>Context [37]a</p> <p>Extremely heterogeneous with loose sand, frequent argillic sands, fine charcoal-rich and poorly humic sandy silty loam soil areas, and with few gravel (max 9mm – eg flint). Soil contains rare burnt mineral (including both calcined and rubefied flint) and rare charcoal (<0.5mm). There occur many patches of argillic sands (see M8A), with many areas of dark brownish and finely dusty coatings affecting sands and coarse inclusions and some voids within fine humic soil. There are also occasional iron staining of once-humic fine soil areas, abundant broad and very broad burrows, abundant broad organo-mineral excrements – some in chambers – and occasional thin organo-mineral excrements in once-humic soil. Neutral pH = 6.5.</p> <p><i>Fragmented turf, subsoil Eb and Bt sands present, with rare amounts of anthropogenic material, relict of previous land use. Collapsed turf mound material.</i></p>
MFT A3 / SMT 1a (3a)	M8B	80–155mm	Context [37] (contexts [37]b over [37]c)

<p>over MFT D1/SMT 3a (1a)</p>		<p>SM: very heterogeneous with very dominant argillic sands (SMT 3a) below 120mm, with few SMT 1a, becoming mixed common argillic sands and fine charcoal-rich sands (SMT 1a) above 120mm. <i>Microstructure</i>: structure-less becoming massive, channel upwards, 55% voids becoming 40% voids upwards, simple packing voids becoming complex packing voids, channels and open vughs. <i>Coarse mineral</i>: C:F, SMT 1a as 1a, SMT 3a C:F = 90:10; below 120mm, moderately well-sorted fine and medium sands, with very few coarse silt, coarse sand and small gravel (max 3mm), with above 120mm, poorly sorted coarse silt, fine to very coarse sands, and few gravel (max 10mm, including rounded chert, flint and quartzite) and stones (max 17mm flint pebble). <i>Coarse organic and anthropogenic</i>: trace of charcoal and burnt mineral below 120mm, with rare fine charcoal (max 2mm+) and burnt mineral material, including 3mm angular burnt chert (rubefied material also present). <i>Fine fabric</i>: SMT 3a: orange brown (PPL), low to moderate interference colours (single grain, coated grain, linked grain, stipple speckled b-fabric (XPL)), yellow (OIL). <i>Pedofeatures – textural</i>: abundant clay void and grain coatings, inner coatings are limpid, outer (later coatings are dusty), 50–100µm thick, below 120mm; above 120mm there are many patches of this ‘argillic’ soil, with occasional brownish void clay coatings within SMT 1a; <i>fabric</i>: occasional very broad (4mm) below 120mm, with very abundant very broad burrows above.</p> <p>BD: pH = 6.4</p>	<p>This context is very heterogeneous with very dominant argillic well-sorted fine and medium sands below 120mm (relative depth), with few fine charcoal-rich poorly sorted silts and sands, becoming mixed common argillic sands and fine charcoal-rich sands above 120mm. There are very few small gravel (max 3mm), below 120mm, and few gravel (max 10mm, including rounded chert, flint and quartzite) and stones (max 17mm – flint pebble) above 120mm. A trace of charcoal and burnt mineral was noted below 120mm, while there are rare fine charcoal (max 2mm+) and burnt mineral material, including 3mm angular burnt chert (rubefied material also present), above 120mm depth. The fill is characterised by soil with abundant clay void and grain coatings (inner coatings are limpid, outer/outer coatings are dusty and 50–100µm thick), below 120mm; above 120mm there are many patches of this ‘argillic’ soil, with occasional brownish void clay coatings within the fine charcoal-rich soil. Occasional very broad (4mm) burrows were found below 120mm, with very abundant very broad burrows being present above. The soil has weakly acid pH (pH = 6.4).</p> <p><i>This is collapsed mound soil composed of mixed semi-intact natural acidic well-sorted natural fine and medium sands of the local Bt subsoil horizon – presumably excavated on site to produce the grave chamber. The overlying and mixed soils are relatively humic, charcoal-rich loamy sands, of anthropogenic origin (containing phytoliths). These earthworm-worked turf soils also show dark clay coatings, of possible animal trample origin, originally.</i></p>
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Key:

OIL – oblique incident light; PPL – plane polarised light; XPL – crossed polarised light

DATA TABLES 9-10 (TEXTILE) IN SEPARATE FILE

Data Table 11 Summary of wood samples including SEM observations and forming index to associated SEM images in Data Fig 51

Sample no.	Object	Sample	Identification	SEM no.	Image no. on Data Fig 51
{JW1}	<S63>, <39> sword	wood from scabbard	<i>Fraxinus</i> sp (ash)	-	-
{JW2}	<S12>, <80> angle bracket	wood from coffin <S12>	not identifiable	-	-
{JW3}	<S65>, <40> shield	wood from shield board	<i>Salix</i> sp (willow) or <i>Populus</i> sp (poplar)	-	-
{JW4}	<S65>, <40> shield	wood from shield grip	<i>Salix</i> sp (willow) or <i>Populus</i> sp (poplar)	-	-
{JW5}	<S65>, <141> shield strap buckle	wood from reverse	<i>Salix</i> sp (willow) or <i>Populus</i> sp (poplar)	JW 3	-
{JW6}	<S48>, <8> bucket	wood from stave	<i>Taxus</i> sp (yew)	JW 1	jw1, 1–5
{JW7}	<S49>, <9> bucket	wood from stave	<i>Larix</i> sp (larch)	JW 2	jw2, 1–11
{JW8}	<S49>, <9> bucket	wood from outside of bottom iron hoop	<i>Quercus</i> sp (oak)	-	-
{JW9}	<61> sword from grave [121]	wood from scabbard	<i>Fagus</i> sp (beech)	JW 7	jw7, 1–4
{JW10}	<152> shield fitting from grave [121]	wood from shield board	<i>Salix</i> sp (willow) or <i>Populus</i> sp (poplar)	-	-
{JW11}	<63> spearhead from grave [121]	wood from socket	<i>Fraxinus</i> sp (ash)	-	-
{JW12}	<S68>, <159> arrowhead	wood from socket	<i>Fraxinus</i> sp (ash)	JW 5	jw5, 1–2
{JW13}	<S66>, <53> spearhead	wood from socket	<i>Salix</i> sp (willow) or <i>Populus</i> sp (poplar)	JW 4	jw4, 1–2
{JW14}	<S67>, <158> spearhead	wood from outside of socket	possibly <i>Quercus</i> sp (oak)	-	-
{JW15}	<S22>, <142> a wood of box	wood from under <S24> cylindrical container in box <S22>	<i>Acer</i> sp (maple)	-	-
{JW16}	<S22>, <178> wood of box	wood on top of <S24> cylindrical container and <S25> spoon in box <S22>	<i>Acer</i> sp (maple)	-	-
{JW17}	<S27>, <179> wooden ?disc/lid	whole object	<i>Betula</i> sp (birch)	JW 6	jw6, 1–6
{JW18}	<S22>, <142> wood of box	main wood of box	<i>Acer</i> sp (maple)	-	-
{JW19}	<S61>, <57> gaming board iron plate	wood from board side A	possibly <i>Fagus</i> sp (beech)	-	-
{JW20}	<S61>, <57> gaming board iron plate	wood from board side B	possibly <i>Fagus</i> sp (beech)	-	-
{JW21}	<S61>, <59> gaming board iron plate	wood from board	probably <i>Fagus</i> sp (beech)	JW 14	jw14, 1–4
{JW22}	<S61>, <65> gaming board iron plate	wood from board A	<i>Fagus</i> sp (beech)	JW 11	jw11, 1–4
{JW23}	<S61>, <65> gaming board iron plate	wood from board B	<i>Fagus</i> sp (beech)	JW 12	jw12, 1–3
{JW24}	<S61>, <58> gaming board drop handle	wood from board on attachment loop	<i>Fagus</i> sp (beech)	JW 13	-
{JW25}	<S58>, <54> lyre sound board	wood from repair JJ (RLS)	very crushed sample, possibly <i>Acer</i> sp (maple), with hairs on surface	JW 9	wood jw9, 1–5 hairs jw9, 6–18
{JW26}	<S58>, <54> lyre sound box	wood from repair KK (TLS)	<i>Acer</i> sp (maple)	JW 10	jw10, 1–2
{JW27}	<S50>, <7> tub	wood from stave	conifer	-	-
{JW28}	<S51>, <78> copper-alloy bowl	wood from underside, representing base of tub <S50>	<i>Taxus</i> sp (yew)	JW 8	jw8, 1–2
{JW29}	<S62>, <79> scythe	wood from handle	<i>Salix</i> sp (willow) or <i>Populus</i> sp (poplar)	-	-
{JW30}	<S12>, <43> angle bracket	wood from coffin <S12>	<i>Fraxinus</i> sp (ash)	-	-
{JW31}	<144> spearhead from ditch [87]	wood from socket	poor sample, not identifiable	-	-

