Neutron Activation Analysis of Ceramics from Dominica, Guadeloupe, Martinique, St. Martin, Basse-Terre, St. Lucia, and Ile des Saintes, French West Indies

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November 12, 2008

Introduction

This report describes the reanalysis of the 135 ceramic samples from the islands of Dominica, Guadeloupe, Martinique, St. Martin, Basse-Terre, St. Lucia, and Ile des Saintes, French West Indies previously analyzed at MURR (Descantes and Glascock 2006) and incorporates an additional 37 new samples. The methods involved in neutron activation analysis as well as the background information on the statistical techniques can be found in an earlier report (Descantes and Glascock 2005) and are not repeated here.

Results

Previous analyses of portions of these data did not adjust the elemental concentrations to account for the dilution due to calcium. Calcium values vary from 0.3 to almost 10% with an average of 1.6%. A calcium adjustment would alter the elemental data by an average of 4%, but by as much as 25% for the sample with the highest calcium concentration. We therefore completely re-evaluated the original 135 samples and projected the new 37 samples on those compositional groups. We came to largely the same conclusions as Descantes and Glascock (2005). Following the calcium adjustment, we removed calcium and strontium (which is highly correlated with calcium) from the analysis. Nickel was also eliminated due to a large percentage of the samples with concentrations below the detection limit.

We have identified four compositional groups among the original dataset (Groups 1-4). The addition of the new 37 samples revealed on additional group (Group 6). Group 5 was eliminated and the samples reassigned upon further analysis. Table 1 lists the samples and their new compositional group assignments along with some descriptive information.

The compositional groups are well-separated in principal component space, particularly in a bivariate plot of principal components 1 and 4 (Figure 1). The groups also separate in an elemental bivariate plot of thorium and chromium (Figure 2). The groups are robust when examined by Mahalanobis distance calculations and projections. The first eight principal components account for more than 90% of the variance in the total dataset (Table 2), and thus we used this number of components when calculating probabilities of group membership. This prevented the direct comparison of Group 1 because it does not contain enough samples to satisfy the requirements of the Mahalanobis distance calculations. One word of caution, because we used the complete dataset to calculate the principal components, the values we present here are different than those presented in previous reports where the principal component values were calculated on smaller datasets.

Table 3 lists the probability of group membership for each of the members of the four larger groups (Groups 2, 3, 4, and 6). The strong separation of the groups is shown by very little overlap in membership probabilities. Table 4 lists the probability of membership in the four larger groups for the members of Group 1 and the unassigned samples. There are only a few unassigned samples with noteworthy probabilities of membership in a group, but these samples have high probabilities of membership in

multiple groups. Including them in any of the groups would reduce the statistical separation between the groups.

We have little information as to the specific research questions of interest, other than to compare the new samples to the previous samples. We present tallies of the compositional group members by island, type and form in Tables 5-7, respectively. We encourage you to examine these tables as well as any potential patterns you think might be meaningful. If there are any additional tests or examinations of the data you would like us to do please do not hesitate to ask.

Conclusions

In a reanalysis of 135 samples previously reported as well as the 37 new samples we have found five distinct compositional groups and only 24% of the samples could not be assigned to a compositional group.

Acknowledgements

We thank Magen Coleman and Corinne Rosania for their efforts in preparing and irradiating the samples. Operating support for the MURR Archaeometry Laboratory was provided by a grant from the National Science Foundation (05040155).

References Cited

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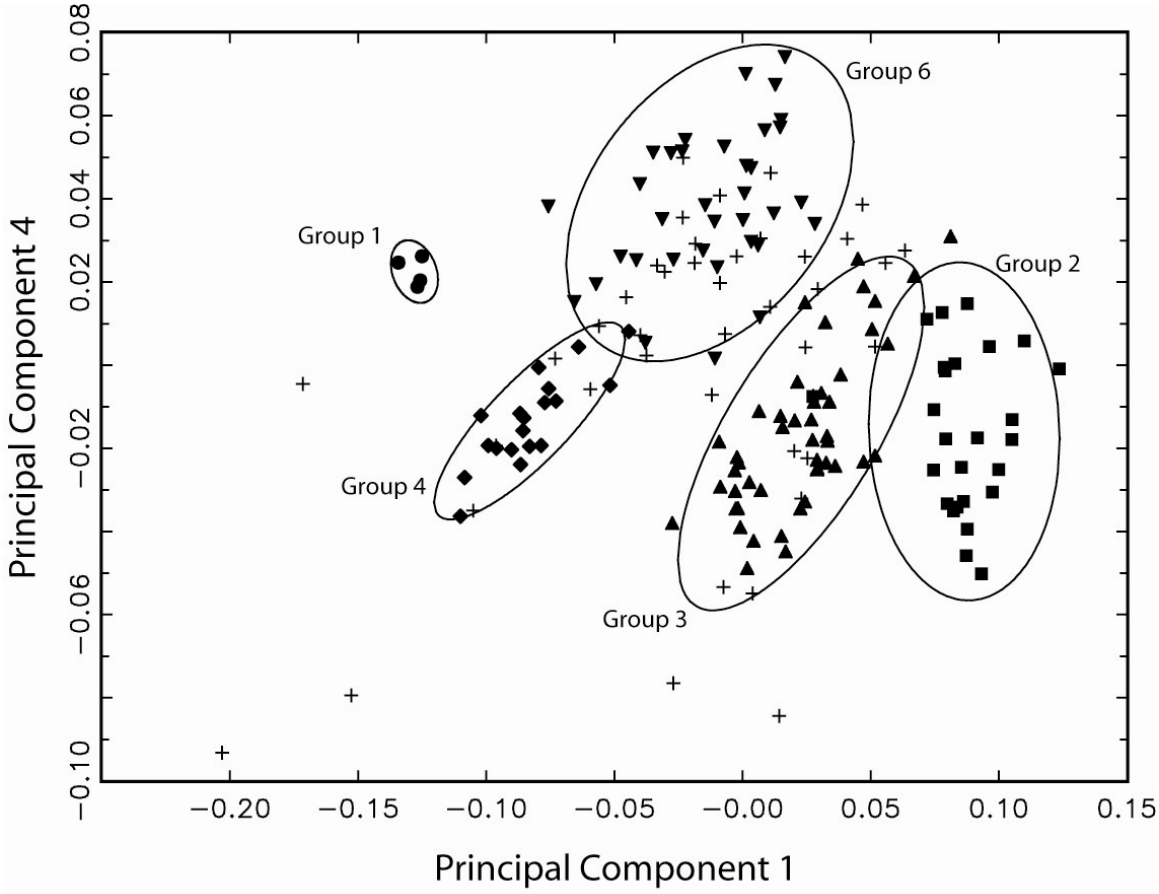


