

Characterisation of Late Medieval/Transitional Pottery from Ticknall, Derbyshire

Alan Vince

The late and post-medieval potteries at Ticknall were one of the major sources of blackwares in Midland England (2005). However, its products were made from similar clays to those used in the Staffordshire potteries and it is likely that they are under-recognised by archaeologists.

As part of an on-going historical and archaeological study of the Ticknall potteries, a series of samples from two excavated production sites were selected for characterisation, together with a sample of a vessel from a dissolution period context in Lincoln thought to be a Ticknall product and a sample of a possible Ticknall product of late medieval date from a site at Church Lane, Plungar, in Leicestershire (Table 1).

The samples from Ticknall consist of red earthenware "Cistercian ware" cups and Midlands Purple coarsewares made from poorly-mixed red- and white-firing clays. Various questions were raised by these samples:

- a) Was the Cistercian ware made from the red-firing Coal Measures clay?
- b) Can the products from Site 2 be distinguished from those from Site 6?
- c) Were the Lincoln and Plungar vessels Ticknall products?

Table 1

TSNO	drawing no	Context	cname	Sitecode
V4264	0		MP	PMHF07
V4265	47	1597	MP	glb94
V4266	0		MP	Ticknall Site 6
V4267	0		MP	Ticknall Site 6
V4268	0		MP	Ticknall Site 6
V4269	0		MP	Ticknall Site 6
V4270	0		CSTN	Ticknall Site 6
V4271	0		CSTN	Ticknall Site 6
V4272	0		CSTN	Ticknall Site 6
V4273	0		CSTN	Ticknall Site 6
V4274	0		CSTN	Ticknall Site 6
V4275	0		CSTN	Ticknall Site 2

V4276	0	CSTN	Ticknall Site 2
V4277	0	CSTN	Ticknall Site 2
V4278	0	CSTN	Ticknall Site 2
V4279	0	CSTN	Ticknall Site 2
V4280	0	MP	Ticknall Site 2
V4281	0	MP	Ticknall Site 2
V4282	0	MP	Ticknall Site 2
V4283	0	MP	Ticknall Site 2
V4284	0	MP	Ticknall Site 2

Visual Examination

The Cistercian ware cups have a very fine textured fabric with few inclusions over 0.1mm across visible, even at x20 magnification. Some of the waste was dark grey and vesicular but the intended firing colour appears to have been brick red.

The Midlands Purple vessels, by contrast, have a very poorly mixed fabric and contain lenses and streaks of red- and white-firing clays, together with subangular quartz sand up to 1.0mm across. The red-firing clays appear to be different in texture to the Cistercian ware fabric.

The Lincoln and Plungar samples have fabrics similar to those of the Ticknall Midlands Purple wares although the latter has a red slip, not seen on any of the other samples.

Chemical Analysis

The samples were prepared for chemical analysis by sawing an offcut and then mechanically removing the outer 1.0mm or so. The resulting block was then crushed to a fine powder and submitted to Royal Holloway College, London, where it was analysed under the supervision of Dr J N Walsh.

The frequency of a range of major elements was measured and expressed in percent oxides (App 1) and the frequency of a range of minor and trace elements was measured in parts per million (App 2). The frequency of silica was not measured but was estimated by subtraction of the total oxides from 100%.

Comparison of the estimated silica contents for the various groups (Fig 1) indicates that the two groups of Ticknall Cistercian ware have similar silica contents, both of which have higher means than those of the corresponding Midlands Purple ware samples. The two groups of Midlands Purple ware from Ticknall have different mean estimated silica contents, with that from Site 6 having less silica than that from Site 2. The Lincoln sample, finally, has a higher estimated silica content than that of any of the other samples.

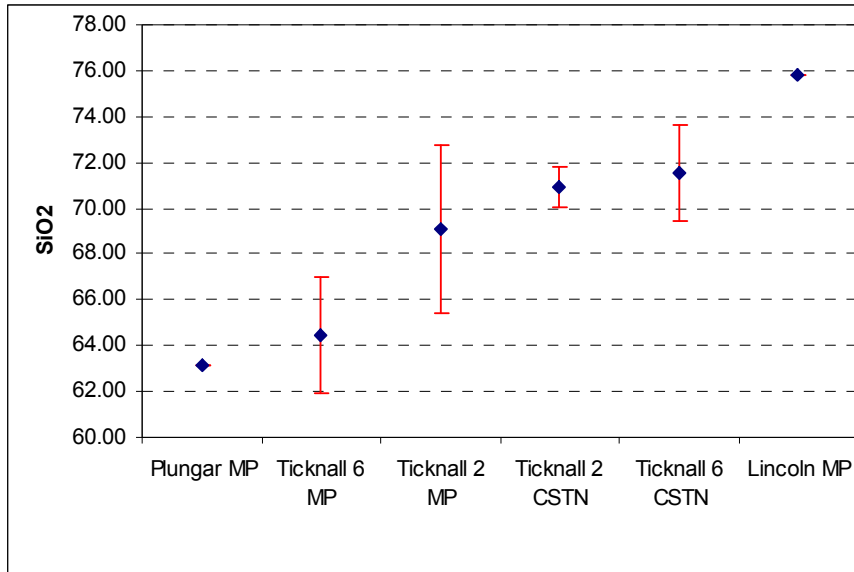


Figure 1

To take account of the dilution factor caused by variations in silica content, which can reflect differences in the parent clay or the use of variable amounts of sand tempering, the element values were normalised to aluminium. The normalised data were then examined using Factor Analysis, a multivariate statistical technique in which the original variables are replaced by a smaller number of factors, each of which is calculated by determining weightings for each element. The proportion of the variability in the dataset which is “explained” by each factor is also calculated. For the Ticknall data and the two comparanda, five factors were found. Between them these account for 79% of the variability in the data (Table 2).

