ASPECTS OF PREHISTORIC POTTERY-MAKING IN ORKNEY

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INTRODUCTION

It is not too much of an exaggeration to claim that during the last decade and a half, the application of petrological analysis has revolutionized the approach to prehistoric pottery studies. Previous to this, pioneering petrological work in Germany (Buttler, 1935; Obenauer,1936; Schmitt,1939) and America (Shepherd,1942) during the 1930's and 1940's had demonstrated the importance of analyzing and classifying pottery pastes in differentiating locally-made from imported prehistoric pottery, although the wide-spread implications of these results were not fully appreciated at the time. Until fairly recently, many prehistorians have given the study of pottery fabrics a low priority, regarding pottery as essentially the product of each community. Instead, emphasis was given to typological nuances for providing a means for formulating cultural zones, and for supplying evidence for the introduction of fresh settlers (Hawkes,1959). However, this latter view has had to be somewhat modified as a result of David Peacock's (1968; 1969a; 1969b) petrological work on Neolithic and Iron Age wares from the west Midlands and south-west Britain, where production by specialist potters on a relatively large-scale appears to be indicated (for an alternative view of Glastonbury ware see Blackmor Braithwaite and Hodder,1979; and Peacock's cogent reply,1979).

It is easy to understand the growth of thin section analysis in pottery studies, since the method can often provide a quick, relatively inexpensive means of establishing: (a) origin, (b) comparability with

similar material of known origin, and (c) the technology involved. Any one of which may provide valuable information on both dating and movement of pottery. In particular, the ability of the petrological method to identify local and imported pottery in a given area can be of the utmost value for establishing contact between various communities. It is true to say that in the past the emphasis in petrological work on prehistoric pottery has been placed in this direction. Analysis by Hays and Hassan (1974) of Sudenese Neolithic pottery, for example, showed that the decorative 'Khartoum horizon style' motif which was common to a large part of the country, was in fact produced separately by several communities each with their own distinctive fabric, thereby indicating a degree of typological cohesion over a wide area.

Another way of identifying cultural connections by way of pottery is in the recognition of similar distinctive technological traits. In reality, the choice and preparation of materials used for prehistoric pottery are probably a stronger reflection of tradition and culture than are form and decoration, which may merely represent local copying of a 'traded' item. In other words, we should be as interested in why particular materials were chosen as in identifying their source of origin.

Only relatively few clays need very little preparation before use, the gabbroic clay of the Lizard seems to be a case in point, and this may have been one reason for its continued use on a fairly large scale from the Neolithic to Late Roman times. The majority of clays are too 'fat' to be used on their own, and an aplastic material or 'temper' has to be added to the clay to reduce its plasticity and make it more easy to manipulate. The addition of a temper also helps to open up the body of the clay to release water for a speady drying, to better control the distribution of heat and to prevent undue shrinkage during firing.

The range of materials used as tempers by prehistoric potters is

very wide. Undoubtedly many tempers were used because they were the nearest suitable material to hand, and in some modern case-studies they seem to have been selected in a haphazard way (Fontana et al, 1962). However, there are an increasing number of examples where the choice of a particular prehistoric temper was made for what appears to have been reasons of 'tradition' or for technological considerations. A study of the added temper in early Scandinavian pottery has shown that once established, manufacturing techniques tend to remain fairly stable over long periods, and that the appearance of new methods are usually associated with the movement of fresh cultures into the area (Hulthen,1976). A similar situation may be seen regarding the problems of continuity between Neolithic and Bronze Age pottery in Britain. On the whole, it is apparent that much late Neolithic ware contains inclusions such as quartz, flint and shell. In contrast, Peacock (1970) has drawn attention to the presence in the primary series of Bronze Age collard urns of large quantities of grog (crushed up pottery). This form of tempering is commonly found in Bronze Age beaker pottery, and it is clear that this was being copied by the Collard Urn potters, implying some degree of technological change at this time. The deliberate choice of grog as an additive may have been partly due to the fact that its thermal characteristics would be the same as the clay matrix of the vessel being fired - perhaps repeatedly if used for cooking purposes. From this examination it now appears that the Beaker influence during the early Bronze Age was probably more important than was first thought, since Beaker decorative details were rarely copied on collard urns.

PREHISTORIC POTTERY FROM ORKNEY

During the past few years, Neolithic and Iron Age pottery from a number of sites in Orkney has been systematically thin sectioned

as part of a programme for the petrological examination of Orcadian pottery. Neolithic grooved ware and associated undecorated pottery has been sectioned from the settlement sites of Skara Brae (74 sherds) and Rinyo (28 sherds), the henge site at Stones of Stenness (15 sherds - Williams,1976) and the cairn at Quanterness (29 sherds - Williams,1979); Neolithic Unstan ware from Knap of Howar, Papa Westray (11 sherds); and Iron Age pottery from the Roundhouse at Quanterness (9 sherds - Williams,1979) and the broch at Bu of Stromness (12 sherds). One interesting aspect of the results so-far, is the possibility of a 'technological recipe' for making pottery that appears to have been fairly widespread during the Neolithic and perhaps also the Iron Age periods of Orkney.