Figure 1: Bivariate plot of principal components 1 and 4 showing the five compositional groups and the unassigned samples (plotted with a "+" symbol). Ellipses represent 90% confidence intervals for membership in the groups.

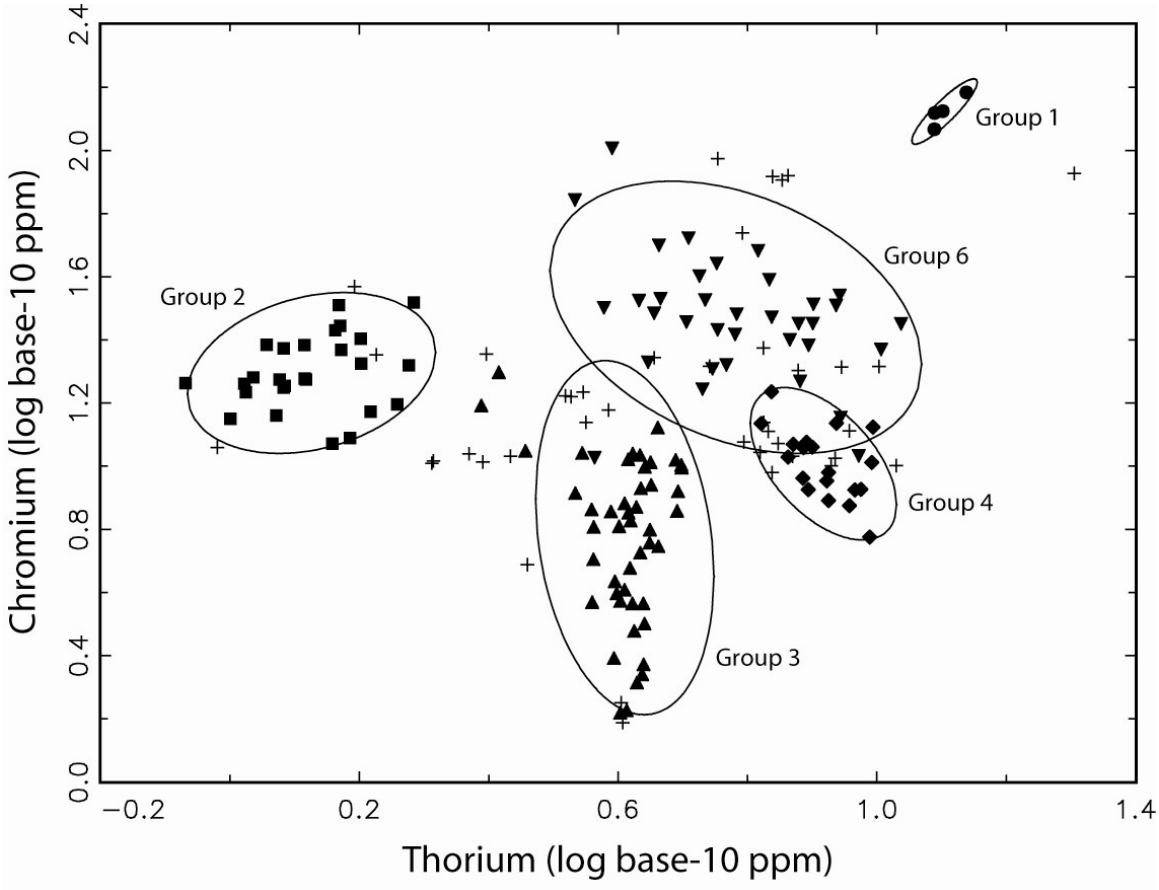


Figure 2: Bivariate plot of thorium and chromium showing the five compositional groups and the unassigned samples (plotted with a "+" symbol). Ellipses represent 90% confidence intervals for membership in the groups

Table 1: Compositional Group assignments and descriptive information.

