

# Material Genealogies: Bronze Moulds and their Castings in Later Bronze Age Britain

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## APPENDIX S1. LIST OF BRONZE AGE BRONZE MOULDS FROM BRITAIN

<i>No.</i>	<i>Locality</i>	<i>County</i>	<i>Context</i>	<i>Date*</i>	<i>Matrix</i>	<i>Condition</i>	<i>Exterior decoration</i>	<i>References</i>	<i>Museum (accession no.)</i>
1	Isleham	Cambridgeshire	Hoard	LBA	Palstave	Fragment	No	Britton 1960a; Edwardson 1970; Coombs 1971, fig. 48; O'Connor 1980, 366; Pearce 1984, pl. 12; Taylor 1993, M2:C5 & pl. 70b; Beesley 2004, fig. 9d	West Stow (X21.1)
2	New Street, Cambridge	Cambridgeshire	Single find	LBA	Socketed axe	Both valves	Yes	Fox 1923, 58 & pl. 9; Hodges 1960, pl. 6B	Cambridge MAA (1905.6)
3	Hafod Mountain, Gwernymynydd	Clwyd	Hoard	LBA	Socketed axe	Both valves (fused together)	Yes	Greuter 1989	Flintshire (CLWMS HQA 1989.1/1)
4	Spinkhill	Derbyshire	Dispersed hoard	LBA	Axe	Fragment	Yes	PAS DENO-6C81A3	–
5	White Edge, Froggatt	Derbyshire	Single find	LBA	Socketed axe	One valve	No	<i>East Midlands Archaeological Bulletin</i> 3, 1; Leahy 1977	Derby Silk Mill (471.60)
6	Heathery Burn, Stanhope	Durham	Cave with other artefacts	LBA	Socketed axe	One valve	Knobs only	Society of Antiquaries of London 1864; Greenwell 1894; Greenwell & Clinch 1905; Hodges 1960, pl. 7C; Britton & Longworth 1968; Britton 1971; Schmidt & Burgess 1981, 232 & pl. 95	BM (1911.10-21.9)
7	Wilmington	East Sussex	Hoard	LBA	Socketed axe	Both valves	No	Cooper 1862; Curwen 1954, fig. 59; Hodges 1960, pl. 6A; Coombs 1971, fig. 441	Lewes

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8	Brough on Humber	East Yorkshire	Hoard, with #9	LBA	Socketed axe	Both valves	Yes	Lort 1779, pl. 7; du Noyer 1847, pl. 3; Brailsford 1953, fig. 12 (as 'Quantock Hills'); Hodges 1960, pl. 8A–B (ditto); Schmidt & Burgess 1981, 209, nos 1254 & 1255 (as 'Yorkshire'); Briggs <i>et al.</i> 1987	BM (OA 116 & 117)
9	Brough on Humber	East Yorkshire	Hoard, with #8	LBA	Socketed axe	Both valves	Knobs only	Stukeley 1776, pl. 96; du Noyer 1847, pl. 2; Leahy 1977 (as 'South Wiltshire'); Briggs <i>et al.</i> 1987	BM (T.43.a–b)
10	Hotham Carrs, Hotham	East Yorkshire	Hoard	MBA	Palstave (unlooped)	Both valves	Yes	Society of Antiquaries of London 1873, 426; Evans 1881, 440 & fig. 527; Sheppard 1900; Hodges 1960, pl. 4A; Burgess 1968, fig. 3; Schmidt & Burgess 1981, 169 & pl. 69	BM (WG 1851)
11	Arkesden	Essex	Hoard	LBA	Socketed axe	One valve	No	Clarke 1873; Fox 1923, 324	–
12	Barling	Essex	Dispersed hoard	LBA	Socketed axe	Fragment	Yes	Crowe 2003	–
13	Blackwater valley, near Maldon	Essex	Hoard	LBA	Axe	Fragment	Knob only	PAS ESS-F8865B	–
14	Grays Thurrock	Essex	Hoard	LBA	Socketed axe	Fragment	Yes	Butcher 1922; Coombs 1971, fig. 128; Turner 2010	Colchester
15	Beddington Park	Greater London	Hoard	LBA	Socketed axe	Fragment	Unknown	Anderson 1874, pl. 2; Flower 1874	–
16	'London'	Greater London?	Unknown; provenance uncertain	MBA	Palstave (looped)	Both valves	No	Sheppard 1923; Hodges 1960, pl. 5D	Hull (KINCM:19 80.666.1–2)
17	Southall	Greater London	Hoard	LBA	Socketed axe	Both valves (one broken during recovery)	No	Read 1897; Britton 1960b; Hodges 1960, pl. 7A–B (pl. 7A erroneously labelled as 'Beddington')	BM (1897.4–10.1)
18	Wickham Park, West Wickham	Greater London	Hoard	LBA	Socketed axe	Fragment	No	Anderson 1874, 11; Smith 1958; Hodges 1960, pl. 7D lower	BM (1855.2–27.14)

