Petrological Analysis of Romano-British Tile from Chester Business Park, Chester, Cheshire

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Two Romano-British tiles found in excavations at Chester Business Park were submitted for thin section analysis. The main aim of the study was to establish whether the two tiles were made with similar raw materials and to determine whether thin section analysis could establish the source of the tiles.

Samples of each tile were thin sectioned by Steve Caldwell, University of Manchester, and stained using Dickson's method (Dickson 1965). The thin sections were given the codes V2548 and V2549 and added to the AVAC reference collection (Table 1).

Table 1

TSNO	Action	Sitecode	Context	class	Cname	Form	Fabric
V2548	TS	CBP03	2036	POTTERY	RTIL	IMBR	1
V2549	TS	CBP03	1706	POTTERY	RTIL	BRICK	2

Petrological Description

Fabric 1 (V2548)

The fabric is fine-textured with sparse rounded sand. A sand is also used as moulding sand and is abundant along one edge of the sample. The following inclusion types were noted in thin section:

- Rounded sandstone. Sparse fragments of fine grained sandstone with a high proportion of clay inclusions (a greywacke) up to 1.0mm across
- Organic inclusions? Moderate voids, up to 1.0mm long and 0.2mm wide.
- Clay/Iron concretions. Abundant rounded fragments, some with a concentric structure. These inclusions have an indistinct outline.
- Rounded siltstone. Sparse fragments with a silica matrix up to 0.5mm across.
- Rounded marl. Sparse fragments of cream-firing clay, indicating the former presence of carbonates.

The moulding sand contains abundant well-sorted subangular quartz, c.0.4mm across, some of which is polycrystalline and of sedimentary origin. A few grains are well-rounded.

The groundmass consists of isotropic baked clay minerals, abundant angular quartz up to 0.05mm across and dark brown clay/iron concentrations. The texture and colour indicate that the parent clay had been calcareous with lenses and streaks of dark red/brown coloured and light-coloured (ex-calcareous) clay.

The parent clay was probably the Triassic Mercian Mudstone, or a boulder clay derived from this formation, whilst the moulding sand is also derived from Permian or Triassic sands. The siltstone and sandstone fragments noted in the body of the tile do not seem to be derived from the moulding sand (and there is no rounded quartz in the tile body). Similar fine-grained sedimentary rocks outcrop in the Palaeozoic.

Fabric 2 (V2549)

By contrast with fabric 1, this fabric contains abundant quartzose sand. The following inclusion types were noted in thin section:

- Rounded quartz. Moderate fragments, including one large cracked fragment (original diameter c.2.0mm), mainly c.0.4mm across.
- Rounded chert. Sparse rounded fragments up to 0.5mm across.
- Rounded quartz of metamorphic origin. Sparse fine-grained up to 0.5mm across.
- Rounded sandstone. One large rounded fragment, 2.5mm across, a greywacke with a maximum grain size of 0.5mm.
- Rounded siltstone. Sparse fragments up to 0.5mm across.
- A single large rounded rock fragment consisting of quartz with minor plagioclase feldspar, 2.5mm across.

The groundmass consists of isotropic baked clay minerals, moderate angular quartz and dark brown clay/iron concentrations. The clay's colour and texture indicates that the parent clay was calcareous.

The parent clay was probably the Mercian Mudstone and the sand inclusions are probably derived from Permo-Triassic sands.

Discussion

Both samples were produced from calcareous clays, such as the marls found in the Mercian Mudstone, and contain a rounded quartzose sand, again with little significant difference in their petrological composition. The presence of fine-grained sedimentary rock fragments in both fabrics is possibly due to their being reworked in later deposits (such as the Sherwood

Sandstone) but they probably originated in the Palaeozoic rocks which now outcrop along the Welsh border.

Differences in the groundmass suggest that the two samples are not simply tempered and untempered versions of the same clay, but the amount of variation between the two could easily be found within a single exposure.

Bibliography

Dickson, J. A. D. (1965) "A modified staining technique for carbonates in thin section." *Nature*, 205, 587.