

Ancient Monuments Laboratory
Report 60/90

ANALYSIS OF A SAMPLE OF "FULLER'S
EARTH" FROM EASTGATE, BEVERLEY,
NORTH HUMBERSIDE.

Michael P Heyworth

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Summary

A small sample of soil was examined to confirm whether it was fuller's earth, used to scour and cleanse the cloth in the early textile industry. Analyses of both the elemental and mineralogical composition of the soil found no trace of calcium montmorillonite and on this basis the sample cannot be fuller's earth.

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A small sample of soil (AML No. 896917) was submitted for analysis in an attempt to confirm whether it was fuller's earth. The sample came from a pit on a textile production site where dyeing was known to be taking place. Fuller's earth is the name given to a clay which has a high absorptive capacity; its principal clay mineral constituent is usually montmorillonite with calcium as the naturally occurring exchange cation (Deer et al 1966). Most of the fuller's earth in Europe has been produced by weathering of basic igneous rocks, or occurs in a sedimentary product derived from them. The name is also used in England to denote a particular stratigraphical formation. It was used in the early textile industry to scour and cleanse the cloth, as it absorbs the grease and oil contained in the wool.

Initially the soil sample was ground to a fine powder in a pestle and mortar and homogenised. A small sample of ground soil was then analysed by qualitative X-ray fluorescence which detected silica, calcium and iron as the major elements, which are the most common elements in soil. A small sample was then prepared for analysis by infra-red spectroscopy which can detect molecular vibrations at various frequencies which correspond to particular compounds. The resulting spectra was compared with a standard fuller's earth powder and appeared to be quite different. This difference was confirmed by X-ray diffraction analysis which showed the sample be composed of mainly quartz, calcium carbonate and some iron minerals.

As the sample is not calcium montmorillonite it cannot be fuller's earth. Similar XRD analyses of samples of possible fuller's earth from Dyer's Lane, Beverley (Wilthew 1984) came to similar conclusions.

References

Deer, W.A., Howie, R.A. & Zussman, J. 1974 **An Introduction to the Rock Forming Minerals.** Longman Group Ltd, London.

Wilthew, P. 1984 **Analysis of a sample of 'Fuller's earth' from Dyer's lane, Beverley, Yorkshire.** Ancient Monuments Laboratory Report No. 4389.

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