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19	Deansfield (AKA Danesfield), Glan-Adda, Bangor	Gwynedd	With #20 and one palstave	MBA	Palstave (looped)	Both valves	Yes	Yates 1849; Way 1856; Hodges 1960, pl. 4; RCAHMW 1960, li-iii	One valve in BM (1849,0521.5), other in Cambridge MAA
20	Deansfield	Gwynedd	With #19 and one palstave	MBA	Palstave (unlooped)	Both valves (one broken)	Yes	Yates 1849; Way 1856; Hodges 1960, pl. 4; RCAHMW 1960, li-iii	One valve in BM (1849,0521.5), other in Cambridge MAA
21	Llwyn-mawr, Llanycil	Gwynedd	Single find	LBA	'Late' palstave (looped)	One valve	No	RCAHMW 1921, 148; Hodges 1960, pl. 4B; Bowen & Gresham 1967, fig. 46; Burgess 1968, fig. 5; Leahy 1977	BM (1913.5–28.1)
22	Hayling Island	Hants	Hoard	MBA	Socketed punch	Both valves	Yes	Lawson 1999 & pers. comm.; S. Needham pers. comm.	–
23	Boughton Malherbe	Kent	Hoard, with #24–6	LBA	End-winged axe	One valve	Yes	PAS KENT-15A293; Matthews 2013; Adams 2014, fig. 5	Maidstone (260)
24	Boughton Malherbe	Kent	Hoard, with #23 & 25–6	LBA	End-winged axe	Fragment	Knobs only	PAS KENT-15A293; Matthews 2013	Maidstone (246)
25	Boughton Malherbe	Kent	Hoard, with #23–4 & 26	LBA	End-winged axe	Fragment	Knobs only	PAS KENT-15A293; Matthews 2013	Maidstone (247)
26	Boughton Malherbe	Kent	Hoard, with #23–5	LBA	Axe?	Fragment. Either part of #25 or a different mould	No	–	Maidstone (218)
27	Crundale	Kent	Hoard	LBA	Socketed axe	Fragment	No	PAS KENT-7C3863	Canterbury
28	Isle of Harty	Kent	Hoard, with #29–31	LBA	Socketed gouge	Both valves	No	Society of Antiquaries of London 1873, 424; Evans 1881, 441–6 & fig. 532; Smith 1956; Leahy 1977; Pearce 1984, pl. 15	Ashmolean (AN1927.2507)
29	Isle of Harty	Kent	Hoard, with #28 & 30–1	LBA	Socketed axe	Both valves	Knobs only	Society of Antiquaries of London 1873, 424; Evans 1881, 441–5 & fig. 530; Smith 1956; Leahy 1977; Pearce 1984, pl. 15	Ashmolean (AN1927.2490)

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30	Isle of Harty	Kent	Hoard, with #28-9 & 31	LBA	Socketed axe	Both valves	Knobs only	Society of Antiquaries of London 1873, 424; Evans 1881, 441-5 & fig. 531; Smith 1956; Leahy 1977; Pearce 1984, pl. 15	Ashmolean (AN1927.24 98)	
31	Isle of Harty	Kent	Hoard, with #28-30	LBA	Socketed axe	One valve	No	Society of Antiquaries of London 1873, 424; Evans 1881, 441-5; Smith 1956; Leahy 1977; Pearce 1984, pl. 15	Ashmolean (AN1927.25 01)	
32	Stoke, Hoo	Kent	Hoard	LBA	Axe	Fragment	Yes	Jessup 1930, 108 (as 'Rochester'); Hodges 1960, pl. 7D upper (erroneously labelled as 'Wickham Park'); Maraszek 2007, 440 & pl. 8.27; Turner 2010	BM (1893.2-5.27)	
33	Beacon Hill, Woodhouse	Leicestershire	Single find	LBA	Socketed axe	One valve	No	Clark 1905; Hodges 1960, pl. 6C (as 'Charnwood Forest, Notts.');	Leahy 1977	Charnwood
34	Rothley	Leicestershire	Hoard	LBA	Socketed axe	Both valves	Yes	PAS LEIC-A6BB51	Charnwood	
35	Barnetby le Wold	Lincolnshire	Single find	LBA	Socketed axe	One valve	Yes	North Lincolnshire HER no. 20024	North Lincolnshire (1995:119)	
36	Washingborough Fen	Lincolnshire	Hoard	LBA	Socketed axe	Both valves	Knobs only	Archaeological Institute 1850, xxviii; Archaeological Institute 1861, 166; Davey 1973, 98 & fig. 23; Leahy 1977	Lincoln (10-55)	
37	Beeston Regis	Norfolk	Hoard	LBA	Socketed axe	One valve	No	Lawson 1980; 2013; Taylor 1993, M2:D10	Norwich Castle (1981.79.19)	
38	Harling	Norfolk	Single find	MBA	Palstave (unlooped)	Both valves	Yes	Wymer 1987	Norwich Castle (1986.58)	
39	Hempnall	Norfolk	Found with #40	MBA	Palstave (looped)	Both valves, one broken	Yes	PAS SF-2D55E2	Norwich Castle (2014.16)	
40	Hempnall	Norfolk	Found with #39	MBA	Palstave (looped)	Both valves	Yes	PAS SF-2D55E2	Norwich Castle (2014.16)	