ANID	Comp. Grp.	Island	Site Name	Type	Form
GUA001	6	Martinique	Point Petite Potterie	Domestic Coil	Pitcher
GUA002	4	Martinique	Point Petite Potterie	Domestic Wheel	Restricted Bowl
GUA003	6	Martinique	Point Petite Potterie	Domestic Coil	Coc au Neg
GUA004	4	Martinique	Point Petite Potterie	Domestic Wheel	Storage
GUA005	3	Basse-Terre, Guadeloupe	Trois Rivier Grand Anse	Domestic Wheel	Pitcher
GUA006	Unas	Basse-Terre, Guadeloupe	Trois Rivier Grand Anse	Industrial	Drip Jar
GUA007	3	Basse-Terre, Guadeloupe	Trois Rivier Grand Anse	Industrial	Drip Jar
GUA008	3	Basse-Terre, Guadeloupe	Trois Rivier Grand Anse	Domestic Coil	Pot
GUA009	3	Basse-Terre, Guadeloupe	Trois Rivier Grand Anse	Domestic Wheel	Storage
GUA010	3	Basse-Terre, Guadeloupe	River Mouth Grand Anse	Industrial	Tile
GUA011	3	Basse-Terre, Guadeloupe	River Mouth Grand Anse	Industrial	Drip Jar
GUA012	3	Basse-Terre, Guadeloupe	River Mouth Grand Anse	Domestic Wheel	Bowl
GUA013	3	Basse-Terre, Guadeloupe	River Mouth Grand Anse	Domestic Wheel	Unkown
GUA014	3	Basse-Terre, Guadeloupe	River Mouth Grand Anse	Domestic Wheel	Storage
GUA015	4	Martinique	Pointe Borgnesse	Industrial	Sugar Cone
GUA016	6	Martinique	Pointe Borgnesse	Industrial	Drip Jar
GUA017	6	Martinique	Pointe Borgnesse	Domestic Wheel	Storage
GUA018	6	Martinique	Pointe Borgnesse	Domestic Wheel	Unkown
GUA019	6	Martinique	Pointe Borgnesse	Domestic Wheel	Pitcher
GUA020	6	Martinique	Morne Cabrit	Industrial	Tile
GUA021	Unas	Martinique	Morne Cabrit	Domestic Coil	Coc au Neg
GUA022	Unas	Martinique	Morne Cabrit	Domestic Wheel	Vase
GUA023	6	Martinique	Morne Cabrit	Domestic Wheel	Vase
GUA024	Unas	Martinique	Morne Cabrit	Domestic Wheel	Pitcher
GUA025	Unas	Martinique	Morne Cabrit	Domestic Coil	Coc au Neg
GUA026	4	Martinique	Trois Ilet	Industrial	Tile
GUA027	Unas	Martinique	Trois Ilet	Industrial	Tile
GUA028	Unas	Martinique	Trois Ilet	Industrial	Tile
GUA029	Unas	Martinique	Trois Ilet	Domestic Wheel	Pitcher
GUA030	3	Ile des Saintes, Guadeloupe	Grand Baie	Domestic Wheel	Pitcher
GUA031	3	Ile des Saintes, Guadeloupe	Grand Baie	Industrial	Drip Jar
GUA032	3	Ile des Saintes, Guadeloupe	Grand Baie	Industrial	Storage
GUA033	3	Ile des Saintes, Guadeloupe	Grand Baie	Industrial	Storage
GUA034	2	Martinique	Macabou	Huecoid	Bowl
GUA035	Unas	Martinique	Macabou	Domestic Coil	Unkown