Table 2

Factor	Eigenvalue	Variance (percent)	Percent cumulative
1	8.597185122	31.84142638	31.84142638
2	5.80062452	21.48379452	53.3252209
3	3.614783682	13.38808771	66.71330861
4	1.825219751	6.760073152	73.47338176
5	1.746584826	6.468832688	79.94221445

Factor 1 has high weightings for seven rare earth elements, together with cobalt, titanium and nickel. High F1 scores distinguish all but one of the Site 2 Cistercian ware from the other samples.

Factor 2 has high weightings for potassium, magnesium, sodium, manganese and iron. All the Site 6 Cistercian ware samples have high F2 scores, as does one of the Site 2 samples and one of the Site 2 Midlands Purple ware samples. The remaining samples, mainly the two groups of Ticknall Midlands Purple ware and the comparanda, have low scores for both of these factors.

Factor 3 has high weightings for phosphorus, calcium and strontium, a combination which suggests contamination with calcium phosphate after burial. Only one sample, that from Lincoln, has a high F3 score.

Factor 4 has high weightings for vanadium and scandium and distinguishes all the Ticknall samples and the Lincoln sample from that from Plungar but does not distinguish Site 2 from Site 6 nor Midlands Purple from Cistercian ware samples.

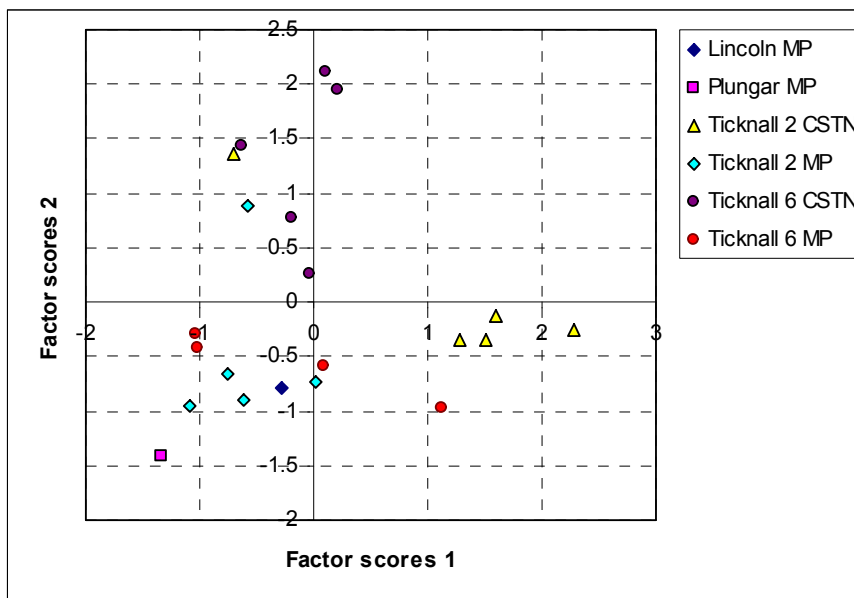


Figure 2

Conclusions

These results suggest that there are chemical differences between the two groups of Cistercian ware and the Midlands Purple ware from Sites 2 and 6. The latter appear to have similar chemical compositions but different amounts of sand temper. One of the Site 2 Cistercian ware samples has a composition which is typical of the Site 6 samples and this may suggest that somehow a waster from Site 6 ended up on Site 2. The two sites are discrete but not far apart.

The difference between the Lincoln Midlands Purple ware and that from Ticknall appears to be solely due to post-burial contamination of the Lincoln sample where as the Plungar sample is actually separated by its Factor 4 score and, as a glance at Fig 2 shows, by its lower F1 and F2 scores. It therefore seems likely that the Lincoln vessel is a Ticknall product but that the Plungar vessel is not. Or, at least, that it was made from raw materials different from those used on Sites 2 and 6.

It is clear that the Cistercian ware was made from a different clay from that used for the Midlands Purple ware which, given the difference in visual texture and colour is not a surprising result. However, the clear difference between the two groups of Cistercian ware

was not expected. This suggests that for finewares such as the Cistercian ware it should be possible to use chemical composition to investigate details of the manufacturing process, such as the production of vessels in batches, as well as being able to determine the site on which vessels were made.