<i>No.</i>	<i>Locality</i>	<i>County</i>	<i>Context</i>	<i>Date*</i>	<i>Matrix</i>	<i>Condition</i>	<i>Exterior decoration</i>	<i>References</i>	<i>Museum (accession no.)</i>
41	Hevingham	Norfolk	Hoard	LBA	Socketed axe	Both valves	No	Lawson 2013; Norfolk HER no. 36973	Norwich Castle (2003.71)
42	North Tuddenham	Norfolk	Hoard	LBA	Axe	Fragment	Yes	PAS NMS2464; Norfolk HER no. 36081	–
43	Oxnead, Brampton	Norfolk	Hoard	LBA	Axe	Fragment	Yes	Norfolk HER no. 24343	–
44	Unthank Road, Norwich	Norfolk	Hoard	LBA	Socketed axe	Both valves	Yes	Society of Antiquaries of London 1829, 424; Archaeological Institute 1851, xxvi; Hodges 1960, pl. 6D; Coombs 1971, fig. 334; Langmaid 1976, fig. 26; Norfolk Museums Service 1977, 35 & fig. 93; Taylor 1993, M2:F12 & pl. 89b	Norwich Castle (1946.161.1)
45	Roseberry Topping	North Yorkshire	Hoard	LBA	Socketed axe	Both valves	No	Ord 1846, 126–8; Evans 1881, 447 (as ‘Cleveland Hills’); Howarth 1899, 86–7; Clark 1905; Elgee 1930, pl. 24; Hodges 1960, pl. 8C; Leahy 1977; Schmidt & Burgess 1981, 243 & pl. 102; Pearce 2006	Weston Park, Sheffield (J93.514)
46	Blewbury	Oxfordshire	Hoard	LBA	Socketed axe	Both valves	Yes	PAS BERK-56BD17	–
47	Sutton Courtenay	Oxfordshire	Single find	MBA	Palstave-chisel	Both valves	Yes	–	BM (1998,0501.1)
48	Oakhurst, Gobowen	Shropshire	With one axe	LBA	Socketed axe	Both valves	No	Shropshire HER no. 04253	Shrewsbury (E.01701.002)
49	Marston	Shropshire	Single find	MBA?	Palstave	One valve	Unknown	Stokes 1995; Shropshire HER no. 30983	–
50	East Pennard	Somerset	Single find	MBA	Socketed spearhead	One valve	Yes	Davis 2006; 2012; Knight <i>et al.</i> 2015, 65, pl. 27, fig. 9	Somerset (TTNCM 63/1994)
51	Arwarton	Suffolk	Single find	LBA	Axe	Fragment	Yes	PAS SF2231	–
52	Levington	Suffolk	Hoard	LBA	Socketed axe	Fragment	Knob only	Coombs 1971, fig. 388; Taylor 1993, M3:B1 & pl. 111a; Pendleton 1999, 208	Ipswich (1961.103)

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53	Sutton	Suffolk	Single find	LBA	Socketed axe	One valve	Knobs only	PAS SF-839555	–
54	Castle Road, Worthing	West Sussex	Single find	LBA	Socketed axe	Both valves	No	Green 1973	Worthing
55	Donhead Clift, Donhead St Mary	Wiltshire	Hoard	LBA	Socketed axe	Both valves	No	Goddard 1912, 138; Passmore 1931; Hodges 1960, pl. 8D; Taylor 1993, M1:G9 & pl. 50	Salisbury (1C5A1 & 1C5A6)
56	'South Wiltshire'	Wiltshire	Unknown	MBA	Palstave (looped)	Both valves	Yes ('cords')	Society of Antiquaries of London 1855; Evans 1881, 440–1; Brailsford 1953, fig. 12; Hodges 1960, pl. 5; Leahy 1977	BM (1855.5–3.1)

Abbreviations: BM = British Museum; HER = Historic Environment Record; LBA = Late Bronze Age; MBA = Middle Bronze Age; PAS = Portable Antiquities Scheme.