GUA036	Unas	Martinique	Macabou	Domestic Coil	Unkown
GUA037	Unas	Martinique	Macabou	Industrial	Unkown
GUA038	Unas	St Martin	Colonial de l`Embachure	Domestic Coil	Pot
GUA039	Unas	St Martin	Colonial de l`Embachure	Domestic Coil	Pot
GUA040	Unas	Guadeloupe	Grande Pointe	Domestic Coil	Pot
GUA041	3	Guadeloupe	Grande Pointe	Industrial	Storage
GUA042	3	Guadeloupe	Grande Pointe	Domestic Wheel	Pitcher
GUA043	3	Guadeloupe	La Mahuadiere	Domestic Wheel	Pitcher
GUA044	3	Guadeloupe	La Mahuadiere	Industrial	Storage
GUA045	Unas	Guadeloupe	La Mahuadiere	Domestic Wheel	Unkown
GUA046	3	Guadeloupe	La Mahuadiere	Industrial	Drip Jar
GUA047	Unas	Basse-Terre, Guadeloupe	Rue Dumanoir	Domestic Coil	Pitcher
GUA048	Unas	Basse-Terre, Guadeloupe	Rue Dumanoir	Domestic Coil	Jar
GUA049	3	Basse-Terre, Guadeloupe	Rue Dumanoir	Domestic Wheel	Jar
GUA050	Unas	Grand-Terre, Guadeloupe	Grand Terre Potterie	Industrial	Tile
GUA101	3	Dominica	Capucin, DM	Industrial	Storage
GUA102	3	Dominica	Capucin, DM	Industrial	Storage
GUA103	Unas	Dominica	Capucin, DM	Industrial	Storage
GUA104	Unas	Dominica	Capucin, DM	Domestic Coil	Unkown
GUA105	Unas	Dominica	Capucin, DM	Domestic Coil	Bowl
GUA106	1	Dominica	Woodford Hill, DM	Industrial	Tile
GUA107	2	Dominica	Woodford Hill, DM	Industrial	Storage
GUA108	Unas	Dominica	Woodford Hill, DM	Industrial	Storage
GUA109	3	Dominica	Woodford Hill, DM	Domestic Coil	Pot
GUA110	2	Dominica	Woodford Hill, DM	Domestic Wheel	Pot
GUA111	3	Dominica	Bois Cotlette, DM	Industrial	Storage
GUA112	Unas	Dominica	Bois Cotlette, DM	Industrial	Storage
GUA113	Unas	Dominica	Bois Cotlette, DM	Industrial	Storage
GUA114	4	Dominica	Bois Cotlette, DM	Domestic Wheel	Pitcher
GUA115	4	Dominica	Tartane, DM	Domestic Wheel	Pitcher
GUA116	Unas	Dominica	Tartane, DM	Industrial	Storage
GUA117	Unas	Dominica	Indian River, DM	Domestic Coil	Unkown
GUA118	Unas	Dominica	Indian River, DM	Domestic Coil	Unkown
GUA119	Unas	Dominica	Indian River, DM	Domestic Coil	Unkown
GUA120	6	Dominica	Bois Cotlette, DM	Domestic Coil	Pot
GUA121	1	Dominica	Landoff, DM	Industrial	Tile
GUA122	3	Dominica	Landoff, DM	Domestic Wheel	Pitcher
GUA123	3	Dominica	Landoff, DM	Industrial	Storage
GUA124	1	Dominica	Everton, DM	Industrial	Tile
GUA125	1	Dominica	Everton, DM	Industrial	Tile
GUA126	2	Martinique	Creve Coure, MT	Domestic Wheel	Pitcher
GUA127	Unas	Martinique	Creve Coure, MT	Domestic Wheel	Unkown
GUA128	2	Martinique	Creve Coure, MT	Industrial	Storage
GUA129	4	Martinique	Creve Coure, MT	Industrial	Sugar Cone
GUA130	Unas	Martinique	Creve Coure, MT	Industrial	Tile
GUA131	2	Martinique	Creve Coure, MT	Domestic Coil	Coc au Neg
GUA132	2	Martinique	Creve Coure, MT	Domestic Coil	Coc au Neg
GUA133	2	Martinique	Creve Coure, MT	Domestic Coil	Coc au Neg
GUA134	2	Martinique	Creve Coure, MT	Domestic Coil	Coc au Neg

GUA135	2	Martinique	Creve Coure, MT	Domestic Coil	Coc au Neg
GUA136	2	Martinique	Isle Chancel, MT	Domestic Wheel	Bowl
GUA137	2	Martinique	Isle Chancel, MT	Domestic Wheel	Unkown
GUA138	2	Martinique	Isle Chancel, MT	Domestic Wheel	Bowl
GUA139	2	Martinique	Isle Chancel, MT	Domestic Wheel	Pitcher
GUA140	2	Martinique	Isle Chancel, MT	Domestic Wheel	Pitcher
GUA141	2	Martinique	Isle Chancel, MT	Industrial	Jar
GUA142	2	Martinique	Isle Chancel, MT	Industrial	Sugar Cone
GUA143	2	Martinique	Isle Chancel, MT	Industrial	Sugar Cone
GUA144	2	Martinique	Isle Chancel, MT	Industrial	Sugar Cone
GUA145	2	Martinique	Isle Chancel, MT	Industrial	Storage
GUA146	3	Martinique	Chateau du Buc	Domestic Wheel	Unkown
GUA147	Unas	Martinique	Chateau du Buc	Domestic Wheel	Unkown
GUA148	3	Martinique	Chateau du Buc	Domestic Coil	Unkown
GUA149	Unas	Martinique	Chateau du Buc	Domestic Coil	Unkown
GUA150	3	Guadeloupe	Trois Riviers, GD	Industrial	Jar
GUA151	3	Guadeloupe	Trois Riviers, GD	Industrial	Storage
GUA152	3	Guadeloupe	Trois Riviers, GD	Industrial	Jar
GUA153	3	Guadeloupe	Trois Riviers, GD	Industrial	Storage
GUA154	3	Guadeloupe	Trois Riviers, GD	Industrial	Jar
GUA155	6	Martinique	Pointe Borgnesse	Industrial	Jar
GUA156	4	Martinique	Pointe Borgnesse	Industrial	Jar
GUA157	4	Martinique	Pointe Borgnesse	Industrial	Jar
GUA158	4	Martinique	Pointe Borgnesse	Industrial	Sugar Cone
GUA159	Unas	Martinique	Morne Cabrit	Industrial	Jar
GUA160	Unas	Martinique	Morne Cabrit	Industrial	Jar
GUA161	6	Martinique	Morne Cabrit	Industrial	Jar
GUA162	Unas	Martinique	Morne Cabrit	Industrial	Jar
GUA163	3	Ile des Saintes, Guadeloupe	Grand Baie	Industrial	Sugar Cone
GUA164	3	Ile des Saintes, Guadeloupe	Grand Baie	Industrial	Sugar Cone
GUA165	3	Ile des Saintes, Guadeloupe	Grand Baie	Domestic Wheel	Pitcher
GUA166	3	Ile des Saintes, Guadeloupe	Grand Baie	Domestic Wheel	Pitcher
GUA167	3	Ile des Saintes, Guadeloupe	Grand Baie	Domestic Wheel	Unkown
GUA168	3	Guadeloupe	Grand Anse	Industrial	Storage
GUA169	3	Guadeloupe	Grand Anse	Industrial	Unkown
GUA170	3	Guadeloupe	Grand Anse	Industrial	Unkown
GUA171	4	Martinique	Point Peteit Potterie	Industrial	Unkown
GUA172	4	Martinique	Point Peteit Potterie	Industrial	Storage
GUA173	4	Martinique	Point Peteit Potterie	Industrial	Storage
GUA174	6	Martinique	Point Peteit Potterie	Industrial	Jar
GUA175	3	Martinique	Trois Ilet	Industrial	Sugar Cone
GUA176	3	Martinique	Trois Ilet	Industrial	Storage
GUA177	3	Martinique	Trois Ilet	Industrial	Storage
GUA178	3	Martinique	Trois Ilet	Industrial	Storage
GUA179	3	Martinique	Trois Ilet	Domestic Wheel	Pitcher
GUA180	2	Martinique	Madame Trime	Domestic Coil	Coc au Neg

