

Ancient Monuments Laboratory
Report 65/93

A PETROLOGICAL NOTE ON THE FABRIC
OF SOME NINETEENTH CENTURY
FIREBRICKS FROM THE DERWENTCOTE
CEMENTATION FURNACE, TYNE AND WEAR

D F Williams PhD FSA

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Summary

A petrological examination was made of several refractory firebricks from Derwentcote cementation furnace, many of them close to vitrification. This was built between 1720 and 1748 and probably had its last firing in the mid 1870's. Two of the firebricks sampled were stamped with different manufacturers names, and the remainder probably also came from a variety of sources. An interesting feature to come out of the examination was that all of the firebricks contained irregular pieces of grog, i.e. crushed up fragments of old firebricks or fired clay. This technique is mentioned in an 1850's treatise on brick and tile making.

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CENTURY FIREBRICKS FROM THE DERWENTCOTE CEMENTATION
FURNACE, TYNE AND WEAR

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A sample from each of the firebricks submitted, from a variety of production centres, was made into a thin section of approximately 30 microns in thickness and then studied under a petrological microscope. Due to the effects of high temperatures on the firebricks, many of the fabrics are close to vitrification and some of them have an almost stoneware appearance, making a detailed examination of the clay matrix somewhat difficult.

[1]. DWF Context no. 674 *From the blocking of a loading hole into the furnace and therefore associated with the final phase of use.*

Thin sectioning shows an isotropic clay matrix which contains a moderate groundmass of silt-sized quartz grains, together with frequent larger subangular grains of quartz generally falling within the size-range 0.20-

60mm. Also present is a little carbonaceous material, siltstone and plentiful irregular-sized argillaceous inclusions.

The latter are probably pieces of grog, i.e. previously fired pieces of clay or old firebricks, etc., which have been deliberately added during the preparation of the clay before the bricks were actually fired. Inclusions of fired clay were often added to firebricks to help with the drying and firing shrinkage of the clay body [Celoria, 1971; Clews, 1953]. Fragments of grog also appear in the other firebricks examined below, showing a similarity of production techniques among the firebrick manufacturers, even though the types of clay used may well have been different.

[2]. DWF Context no. 096 *Stamped BUTE. From post-closure rubble contexts.*

Thin sectioning shows a very fine-textured isotropic clay matrix with some scattered pieces of grog.

[3]. DWF Context no. 1000 *Stamped [RAM]SAY. From post-closure rubble contexts.*

Thin sectioning shows a fine-textured isotropic clay matrix which contains a sparse scatter of silt-sized

quartz grains, frequent irregular-sized inclusions of grog and some pieces of siltstone.

[4]. DWF Context no. 909 *From post-closure rubble contexts.*

Thin sectioning shows an isotropic clay matrix which contains frequent well-sorted subangular quartz grains in the size-range 10-20mm. Also present are several small fragments of siltstone and frequent irregular-sized pieces of grog.

[5]. DWF Context no. 1136 *From post-closure rubble contexts.*

Thin sectioning shows a fine-grained isotropic clay matrix which contains frequent irregular-sized pieces of grog.

[6]. DWF Context no. 210 *Refractory sandstone used for the cementation chests inside the Furnace. From post-closure rubble contexts.*

Fragment of vitrified quartzite sandstone.

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- Clews, F.H. [1953] "Fireclay and alumino-silicate refractories in the 20th century", in A.T. Green and G.H. Stewart [eds.], *Ceramics: a symposium*, British Ceramic Society, Stoke-on-Trent.