\* For moulds found in hoards, date of hoard deposition is given

APPENDIX S2. POSSIBLE LOST MOULD

<i>No.</i>	<i>Locality</i>	<i>County</i>	<i>Context</i>	<i>Date*</i>	<i>Comments</i>
57	Heathery Burn, Stanhope	Durham	Cave, as #5	LBA	A 19th century photograph of objects from the Heathery Burn cave shows a possible second axe mould, now lost (Harding & Young 1986), but the image is too unclear for certainty

APPENDIX S3. SPURIOUS MOULDS

<i>Locality</i>	<i>County</i>	<i>Comments</i>
Carbrooke	Norfolk	A record of a socketed axe mould from Carbrooke (Clinch 1901, 276; Norfolk HER no. 8814) derives from confusion with the mould from Unthank Road, Norwich (A. Lawson pers. comm.)
Stow Bedon	Norfolk	A small bronze fragment is identified in Norfolk HER (no. 55139) as part of a mould, but this seems unlikely on the evidence of the accompanying photograph
Coate	Wiltshire	Initially identified as a possible axe mould fragment (Goddard 1917; Anonymous 1980) but actually a medieval cauldron foot (Wiltshire Museum catalogue no. 1977.08 & L. Brown pers. comm.)

APPENDIX S4. CHEMICAL ANALYSES OF ALLOY COMPOSITION OF MOULDS AND THEIR CASTINGS

<i>No.</i>	<i>Locality</i>	<i>Date*</i>	<i>Object</i>	<i>Cu %</i>	<i>Sn %</i>	<i>Pb %</i>	<i>Reference</i>
1	Isleham	LBA	Palstave mould	?	13.2	6.6	Northover 1982
3	Gwernymynydd	LBA	Socketed axe mould	86.51 82.21	8.83 11.01	3.44 5.68	Needham & Rohl 1998 Needham & Rohl 1998
6	Heathery Burn	LBA	Socketed axe mould	79.7 78	12.4 9.5	7.6 11	Blin-Stoyle 1959 Needham & Rohl 1998
8	Brough on Humber	LBA	Socketed axe mould	85 83.5	11 15.6	3.7 0.75	Needham & Rohl 1998 Needham & Rohl 1998
			Casting	89	8.7	3.1	Needham & Rohl 1998
9	Brough on Humber	LBA	Socketed axe mould	86 84	7.7 7.5	3.5 7.5	Needham & Rohl 1998 Needham & Rohl 1998
			Casting	83	10.6	4.5	Needham & Rohl 1998
10	Hotham Carrs	MBA	Palstave mould	89 87	11.6 11.5	0.15 0.11	Needham & Rohl 1998 Needham & Rohl 1998
			Casting	88	9.7	0.7	Needham & Rohl 1998
17	Southall	LBA	Socketed axe mould	88.6 86 86	8.2 11.6 11.2	3 1.8 1.5	Needham & Rohl 1998 P. Craddock unpublished P. Craddock unpublished
18	Wickham Park	LBA	Socketed axe mould	90	5.1	4.9	Needham and Rohl 1998
19	Deansfield	MBA	Palstave mould	82.5	12.0	2.4	P. Craddock unpublished
20	Deansfield	MBA	Palstave mould	81.5	13.1	2.9	P. Craddock unpublished
32	Stoke	LBA	Axe mould	83	16.6	0.15	Needham & Rohl 1998
37	Beeston Regis	LBA	Socketed axe mould	81.0	10.4	7.4	Lawson 2013

No.	Locality	Date*	Object	Cu %	Sn %	Pb %	Reference
44	Norwich	LBA	Socketed axe mould	86	9.1	5.0	P. Craddock unpublished
				88	5.0	5.2	P. Craddock unpublished
54	Worthing	LBA	Socketed axe mould	?	'about 15%'	?	Green 1973, 87
56	'South Wiltshire'	MBA	Palstave mould	84	15.4	1.2	P. Craddock unpublished
				83.5	14.8	1.0	P. Craddock unpublished

The table lists the copper, tin, and lead content of moulds and implements cast in them; other trace elements are omitted. Where there are two records for a single mould, these relate to readings from the two valves. With the exception of the results published by Blin-Stoyle (1959), Green (1973), and Northover (1982), all analyses were carried out by Paul Craddock of the British Museum with the following methodology. The moulds were sampled by drilling with a size 60 (1 mm diameter) steel bit and typically between 10 and 20 mg of clean turnings were collected for analysis. The analyses were carried out by atomic absorption spectrometry using the methodology described in Hughes *et al.* (1976). The analyses have a precision of  $\pm 2\%$  for the copper, tin, and lead content, and approximately  $\pm 10\text{--}30\%$  for the trace elements, the precision deteriorating as the detection limit was approached. All elements could be detected down to 0.005% in the metal.

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