GUA181	2	Martinique	Madame Trime	Domestic Coil	Coc au Neg
GUA182	2	Martinique	Madame Trime	Domestic Coil	Coc au Neg
GUA183	Unas	Dominica	Toucari, DM	Industrial	Unkown
GUA184	Unas	Dominica	Toucari, DM	Industrial	Unkown
GUA185	Unas	Dominica	Grand Fond, DM	Industrial	Unkown
GUA301	2	Martinique	Creve Coure, MT	Domestic Coil	Coc au Neg
GUA302	2	Martinique	Creve Coure, MT	Domestic Coil	Coc au Neg
GUA303	2	Martinique	Creve Coure, MT	Domestic Coil	Coc au Neg
GUA304	Unas	Martinique	Creve Coure, MT	Domestic Coil	Coc au Neg
GUA305	6	Martinique	Pointe Petite Potterie	Domestic Coil	Pot
GUA306	6	Martinique	Pointe Petite Potterie	Clay	Clay
GUA307	6	Martinique	Pointe Petite Potterie	Industrial	Tile
GUA308	3	Martinique	Pointe Petite Potterie	Industrial	NA
GUA309	4	Martinique	Pointe Petite Potterie	Industrial	Base
GUA310	6	Martinique	Pointe Petite Potterie	Industrial	Drip Jar
GUA311	6	St Lucia	BB02	Domestic Coil	Bowl
GUA312	4	St Lucia	BB02	Domestic Wheel	Bowl
GUA313	6	St Lucia	BB02	Domestic Coil	Tile
GUA314	6	Martinique	Pointe Petite Potterie	Domestic Coil	NA
GUA315	Unas	St Lucia	BB02	Domestic Wheel	Bowl
GUA316	4	St Lucia	BB02	Domestic Wheel	Bowl
GUA317	4	St Lucia	BB02	Domestic Wheel	Bowl
GUA318	4	St Lucia	BB02	Domestic Wheel	Bowl
GUA319	6	St Lucia	BB02	Domestic Coil	Tile
GUA320	6	St Lucia	BB02	Domestic Coil	NA
GUA321	6	St Lucia	BB02	Domestic Coil	Coc au Neg
GUA322	4	St Lucia	BB02	Industrial	Sugar Jar
GUA323	6	St Lucia	BB02	Domestic Coil	Bowl
GUA324	6	St Lucia	BB02	Domestic Coil	Bowl
GUA325	6	St Lucia	BB02	Domestic Coil	Bowl
GUA326	6	St Lucia	BB02	Domestic Coil	Bowl
GUA327	6	St Lucia	BB02	Domestic Coil	Bowl
GUA328	6	St Lucia	BB02	Domestic Coil	NA
GUA329	6	St Lucia	BB02	Domestic Coil	Bowl
GUA330	Unas	St Lucia	BB02	Industrial	Sugar Jar
GUA331	6	St Lucia	BB02	Domestic Coil	Open Bowl Restricted
GUA332	6	St Lucia	BB02	Domestic Coil	Bowl
GUA333	6	St Lucia	BB02	Domestic Coil	Flat
GUA334	6	St Lucia	BB02	Domestic Coil	Open Bowl
GUA335	6	St Lucia	BB02	Domestic Coil	NA
GUA336	6	Dominica	BOISE COTLETTE	Domestic Coil	NA
GUA337	3	Dominica	BOISE COTLETTE	Industrial	NA

Table 2: Variances and eigenvalues for the first ten principal components.

Simultaneous R-Q Factor Analysis Based on Variance-Covariance Matrix

Eigenvalues and Percentage of Variance Explained:

	Eigenvalue	%Variance	Cum. %Var.
1	0.6379	35.6787	35.6787
2	0.3077	17.2107	52.8894
3	0.2120	11.8581	64.7476
4	0.1733	9.6937	74.4413
5	0.1186	6.6335	81.0748
6	0.0712	3.9839	85.0586
7	0.0531	2.9681	88.0268
8	0.0391	2.1858	90.2126
9	0.0350	1.9601	92.1727
10	0.0321	1.7946	93.9673

Eigenvectors (largest to smallest):

