

## Chemical Analysis of a Possible Medieval French Import from Croft Castle, Croft, Herefordshire

Excavations at Croft Castle, Croft, Herefordshire, carried out for the National Trust by Keith Ray and Herefordshire Council, produced a single sherd from a green-glazed whiteware jug. Chemical analysis of this sherd suggests that it is probably English and from the Surrey-Hampshire border.

The sherd comes from the flat base of a vessel with mottled copper-green glaze on the underside (exterior).

### Chemical Analysis

A sample of the sherd was taken and the outer surfaces removed mechanically to minimise the risk of contamination. The remaining sample was crushed to a fine powder and submitted to Royal Holloway College, London, where it was analysed using Inductively-Coupled Plasma Spectroscopy under the supervision of Dr J N Walsh. The results consist of a series of values, expressed as percent oxides, for the major elements (App. 1) and a series of values, expressed as parts per million, for a group of minor and trace elements (App 2). Silica, which was not measured, was estimated by subtracting the total measured oxides from 100%. The various datasets were normalised to Aluminium and then analysed using multivariate statistical routines, using Winstat for Excel ().

The oxide data were compared with material from a variety of localities and potential sources, including both French whitewares and products of the Surrey-Hampshire Border pottery industry (Table 1). Because some of these comparative analyses measured different elements a restricted range of elements was used in the analysis.

*Table 1*

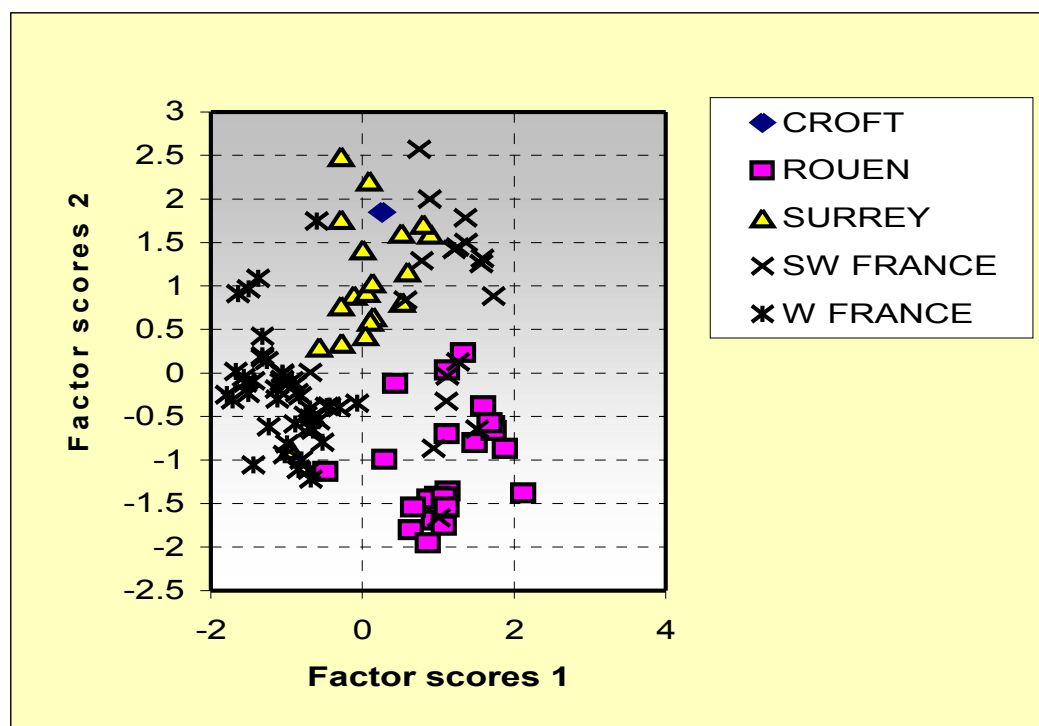
Group	Provenance	Details	References
SURREY	Farnborough	Samples of Tudor Green ware and Borderwares	Pearce 1992
	Wetherby	Sample of Border ware	
SW FRANCE	Ardglass	Sample of unglazed micaceous whiteware of late/early post-medieval date	McCutcheon 2006; McCutcheon. Clare 2006
	Boston	Samples of unglazed and mottled glazed whiteware from late 14 <sup>th</sup> to 15 <sup>th</sup> -century contexts	
	Dublin	Samples of mottled glazed and sgraffito decorated Saintonge ware	
W FRANCE	Various	Samples of glazed whiteware from various sites in the Loire valley, together with Poitiers	2003

### Silica Content

The estimated silica content of the Croft sample is 74.37%. This lies with the range of values found for French whitewares but is lower than that found in the Surrey/Hampshire border industry.

### Factor Analysis

Factor analysis was carried out and a plot of the first two factors was produced (Fig 1). The Croft sample has a positive F1 score, which distinguishes it from the Western French samples, and a high F2 score which distinguishes it from samples from the Rouen area. This leaves Surrey and South-West France as potential sources.