Note:

{EC24} (Data Table 12) sample from box <S22>, <178>: simple perforation plates, ?spiral thickening, rays 3–5 cells wide, ?solitary pores – more likely to be maple rather than lime.

Data Table 12 Summary of animal-derived remains sampled for SEM and forming index to SEM images in Data Fig 52

Sample no.	Host object & nature of remains	Identification	Image no. on Data Fig 52
{EC1}	buckle <S15>, black flecks associated with buckle: ?skin/?leather	no skin/leather structure; possibly degraded bone (? human remains)	{EC1}, 0001–0004
{EC2}	sword <S63>, substance on tang: ?horn, ?ivory, ?bone or ?antler	layered, ridged, possible horn; inconclusive	{EC2}, 0005–0010
{EC3}	sword <S63>, substance covering wooden scabbard, all over	too degraded to identify	{EC3}, 0011–0012
{EC4}	sword <S63>, hairs on blade	hair fibres, no scale pattern	{EC4}, 0013
{EC5}	sword <S63>, hairs on blade	hair fibres, no scale pattern	{EC5}, 0014
{EC6}	sword <61> from grave [121], hairs on blade	scale pattern indicates sheep	{EC6}, 0037–0040
{EC7}	knife <64> from grave [121], substance on blade	3d weave indicates skin or leather	{EC7}, 0041–0042
{EC8}	knife <64> from grave [121], substance on tang	layered, platy, indicates horn	{EC8}, 0043–0044
{EC9}	sword <61> from grave [121], hairs from blade, detached in bag	no scale pattern	-
{EC10}	sword <61> from grave [121], hairs from blade, detached in bag	scale pattern indicates sheep	-
{EC11}	shield mount <154> (part of <62>) from grave [121], substance beneath mount	confirmed as skin or leather	{EC11}, 0045–0046
{EC12}	shield handle <156> (part of <62>) from grave [121], substance on iron surface, facing towards back of shield	confirmed as skin or leather	{EC12}, 0047–0050
{EC13}	buckle <141> from shield <S65>, substance inside buckle loop	confirmed as skin or leather	{EC13}, 0051–0055
{EC14}	sword <S63>, substance of pommel	confirmed as horn	{EC14}, 0015–0021
{EC15}	sword <S63>, substance of grip	confirmed as horn	{EC15}, 0022–0031
{EC16}	sword <61> from grave [121], hairs from blade surface	scale pattern indicates sheep	{EC16}, 0032–0035
{EC17}	sword <S63>, substance of guard	confirmed as horn	{EC17}, 0056–0062
{EC18}	sword <S63>, substance covering wooden scabbard, all over	too degraded to identify	{EC18}, 0063
{EC19}	drinking horn <S39>, comparing two forms of non-mineralised horn from same vessel: one translucent, preserved by copper alloy; the other opaque, more degraded (both part of same vessel wall)	translucent material still recognisable as horn ; the other unrecognisable	{EC19}, 0064–0070