If we look firstly at the grooved ware and associated pottery from the Neolithic settlements of Skara Brae on the Mainland and Rinyo on Rousay, we find that of the one hundred-odd sherds sampled, the majority contain fragments of dyke rock (mainly camptonite and some bostonite, with the odd-sherd containing monchiquite and olivine-basalt), together with one or more other non-plastic inclusions: sandstone, quartz, siltstone, mudstone, limestone, calcite and shell. Both sites are situated fairly close to deposits of Boulder Clay, and it is possible, therefore, that this range of inclusions could simply be due to the vagaries of the drift. However, examination of the sherds under the binocular microscope shows that the fragments of dyke rock are sharply angular. If this dyke material was derived from the drift, evidence of some rounding of the fragments might be expected, together with a greater variety of inclusions in each sample, and this is lacking. Furthermore, the frequent occurrence of camptonite in the pottery from both sites seems to be much more common than one would expect if this was just drift material, given the fairly limited outcrops of camptonite dykes in Orkney (Mykura,1976,Fig. 25).

On the face of it, the angular fragments of lamprophyric rocks found in the pottery from Skara Brae and Rinyo suggest the deliberate choice of crushed dyke rock for use as a tempering medium. It is probable, therefore, that the clay and temper were derived from different sources.

Skara Brae is situated very close to a camptonite dyke, and such material would thus be easily accessible; isolated dykes of bostonite and monchiquite occur within a $1\frac{1}{2}$ - 2 mile radius of the site. Rinyo is at least two miles away from the nearest known camptonite dyke in the area, and so this material would presumably have had to be deliberately sought out for its use in local pottery-making. In this connection it is interesting to compare the petrological results of the grooved ware from the henge site at the Stones of Stenness (Williams,1976) and from the cairn at Quanterness (Williams, 1979). At Stenness six out of fifteen sherds analyzed contained camptonite, while at Quanterness just under half of the twenty-nine vessels examined contained dyke material: camptonite, bostonite, monchiquite and olivine-basalt. Isolated dykes of camptonite occur within a two-mile radius of both sites, monchiquite as well in the case of Quanterness, but not bostonite and olivine-basalt.

Altogether some 65% of grooved ware and associated vessels from the settlement sites of Skara Brae and Rinyo, the cairn at Quanterness and the henge monument at Stenness contain some form of dyke material (mainly camptonite). However, only in the case of Skara Brae is there a camptonite dyke situated in close proximity to the finds of pottery. At first sight this might seem to suggest some form of centralized production, closeby to easily available dyke material. It is noticeable, however, that the aplastic non-dyke inclusions in the sherds examined are extremely variable, consisting of one or more of sandstone, shell, quartz, siltstone, mudstone, limestone and

calcite. Taking this into account, a single centre for much of this pottery appears unlikely, indeed it is significant that the Rinyo sherds lack the limestone/calcite fragments which are common, though usually only in small amounts, in the Skara Brae pottery. Likewise, there seem to be significant differences in the fabric (minus the dyke material) when comparing Groups 2 and 4 at Quanterness (both containing prominant inclusions of camptonite or bostonite) and Group 2 at Stenness (camptonite), with similarily tempered pottery from Skara Brae and Rinyo.

If the correct interpretation has been made regarding clay and temper, then the apparent differences in the fabric (minus dyke material) of the pottery from Skara Brae and Rinyo, might suggest that a number of local potters at these sites were choosing their own particular clay sources, but often adding a crushed dyke rock (mainly camptonite) to the clay. What we are seeing may be a tradition of making pottery in a special way by the addition of crushed dyke rock that was fairly widespread over the Orkneys. Perhaps dyke rock was chosen because of its fairly low thermal expansion (mainly felspar/hornblende - see Skinner,1966), an important factor if pottery was used for cooking purposes and subjected to rapid expansion and contraction.

This hypothesis would call for a fair measure of contact between the various late Neolithic settlements in Orkney. On this point it may be significant that Unstan ware pottery, usually considered to be of the earlier Neolithic period (Renfrew,1979), has also been found to contain dyke rock fragments during analysis carried out in the 1940's (Phemister,1942). However, no dyke material was found by the writer in the Unstan ware pottery from Knap of Howar, Papa Westray, although in this case there are no dykes listed for the island.

The above evidence may tentatively point to a certain tradition of pottery-making which was common both to the 'Unstan ware People' and the 'Grooved ware People'. This view would appear to support the

idea of a transition from one ware to another, with the tradition of a particular type of temper used passed on, rather than envisiging both groups of people existing at the same time, sharing a deliberate element of pottery-making, but producing quite different wares. Following on from this it may also lend supporting evidence for regarding the 'Grooved ware People' as indigenous rather than intrusive to Orkney.

There is some evidence for the continuation into the Iron Age of using dyke rock as a tempering agency. At both the Bu broch and the roundhouse at Quanterness, the majority of sherds sectioned contained fragments of dyke rock. However, the sampling at both sites was small and more pottery from other Iron Age sites needs to be examined before any firm conclusions can be reached.

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