As	-0.4475	0.2353	0.0387	-0.2819	0.0540	0.0957	-0.3917	0.4308	-0.0009	-0.2546
La	-0.1714	-0.1918	-0.1778	-0.0633	-0.1441	0.0290	-0.0438	0.0065	-0.0878	-0.0948
Lu	0.0656	-0.1063	-0.2027	-0.1853	0.0524	0.0182	0.0205	-0.1327	0.0010	-0.0954
Nd	-0.1124	-0.1975	-0.2055	-0.1815	-0.0354	0.0833	-0.0046	-0.0594	-0.1056	-0.0292
Sm	-0.0417	-0.1394	-0.2296	-0.1705	-0.0192	0.0446	0.0002	-0.0027	-0.0366	-0.0062
U	-0.1573	0.0025	-0.0734	-0.0076	-0.0733	-0.0816	-0.0914	-0.0689	0.0305	0.0505
Yb	0.0837	-0.1072	-0.2458	-0.2123	0.0731	0.0100	0.0525	-0.1214	-0.0001	-0.1171
Ce	-0.1551	-0.2013	-0.1465	-0.0251	-0.1134	0.1231	-0.0370	-0.0196	-0.0102	-0.0843
Co	0.0961	-0.0560	-0.1880	0.1616	0.0570	0.3517	-0.0418	0.0732	0.3369	0.0332
Cr	-0.0823	0.2610	-0.5401	0.5461	0.1976	-0.1137	0.0041	0.2012	-0.3020	-0.2643
Cs	-0.3739	-0.1148	-0.0157	0.2715	-0.1460	0.1690	0.3359	-0.0135	-0.1424	0.3914
Eu	0.0407	-0.1427	-0.2139	-0.1097	0.0789	0.0809	0.0133	0.0120	-0.2217	-0.0093
Fe	0.0831	0.0905	-0.0951	0.0071	-0.0266	0.0487	-0.0473	-0.0045	0.1936	0.0268
Hf	-0.0887	-0.0214	-0.0279	0.0798	-0.1149	-0.0160	-0.0354	-0.1592	-0.0252	-0.1535
Rb	-0.2573	-0.3717	0.0124	0.1394	0.0953	-0.1234	0.1133	0.2604	-0.0120	0.3440
Sb	-0.4342	0.3843	0.0445	-0.2473	0.3211	0.2769	0.4896	-0.1333	0.1466	-0.0581
Sc	0.1026	0.1777	-0.2028	0.0586	0.0299	0.0185	0.0062	0.0345	0.1619	0.1711
Ta	-0.2278	-0.0716	-0.0292	0.1914	-0.3043	-0.0260	-0.0699	-0.1460	0.2186	-0.2153
Tb	0.0363	-0.1373	-0.2854	-0.1802	0.0282	0.1015	0.1374	-0.1231	0.0174	0.0586
Th	-0.2999	-0.0731	0.0491	0.1722	-0.2972	-0.0221	-0.0361	-0.1579	0.2330	-0.1300
Zn	-0.0687	-0.0007	-0.0804	-0.0745	0.1168	0.2067	-0.3987	0.2398	-0.0621	0.4701
Zr	-0.0696	-0.0231	-0.0650	0.0547	-0.0764	0.0172	-0.0673	-0.1329	-0.0515	-0.1347
Al	0.0223	0.0622	-0.0311	0.0177	-0.0263	-0.0220	-0.0365	0.0060	-0.0310	0.0491
Ba	-0.2116	0.0070	0.0307	0.1204	0.4452	-0.0476	-0.4506	-0.6526	-0.0736	0.1671
Dy	0.0251	-0.0585	-0.3084	-0.2294	0.0274	-0.1360	0.1129	-0.0705	-0.0036	0.0507
K	-0.1534	-0.3737	-0.0182	-0.0313	0.3666	-0.4426	0.0005	0.1860	0.4541	-0.1328
Mn	0.0987	-0.2210	-0.0028	0.0890	-0.0326	0.5950	-0.1778	0.0190	0.1699	-0.1426
Na	0.1038	-0.2833	0.2572	0.2564	0.4437	0.2553	0.1456	0.0522	-0.1062	-0.2795
Ti	0.0266	0.1566	-0.1550	0.1172	-0.0678	-0.0349	-0.0328	-0.0862	0.2879	0.1655
V	0.1226	0.1573	-0.1858	0.1038	0.1173	0.0148	0.0354	0.0497	0.4174	0.1058

Table 3: Probability of Group membership based on a Mahalanobis distance calculation using the first eight principal components.

MAHALANOBIS DISTANCE CALCULATION AND POSTERIOR CLASSIFICATION
FOR TWO OR MORE GROUPS.
Variables used:
Principal components 1-8
Probabilities are jackknifed for specimens included in each group.

The following specimens are in Group 2

	Probabilities:			
ID. NO.	Group 2	Group 3	Group 4	Group 6
GUA034	7.157	0.000	0.000	0.000
GUA107	20.325	0.000	0.000	0.000
GUA110	75.803	0.000	0.000	0.000
GUA126	29.116	0.000	0.000	0.000
GUA128	72.948	0.000	0.000	0.000
GUA131	13.804	0.000	0.000	0.000
GUA132	88.949	0.000	0.000	0.001
GUA133	83.124	0.000	0.000	0.006
GUA134	3.822	0.000	0.000	0.002
GUA135	65.243	0.000	0.000	0.001
GUA136	83.029	0.000	0.000	0.000
GUA137	10.347	0.000	0.000	0.000
GUA138	49.377	0.000	0.000	0.000
GUA139	77.162	0.000	0.000	0.000
GUA140	43.063	0.000	0.000	0.000
GUA141	17.640	0.000	0.000	0.000
GUA142	45.640	0.000	0.000	0.000
GUA143	59.995	0.000	0.000	0.000
GUA144	71.380	0.000	0.000	0.000
GUA145	39.313	0.000	0.000	0.000
GUA180	97.676	0.000	0.000	0.000
GUA181	84.390	0.000	0.000	0.000
GUA182	28.899	0.000	0.000	0.000
GUA301	78.122	0.000	0.000	0.000
GUA302	30.541	0.000	0.000	0.000
GUA303	18.692	0.000	0.000	0.000