{EC20}	sword <S63>, substance covering wooden scabbard	confirmed as degraded textile	{EC20}, 0071–0072
{EC21}	sword <S63>, hairs on blade	scale pattern indicates sheep	{EC21}, 0073–0074
{EC22}	sword <S6>, hairs on blade	scale pattern indicates sheep	{EC22}, 0075
{EC23}	rivet <73> from comb <S23>, osseous material on rivet shaft	confirmed as antler	{EC23}, 0076–0083
{EC24}	underside of box <S22>, <178>, dark brown substance, sample in contact with spoon handle, grain direction with the spoon	using binocular microscopy, identified as wood (see note at end of Data Table 11)	-
{EC25}	underside of box <S22>, <178>, lens of pale-coloured material, Th 2mm; in burial this lay over wood <142> at N end and some S-links of cylindrical container <S24> (<S29> {178 TF1} in Data Table 9)	confirmed as textile	{EC25}, 0084–0088
{EC26}	underside of box <S22>, <178>, dark brown substance, sample from above cylindrical container <S24>	using binocular microscopy, identified as wood	-
{EC27}	box <S22>, <178>, dark brown substance from finial end of spoon <S25>	using binocular microscopy, identified as wood	-
{EC28}	knife <S28>, <77>, thin layer of magnetite looking like skin or leather covering handle on <77>a–b	too degraded to identify, the sample is amorphous	{EC28}, 0089–0090
{EC29}	copper-alloy cylindrical container <S24>, small lens of pale-coloured material beneath outline of cylinder	confirmed as wood	{EC29}, 0091–0093
{EC30}	wall hook <S7>, white deposit on hook	natural concretion	{EC30}, 0094–0095
{EC31}	sword <S63>, side facing up in burial, tape binding at blade edge near scabbard mouth; ?silk, ?wool or ?linen (<S64> {39 TF5} in Data Table 9)	scale pattern indicates sheep's wool	{EC31}, 0096–0098
{EC32}	sword <S63>, side facing up in burial, ochreous-grey deposit on scabbard 118mm below mouth; ?textile	no evidence of textile, the deposit appears to be natural concretion	-
{EC33}	sword <S63>, side facing up in burial, 178mm below scabbard mouth, fibres on wooden surface; ? animal hairs	fibres have a cellular plant structure	{EC33}, 0105–0107
{EC34}	sword <S63>, side facing up in burial, at mid point on scabbard wood, ochreous deposit; possible scabbard casing; ?skin or ?leather	no evidence of skin or leather	-
{EC35}	sword <S63>, side facing down in burial, possible decayed textile in area 50–90mm below scabbard mouth	twisted yarn, trace of scale pattern; confirmed as textile	{EC35}, 0108–0110

