Metallurgical residues from Taplow
GeoArch Report 2008/02

Dr T.P. Young
GeoArch

Publication text

Summary

The archaeometallurgical residues comprise a small quantity of both macroscopic and microscopic residues from iron-working, apparently of Iron Age date. The macroscopic slags include four small pieces of smithing slag, at least three of which are pieces of small- to medium-sized smithing hearth cakes (SHCs). The micro-residues include fragments of similar slags, slag droplets, flake hammerscale and spheroidal hammerscale. The distribution of contexts yielding these residues appears to be geographically restricted within the site, possibly suggesting locations of iron-working, or possibly just a subset of features contemporary with the iron-working. The very small quantity of residues recovered suggests that actual focus of iron-working lay outside the excavated area.

Material

The macroscopic slags include four pieces of dense iron-slags, each a fragment of a smithing hearth cake (SHC). They show dimpled lower surfaces, indicative of contact with the charcoal fuel. The sample from 1373 is part of a moderately sized plano-convex cake; the fragment weighs 132g and probably indicates an original SHC of approximately 500g. The other three pieces are suggestive of rather smaller cakes. The piece from 1168 (142g) is either a complete, but irregular, hearth slag lump or a fragment of a poorly-developed SHC. The pieces from 1663 and 1725 (56g and 124g respectively) form substantial parts of small plano-convex cakes. The piece from 1373 may be slightly worn, but the other three appear reasonably fresh, so there is no strong evidence for residuality.

The microscopic residues are present in some soil samples very small quantities. Some of the micro-residues, such as flake hammerscale (contexts 1008, 1012, 1132, 1152, 1156, 1163, 1205, 1230, 1243, 1247, 1249, 1252, 1293 and 1297) and spheroidal hammerscale (contexts 1168, 1245, 1247, 1251) can be related directly to iron working. Small, mainly angular, fragments of a dense vesicular grey slag are probably metallurgical (contexts 1008, 1012, 1041, 1152, 1156, 1168, 1249 and 1252) and resemble the macroscopic smithing slags described above, although some fragments may be discrete slag droplets. The samples also contain small fragments and blebs of low-density clinker (contexts 1008, 10481132, 1152, 1156, 1168, 1230, 1249 and 1251) which is not necessarily derived from metallurgical hearths. The clinker blebs, up to 3mm diameter, are of a mid-grey colour, in some cases with a maroon surface tint, and show signs of partial flowage at high viscosity. They probably represent the partial melting of small particles of rock or soil within a hearth and this could be achieved in non-metallurgical hearths.

Distribution

The small-scale of the recovered assemblages suggests that the focus of the iron-working activity has not been located. The distribution of the material recovered from the site is not, however, random. There is a strong geographic structure to the location of the smithing residues:

- Macroscopic slags and micro-residues from smithing occur in a linear array of features (1602, 1724, 1122, 1252, 1203, 1162, 1167, 1156, 1291and 1228) trending SSE-NNW in area 3.

- An arcuate array of small features in area 2 (1242, 1244, 1246, 1248, 1250) all yielded a sparse hammerscale assemblage, and might therefore suggest an activity or structure contemporary with te iron-working. Several larger pits to the south and east of this array (1130, 1150, 1296) also yielded micro-residues and macro-residues (1373).

- Three pits in area 1 (1007, 1011, 1039) yielded micro-residues.

The geographic structuring of the material suggests a coherency in the material assemblage, and given that some of those features are dated as Iron Age, it is likely that the entire assemblage belongs to that period. There may be significance in the restricted distribution of the archaeometallurgical residues, perhaps in terms of contemporaneity, perhaps in terms of site use or process patterns.

Additional notes to supplement the evaluation report (Young 2005)

1. Further revision of the micro-residues resulted in a slight expansion of those contexts yielding hammerscale and other residues from iron-working. A revised matrix of samples, subsamples and residues is presented in the table below, and replaces the listing in the evaluation report.

2. The evaluation report identified a grain from context (1245) as apparently having a bluish inclusion, and it was speculated that this might indicate a speck of Cu-corrosion. During re-examination of all the micro-residues for the final report a further grain from (1245) and another from (1163) were identified with similar colouration. The original grain from (1245) was examined under the scanning electron microscope and the blue material was shown to be a superficial deposit rich in silicon, aluminium and titanium. This composition indicates that the material is a modern paint.

3. The expansion of the list of confirmed archaeometallurgical micro-residues expands the list of contexts concerned, but re-emphasises the striking geographical distribution of the material. However, the locations of any samples which did not include any magnetic material was not supplied with the project materials, so it is important to exclude the possibility that the apparent distribution of residues is actually the distribution of sampling (it is noted that the archaeometallurgical residues came from almost all samples from s1 to s21 – how many other samples were processed but produced negative evidence?).

Reference

YOUNG, T.P. 2005. Metallurgical residues from Taplow. *GeoArch Report 2005/05*. 2pp.

Context	*Fill of...*	*Sample*	*Bag label*			
			magnetic	***magnetic material***	***slag***	***hammerscale***
1008	1007	10	4 pieces of flake hammerscale, 1 piece of clinker	Natural	-	Sub-spheroidal grain, probably a slag droplet
1012	1011	11	1 slag fragment	Natural	6 slag fragments	1 piece flake hammerscale
1041	1039	12	3 slag fragments	Natural	-	natural
1048	1046	7	1 piece probable clinker	Natural	-	-
1132	1130	8	natural	Natural	-	1 piece of flake hammerscale, 1 maroon-surfaced clinkery bleb
1152	1152	1		Natural	3 slag pieces, 6 pieces clinker, 1 burnt organic	1 piece of possible flake hammerscale
1156	1155	2	2 pieces black glassy slag with sand grains, 2 clinker blebs	Natural	2 possible burnt organic fragments	1 piece of possible flake hammerscale
1163	1162	18	1 piece of flake hammerscale	Natural	-	2 pieces of flake hammerscale
1168	1167	3	1 spheroidal hammerscale, 1 piece slag, 2 pieces clinker	Natural	1 piece slag	-
1205	1203	4	1 possible flake hammerscale	Natural	-	-
1230	1228	5	4 pieces of curved flake hammerscale	Natural	1 piece of clinker	-
1234	1233	6	natural	Natural	3 pieces of clinker or burnt organic	-
1243	1242	13	1 flake hammerscale, 1 slag fragment	Natural	-	-
1245	1244	14	Natural	1 spheroidal hammerscale	-	-
1247	1246	15	-	Natural	-	1 spheroidal hammerscale and one piece of flake hammerscale
1249	1248	16	1 flake hammerscale, 1 black glassy slag, 2 clinker blebs	Natural	Burnt organic material, possibly coal	1 piece flake hammerscale
1251	1250	17	1 spheroidal hammerscale, 1 clinker bleb	Natural	2 bone, 2 pieces of clinker	Natural
1252	1122	9	-	1 flake hammerscale, 1 piece of slag	3 pieces of slag	1 possible flake hammerscale piece
1293	1291	20	2 pieces of flake hammerscale	Natural	-	-
1297	1295	19	-	Natural		3 flake hammerscale pieces
1474	1471	21	-		Burnt organics and pottery fragment	-

Summary of archaeometallurgical microresidues from Taplow to replace data in evaluation report. Natural = all grains in sample are or appear to be of natural origin. Where archaeometallurgical residues are present only these are listed. Samples labelled “magnetic” are a coarse fraction, the other three represent picked fine fractions.