The following specimens are Group 3

	Probabilities:			
ID. NO.	Group 2	Group 3	Group 4	Group 6
GUA005	0.000	97.190	0.000	0.000
GUA007	0.000	37.285	0.000	0.025
GUA008	0.001	97.921	0.000	0.091
GUA009	0.000	16.165	0.000	0.000
GUA010	0.009	92.808	0.000	0.095
GUA011	0.000	56.792	0.000	0.000
GUA012	0.000	41.495	0.000	0.000
GUA013	0.000	22.452	0.000	0.028
GUA014	0.000	36.620	0.000	0.000
GUA030	0.000	53.250	0.000	0.000
GUA031	0.000	65.298	0.000	0.000
GUA032	0.000	63.445	0.000	0.000
GUA033	0.000	83.388	0.000	0.000
GUA041	0.000	91.179	0.000	0.000
GUA042	0.000	2.240	0.001	0.062
GUA043	0.000	92.569	0.000	0.000
GUA044	0.000	62.661	0.000	0.000
GUA046	0.000	40.265	0.000	0.000
GUA049	0.000	83.522	0.000	0.003
GUA101	0.000	80.072	0.000	0.001
GUA102	0.000	93.684	0.000	0.001
GUA109	0.000	21.542	0.000	0.000
GUA111	0.000	28.956	0.001	0.000
GUA122	0.000	94.189	0.000	0.000
GUA123	0.000	97.922	0.000	0.000
GUA146	0.528	2.665	0.000	0.396
GUA148	0.285	19.797	0.000	0.034
GUA150	0.000	88.586	0.000	0.000
GUA151	0.000	1.517	0.000	0.006
GUA152	0.001	83.455	0.000	0.023
GUA153	0.000	13.607	0.000	0.000
GUA154	0.030	36.733	0.000	0.095
GUA163	0.000	44.136	0.000	0.000
GUA164	0.000	48.319	0.002	0.009
GUA165	0.001	87.548	0.000	0.008
GUA166	0.000	8.043	0.000	0.042
GUA167	0.004	26.876	0.000	0.047
GUA168	0.008	13.953	0.000	0.056

GUA169	0.000	79.915	0.000	0.001
GUA170	0.001	26.049	0.000	0.817
GUA175	0.000	92.245	0.001	0.004
GUA176	0.002	73.540	0.000	0.113
GUA177	0.000	1.277	0.000	0.004
GUA178	0.000	27.091	0.000	0.000
GUA179	0.000	47.223	0.000	0.041
GUA308	1.882	3.429	0.000	1.036
GUA337	0.000	32.613	0.000	0.000

The following specimens are in Group 4

	Probabilities:			
ID. NO.	Group 2	Group 3	Group 4	Group 6
GUA002	0.000	0.000	3.033	0.001
GUA004	0.000	0.000	75.866	0.097
GUA015	0.000	0.000	17.920	0.066
GUA026	0.000	0.000	7.604	0.002
GUA114	0.000	0.000	43.246	5.194
GUA115	0.000	0.000	7.451	0.067
GUA129	0.000	0.000	32.195	0.057
GUA156	0.000	0.000	96.999	0.077
GUA157	0.000	0.000	80.424	0.010
GUA158	0.000	0.000	25.802	0.101
GUA171	0.000	0.000	17.335	3.083
GUA172	0.000	0.000	63.492	0.383
GUA173	0.000	0.000	95.820	0.808
GUA309	0.000	0.000	67.516	0.868
GUA312	0.000	0.000	99.925	7.146
GUA316	0.000	0.000	63.987	1.435
GUA317	0.000	0.000	58.499	1.054
GUA318	0.000	0.000	35.721	9.555
GUA322	0.000	0.000	28.468	2.795

The following specimens are in Group 6

	Probabilities:			
ID. NO.	Group 2	Group 3	Group 4	Group 6
GUA001	0.003	0.021	0.000	73.734
GUA003	0.002	0.000	0.000	10.900
GUA016	0.000	0.000	0.001	15.208
GUA017	0.033	0.000	0.002	2.016
GUA018	0.000	0.000	1.291	9.738
GUA019	0.000	0.000	0.057	15.343
GUA020	0.000	0.000	0.298	74.190
GUA023	0.000	0.000	0.051	2.911
GUA120	0.002	0.000	0.000	53.235
GUA155	0.000	0.000	0.000	13.930
GUA161	0.000	0.000	0.069	40.051
GUA174	0.000	0.001	0.000	71.775
GUA305	0.001	0.001	0.000	69.314
GUA306	0.012	0.349	0.001	31.852
GUA307	0.002	0.000	0.000	73.781
GUA310	0.001	0.002	0.000	45.564
GUA311	0.001	0.000	0.004	75.480
GUA313	0.000	0.000	0.000	61.187
GUA314	0.009	0.055	0.001	85.189
GUA319	0.000	0.000	0.001	74.769
GUA320	0.000	0.000	0.000	18.513
GUA321	0.000	0.000	0.003	16.388
GUA323	0.000	0.000	0.125	48.653
GUA324	0.005	0.000	0.003	99.112
GUA325	0.000	0.000	0.001	36.483
GUA326	0.013	0.000	0.001	90.116
GUA327	0.000	0.000	0.001	99.191
GUA328	0.003	0.000	0.001	91.013
GUA329	0.000	0.000	0.000	0.672
GUA331	0.000	0.000	0.000	64.668
GUA332	0.001	0.000	0.000	83.713
GUA333	0.000	0.000	0.000	88.646
GUA334	0.000	0.000	0.000	96.086
GUA335	0.001	0.000	0.000	57.370
GUA336	0.004	0.009	0.017	12.131