{EC36}	sword <S63>, side facing down in burial, possible decayed textile 205–285mm below scabbard mouth	no evidence of textile, yarn or fibre; the sample is amorphous	{EC36}, 0111
{EC37}	sword <S63>, side facing down in burial, 318mm below scabbard mouth, fibres on surface of scabbard wood	animal hair fibres, but no scale pattern, poor condition; twisted yarn, confirmed as textile	{EC37}, 0111a, 0112–0113
-	sword <S63>, side facing down in burial, near tip of scabbard, possible environmental evidence of grass-like stalks	-	-
{EC38}	comb <S23>, rivet <163>, possible textile on one end of rivet	textile was seen on end of rivet but this sample does not confirm it (poor sample)	{EC38}, 0114–0116
{EC39}	knife <S28>, <77>c, lump of compacted gravel with hole, lined with layered organic material	ordered, layered, interlocking structure; unidentified	{EC39}, 0117–0124
{EC40}	lyre <S58>, <54>, LL, fibres on wooden surface	animal fibres too degraded to identify species	{EC40}, 0132–0136
{EC41}	lyre <S58>, <54>, JJ, fibres on wooden surface	animal fibres too degraded to identify species	{EC41}, 0025–0131
{EC42}	coffin angle bracket <S12>, <80>, where it was in contact with sword scabbard <S63>; mpo on <80> seems to have been transferred from scabbard <S63>; evidence suggests scabbard wood was covered by leather, which was covered by hair fibres, which were overlain by iron fitting <80>	some fibres are of wood , possibly from the coffin or scabbard; some fibres are animal hair , one with scale pattern too poor to identify; background material around the fibres possibly degraded skin or leather	{EC42}, 0145–0149
{EC43}	die <S60>, <97>, detached fragments; ?bone or ?antler	confirmed as antler	{EC43}, 0137–0144
{EC44}	drinking cup <S47>, vessel wall sampled from below rim; described as wood, but is it ?horn	confirmed as wood	{EC44}, 0145–0146
{EC45}	wooden box <S22>, <142>, lower; flock-like material 'a' overlying pigment	mixture of degraded plant fibres and fungal mycelia ; fibre Diam 43µm, single direction	{EC45}, 0150–0158
{EC46}	wooden box <S22>, <142>, lower; flock-like material 'b' overlying pigment	flat strips or flattened tubes, pimples surface, knotted in tight bundle, multi-directional; possibly fungal	{EC46}, 0159–0163
{EC47}	folding stool <S53>, frame (b) top rail, feathery deposit	2 materials present: ridged compact, shell-like, unidentified fibres of two sizes, Diam 43µm and 7µm, single direction, spiral twist in fibre walls, connecting valves, indicates plant fibres	{EC47}, 0164–0175
{EC48}	folding stool <S53>, layer between frame (b) top rail and bar (biii)	confirmed as skin or leather	{EC48}, 0176–0182
{EC49}	folding stool <S53>, layer between frame (a) top rail and bar (aiii)	plant fibres , Diam 7µm	{EC49}, 0183–0188
{EC50}	folding stool <S53>, on upper stretcher (aii), feathery deposit	3 materials present: ridged, compact, shell-like, unidentified possible plant fibres , Diam 7µm; larger fibres, Diam 60–100µm, more like animal hair than plant fibre, but no scale pattern	{EC50}, 0189–0191
{EC51}	folding stool <S53>, on SE foot of frame (b), coarse fibres	organised structure of plant cells , cell W 12–15µm, spiral structure to cell walls	{EC51}, 0192–0198
{EC52}	iron wall hook <S5>, hair-like fibres on inner curve of hook	plant fibres , Diam 7µm and others 10–15µm, spiral structure to cell walls, valves/pits protruding from them	{EC52}, 0199–0203
{EC53}	comb <S23>, rivet <72>, textile on one end of rivet (<S29> {72 TF1} in Data Table 9)	animal hair fibres , Diam 27–36µm; these have a fibrous cortex but no scale pattern as the outer cuticles have not survived; in cross section the hairs are oval; no evidence of a pigmented medulla. Probably sheep's wool	{EC53}, 0214–0218
{EC54}	comb <S23>, rivet <163>, textile on one end of rivet (<S29> {163 TF2} in Data Table 9)	animal hair fibres , Diam 36µm; evidence of fibrous cortex but no scale pattern; fibres are oval in cross section an similar to {EC53}. Probably sheep's wool	{EC54}, 0219–0224
{EC55}	gaming piece <S59>, <102>	bone-like structure , longitudinal and lateral canals similar to whalebone	{EC55}, 0225–0231
{EC56}	gaming piece <S59>, <139>	bone-like structure , longitudinal and lateral canals similar to whalebone	{EC56}, 0232–0239
{EC57}	die <S60>, <86>	bone-like structure , longitudinal and lateral canals; see {EC43}	{EC57}, 0240–0250

		confirmed as antler	
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Note:
{EC00} SEM samples are numbered on the underside of the stubs
SEM images are in folders 'Samples 1-57'