*Figure 1*

None of the other factors distinguished the main groups. The analysis was therefore repeated omitting the Rouen and W French samples. This analysis failed to distinguish the Surrey and SW French samples clearly enough to place the Croft sample conclusively in either group. The data was then examined element by element. This determined that certain elements had very different ranges in the two groups of samples and in these cases the Croft sample was closer in composition to the Surrey wares than to those from SW France. Four of these elements are shown in Figs 2 and 3. In Fig 2 there is little doubt that the Croft sample is closer in composition to post-medieval Surrey whiteware than to SW French wares. In Fig 3 the nickel content of the Croft sample is lower than in any of the Surrey comparanda but the potassium value places it with the Surrey wares, whilst splitting the SW French wares into a low-potassium group and a high potassium group. The high-potassium group is composed mostly of samples from late medieval contexts (Boston and Ardglass) suggesting that there

may have been a difference in composition and perhaps source between SW French whitewares of the 13<sup>th</sup>/14<sup>th</sup> century and the later 14<sup>th</sup> to 16<sup>th</sup> centuries.

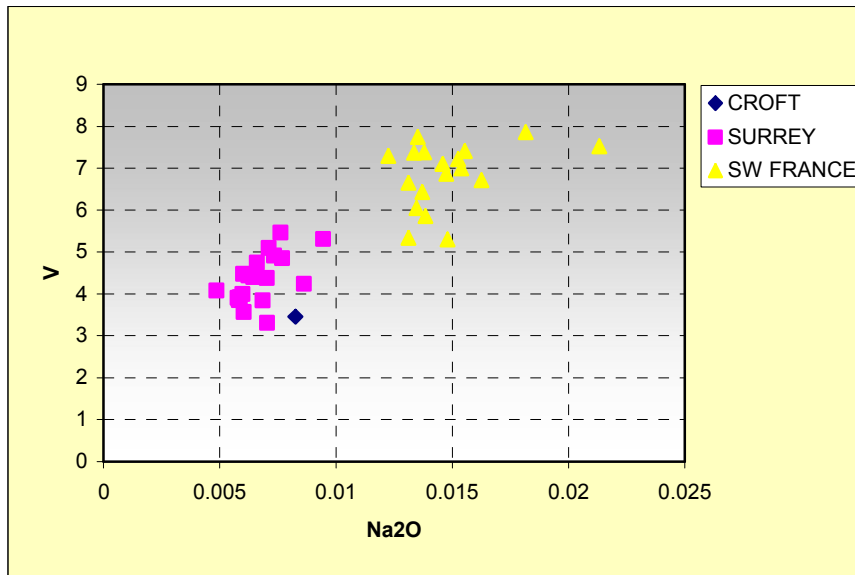


Figure 2

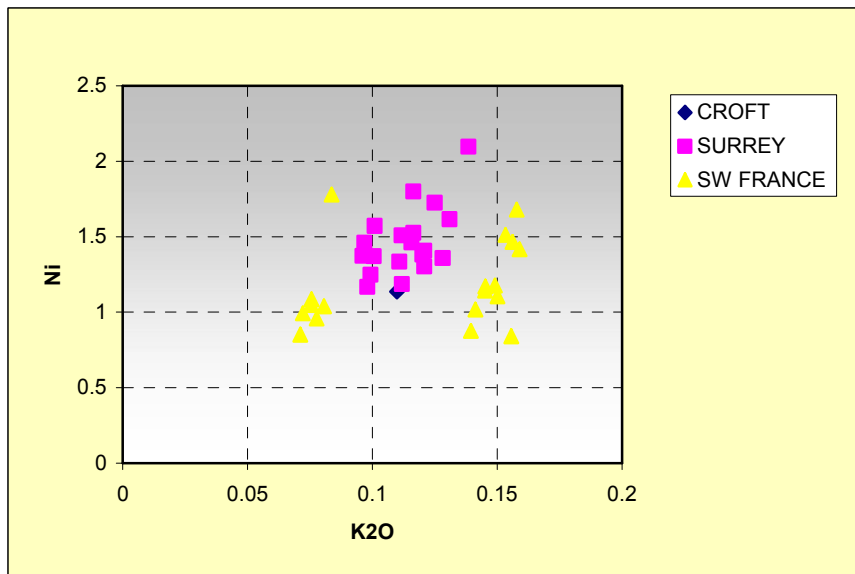


Figure 3

### Conclusions

Chemical analysis suggests that the Croft sample has a similar silica content to that of French medieval whitewares but that it is more similar to samples from the 16<sup>th</sup>-century production site of Farnborough Hill, Surrey.

### 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
V3956	19.38	1.92	0.82	0.38	0.16	2.13	0.73	0.1	0.013

### Appendix 2

TSNO	Ba	Cr	Cu	Li	Ni	Sc	Sr	V	Y	Zr*	La	Ce	Nd	Sm	Eu	Dy	Yb	Pb	Zn	Co
V3956	349	84	21	53	22	13	363	67	12	71	82	115	31	5	1	2	1	268	35	16

## Bibliography

Winstat for Microsoft (r) Excel. Fitch, Robert K. 2001

Husi, P. (2003) La céramique médiévale et moderne du Centre-Ouest de la France (11e-17e siècle) : Chrono-typologie de la céramique et approvisionnement de la vallée de la Loire moyenne, FERAC,

McCutcheon, Clare (2006) Medieval Pottery from Wood Quay, Dublin: The 1974-6 Waterfront Excavations. Series B 7 Dublin, Royal Irish Academy

Pearce, Jacqueline (1992) Border Wares. Post-Medieval Pottery in London, 1500-1700 London, HMSO for Museum of London

McCutcheon. Clare (2006) Medieval Pottery from Wood Quay, Dublin: The 1974-6 Waterfront Excavations. Series B 7 Dublin, Royal Irish Academy