Summary of Classification Success:

	Into:				
ID. NO.	Group 2	Group 3	Group 4	Group 6	Total
Group 2	26	0	0	0	26
Group 3	0	47	0	0	47
Group 4	0	0	19	0	19
Group 6	0	0	0	35	35
Total	26	47	19	35	127

Table 4: Probability of Group membership based on a Mahalanobis distance projection using the first eight principal components.

MAHALANOBIS DISTANCE CALCULATION FOR MISCELLANEOUS SPECIMENS
PROJECTED AGAINST TWO OR MORE GROUPS.

Variables used:
Principal components 1-8

The following specimens are in Group 1

	Probabilities:			
ID. NO.	Group 2	Group 3	Group 4	Group 6
GUA106	0.000	0.000	0.000	0.000
GUA121	0.000	0.000	0.000	0.002
GUA124	0.000	0.000	0.000	0.000
GUA125	0.000	0.000	0.000	0.000

The following specimens are Unassigned

	Probabilities:			
ID. NO.	Group 2	Group 3	Group 4	Group 6
GUA006	0.000	0.000	0.000	0.000
GUA021	0.000	0.000	0.018	2.454
GUA022	0.000	0.000	0.000	2.002
GUA024	0.000	0.000	0.022	8.485
GUA025	0.000	0.000	30.278	11.336
GUA027	0.000	0.000	0.436	0.001
GUA028	0.000	0.000	10.348	18.108
GUA029	0.000	0.000	0.004	0.174
GUA035	0.000	0.001	0.000	0.753
GUA036	0.004	0.000	0.000	0.000
GUA037	0.000	0.000	0.000	0.001
GUA038	0.103	0.000	0.000	0.009
GUA039	0.052	0.000	0.000	0.002
GUA040	0.004	0.006	0.000	0.107
GUA045	0.000	0.000	0.000	0.000
GUA047	0.001	0.000	0.000	0.002
GUA048	0.059	0.000	0.000	0.000
GUA050	0.000	0.000	0.000	0.018
GUA103	0.000	0.247	0.000	0.000
GUA104	0.023	0.001	0.000	0.004
GUA105	0.000	0.021	0.000	0.116
GUA108	0.248	0.005	0.000	0.001
GUA112	0.003	0.000	0.000	0.002
GUA113	0.000	0.000	6.999	29.592
GUA116	0.002	0.380	0.000	0.004
GUA117	0.506	0.415	0.000	0.427
GUA118	0.013	0.109	0.001	6.616
GUA119	0.043	2.442	0.001	5.048
GUA127	0.000	0.000	0.000	0.000
GUA130	0.000	0.000	46.852	34.507
GUA147	0.000	0.000	0.000	0.000
GUA149	0.000	0.000	0.000	0.000
GUA159	0.000	0.000	0.003	0.843
GUA160	0.000	0.000	0.086	0.417
GUA162	0.000	0.000	0.002	1.387
GUA183	0.000	0.005	0.000	0.835
GUA184	0.449	0.561	0.000	0.041
GUA185	0.000	0.000	0.000	0.042
GUA304	3.144	0.000	0.000	0.513
GUA315	0.000	0.000	4.908	4.512
GUA330	0.000	0.000	0.415	14.406

Table 5: Tally of compositional group by island.

Island	1	2	3	4	6	Unassigned	total
Basse-Terre Guadeloupe			10			3	13
Ile de Saintes Guadeloupe			9				9
Guadeloupe			13			2	15
Dominica	4	2	7	2	2	14	31
Martinique		24	8	12	16	18	78
St. Lucia				5	17	2	24
St. Martin						2	2
total	4	26	47	19	35	41	172

Table 6: Tally of compositional group by type.

Type	1	2	3	4	6	Unassigned	total
Clay					1		1
Domestic Coil		11	3		23	16	53
Domestic Wheel		7	15	8	4	7	41
Huecoid		1					1
Industrial	4	7	29	11	7	18	76
total	4	26	47	19	35	41	172

Table 7: Tally of compositional group by form.

Form	1	2	3	4	6	Unassigned	total
Sugar Cone		3	3	3			9
Sugar Jar				1		1	2
Storage		3	16	3	1	5	28
Base				1			1
Bowl		3	1	4	7	2	17
tile	4		1	1	4	4	14
Clay					1		1
Vase					1	1	2
Coc au Neg		11			2	3	16
Drip Jar			4		2	1	7
flat					1		1
Jar		1	4	2	3	4	14
Unknown		1	6	1	1	14	23
NA			2		5		7
Open Bowl					2		2
Pitcher		3	8	2	2	3	18
Pot		1	2		2	3	8
Restricted Bowl				1	1		2
total	4	26	47	19	35	41	172