Bibliography

Spavold, J. and Brown, S. (2005) *Ticknall Pots and Potters*, Landmark Publishing,

Appendix 1

TSNO	Al2O3	Fe2O3	MgO	CaO	Na2O	K2O	TiO2	P2O5	MnO
V4264	26.96	5.36	0.83	0.12	0.16	2.38	0.95	0.06	0.018
V4265	15.01	4.45	0.62	1.17	0.12	1.92	0.71	0.2	0.021
V4266	25.89	7.65	1.1	0.18	0.16	2.52	1.22	0.08	0.037
V4267	22.62	6.9	1.13	0.22	0.17	2.92	1	0.09	0.035
V4268	25.71	4.74	1.05	0.18	0.17	2.55	1.15	0.06	0.025
V4269	22.15	4.94	1.23	0.16	0.16	2.87	1.03	0.06	0.032
V4270	16.58	7.14	0.98	0.21	0.16	2.91	0.86	0.06	0.029
V4271	16.95	7.12	1.23	0.23	0.2	3.76	0.76	0.09	0.069
V4272	14.59	6.36	0.73	0.2	0.14	2.22	0.76	0.07	0.016
V4273	15.66	6.41	1.22	0.19	0.32	3.48	0.72	0.08	0.051
V4274	16.67	7.11	1.19	0.15	0.2	3.74	0.79	0.06	0.031
V4275	15.32	6.54	1.09	0.13	0.19	3.45	0.69	0.06	0.03
V4276	19.55	5.22	0.94	0.22	0.13	2.44	1.2	0.04	0.027
V4277	17.38	7.74	0.72	0.15	0.11	1.92	1.13	0.05	0.012
V4278	19.32	5.34	0.92	0.19	0.14	2.31	1.23	0.04	0.024
V4279	19.75	4.6	0.96	0.21	0.15	2.45	1.19	0.05	0.023
V4280	21.72	5.21	0.78	0.12	0.13	2.16	1.02	0.05	0.017
V4281	16.95	5.21	0.68	0.11	0.11	1.8	0.92	0.04	0.016
V4282	20.99	7.23	1.76	0.36	0.18	3.56	0.69	0.06	0.054
V4283	19.25	5.35	0.78	0.23	0.13	2.03	0.93	0.05	0.022
V4284	22.03	7.44	0.86	0.15	0.14	2.13	1.03	0.06	0.033

Appendix 2

TSNO	Ba	Cr	Cu	Li	Ni	Sc	Sr	V	Y	Zr*	La	Ce	Nd	Sm	Eu	Dy	Yb	Pb	Zn	Co
V4264	1,027	118	48	419	42	24	117	160	26	99	64	116	63	8	1	3	3	177	60	13
V4265	730	82	25	200	35	13	333	111	17	61	58	98	57	7	1	3	2	241	36	11
V4266	874	137	69	427	69	28	95	177	48	214	62	115	65	10	2	7	5	277	76	23
V4267	1,307	122	30	289	62	23	144	169	30	116	51	88	52	7	1	4	3	132	59	17
V4268	991	119	81	463	68	26	102	160	56	129	77	144	80	15	3	9	5	121	92	22
V4269	1,239	108	34	262	40	22	101	144	29	93	49	75	50	7	2	4	3	119	51	15
V4270	715	86	23	132	35	17	125	113	24	166	46	78	46	7	1	3	2	158	44	14
V4271	676	77	18	65	37	15	176	111	24	86	46	77	47	8	2	4	3	251	51	13
V4272	530	82	17	87	30	14	94	94	16	54	42	68	42	7	1	2	2	459	40	11
V4273	598	78	20	77	33	16	163	108	21	74	46	81	46	7	1	3	2	470	50	11
V4274	557	76	20	71	25	14	171	108	19	86	44	73	43	5	1	2	2	8,246	50	10
V4275	532	71	25	65	26	13	162	100	16	81	41	73	40	5	1	2	2	4,137	46	11
V4276	490	106	19	249	74	19	71	127	31	81	59	110	60	12	2	5	3	4,236	53	23
V4277	600	97	26	159	51	18	63	117	35	85	56	99	58	10	2	6	3	732	46	17
V4278	639	107	23	257	73	19	71	127	41	97	62	126	65	13	3	7	4	987	51	24
V4279	461	107	20	245	82	20	66	128	29	94	56	97	58	11	2	5	3	13,534	56	24
V4280	773	114	31	300	33	22	88	160	26	99	50	74	51	6	1	4	3	1,301	50	14
V4281	817	86	37	245	37	16	72	108	24	81	45	79	46	7	1	4	2	232	62	15
V4282	829	92	38	148	52	20	106	134	26	68	46	85	47	7	2	4	3	81	72	17
V4283	934	92	40	302	48	18	85	129	22	77	48	76	48	7	1	3	2	381	67	17

The Alan Vince Archaeology Consultancy, 25 West Parade, Lincoln, LN1 1NW

<http://www.postex.demon.co.uk/index.html>

A copy of this report is archived online at

<http://www.avac.uklinux.net/potcat/pdfs/avac2007114.pdf>

V4284 1,415 113 48 301 56 22 86 153 31 96 53 88 54 7 2 4 3 308 93 19