

## **Characterisation of a possible Low Countries import from Wetherby, West Yorkshire**

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A sherd from a red earthenware jug with a thick white slip was recovered from excavations at Wetherby, West Yorkshire. Such vessels, in which the white slip was applied in a plastic state whilst the pot was still on the wheel, leading to spiral markings on the surface of the slip where the underlying red-firing clay has merged with the slip. The technique is characteristic of some low countries redware pottery in the later 13<sup>th</sup> and 14<sup>th</sup> centuries but was subsequently adopted in the Tees Valley (Tees Valley ware) and in southern Scandinavia (South Scandinavian Redware). In both instances it is likely to indicate a movement of potters from the Low Countries.

A sample of the Wetherby vessel was taken for chemical analysis and compared with samples of Tees Valley ware from Hartlepool and various Low Countries products. The latter include shell-tempered vessels from Dover, floor tiles of Flemish type from various English sites (Kingston-upon-Hull, Launceston Castle and York); post-medieval Dutch Red Earthenware from Gateshead, Late medieval Low Countries Greyware from Hartlepool, Jarrow, Gateshead and Scarborough and highly-decorated Low Countries redware (of the type once called Aardenburg ware) from Aardenburg, Ypres (Ieper) and Bruges (the latter from a kiln site).

### **Analysis**

An offcut was taken from the sample and the surfaces removed mechanically. The remaining lump was then crushed to a fine powder and submitted to Royal Holloway College, London, where Inductively Coupled Plasma Spectroscopy was carried out, under the supervision of Dr J N Walsh, Department of Geology. A range of major, minor and trace elements were measured (Appendices 1 and 2). The major elements were measured as percent oxides and the remainder in parts per million.

The percentage of silica was estimated by subtracting the total oxide count from 100%. The estimate, 71%, is at the lower end of the highly decorated Low Countries ware range and close to the mean of the Tees Valley ware samples.

Factor analysis of the dataset revealed five significant factors, accounting in total for 76% of the variation in the data.

A plot of the first two factors, F1 and F2 (Fig 1) reveals three clusters: (1) the Tees Valley ware, (2) the Flemish floor tiles and (3) the remaining samples. Within the latter cluster, the

Wetherby sample plots close to one of the Bruges kiln sites and to a supposed Low Countries greyware from Gateshead (FLEM? in Fig 1).

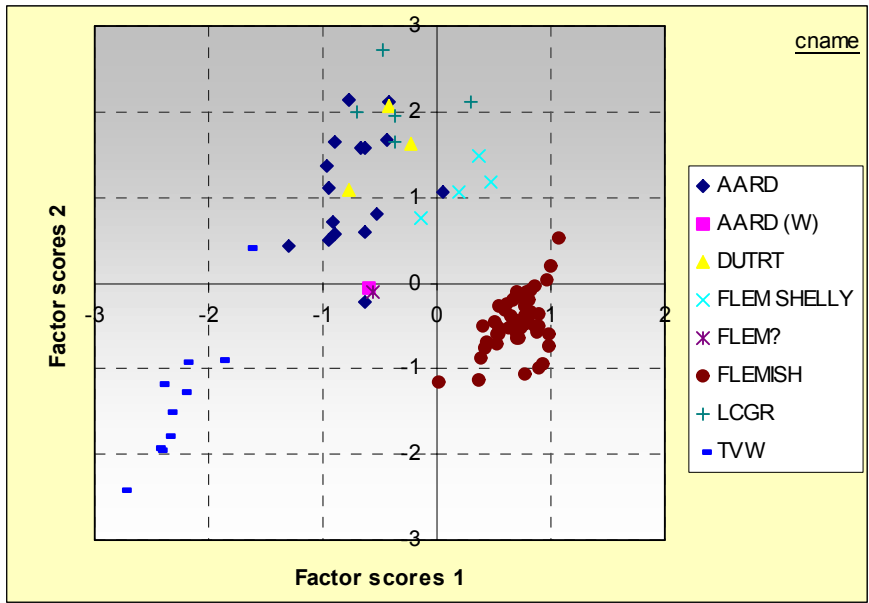


Figure 1

A second factor analysis, just including the data from this third group, indicates that it falls into two main clusters (Fig 2). The first consists of the Flemish shell-tempered ware and the second all the remaining samples. Within that second cluster the post-medieval Dutch Red Earthenware is distinguished by high F2 scores and strong negative F1 scores whilst the remaining samples all have similar F1 scores but have F2 scores with different means. The Low Countries Greyware samples (and the Gateshead “Flemish” greyware) have a higher mean F2 score than the highly decorated ware samples. The Wetherby sample F2 score lies in a part of the plot where the two groups overlap.

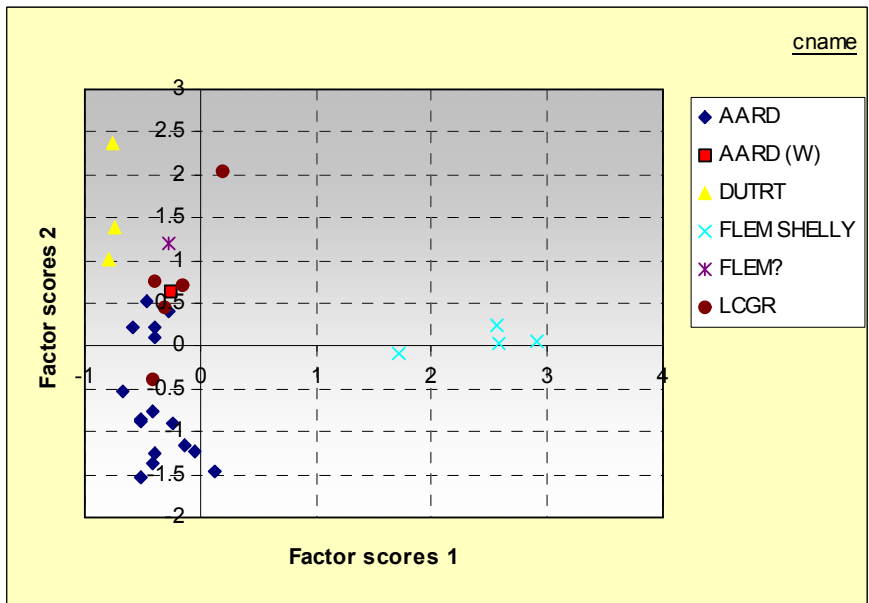


Figure 2

## Conclusion

The chemical analysis of the Wetherby sample is consistent with an origin in present-day Belgium and matches samples from Bruges, Aardenburg and Ypres. A Tees Valley ware source can be ruled out completely.

## Appendix 1

TSNO	Al <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub>	MgO	CaO	Na <sub>2</sub> O	K <sub>2</sub> O	TiO <sub>2</sub>	P <sub>2</sub> O <sub>5</sub>	MnO
V2444	16.29	6.91	1.16	0.52	0.56	2.35	0.79	0.23	0.054

## Appendix 2

TSNO	Ba	Cr	Cu	Li	Ni	Sc	Sr	V	Y	Zr*	La	Ce	Nd	Sm	Eu	Dy	Yb	Pb	Zn	Co
V2444	537	98	28	55	43	15	104	102	17	44	43	98	43	6	1	3.6	1.6	862	88	21