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The Social Life of Clay: A Metaphysical Characterisation of Ceramics through Petrographic Analysis

Imogen Wood

Introduction

Clay is not generally considered part of material culture until it is formed into an object. To many, it is a material awaiting culture. This paper challenges archaeologists to recognise the potential social importance behind the choice of clays in the past and that a more theoretically informed interpretation of petrographic data can reveal not just technological but social choices in production. It draws on ethnographic examples demonstrate these points.

Moreover, the paper is built on the premise that petrological data is under-utilised in archaeological interpretation. This is by no means the first time this data has been used to address broader social questions within archaeology. For example, Alan Vince and Andy Jones have attempted something similar. The analyses undertaken by Vince on Anglo-Saxon pottery from the Thames Valley found that the fabrics did not correspond with known or assumed socio-political units, but that Late Saxon pottery fabric traditions related directly to the boundary with the Danelaw (Vince 2005, 228). Jones' work at Barnhouse in Orkney on the fabric composition of Neolithic pottery is another example: he highlighted that petrological analysis is often undertaken but the results are rarely integrated into the interpretation of a site and its wider context (Jones 2002, 51). For instance, in Neolithic Orkney the petrological analysis of pottery and stone receives a brief mention in the final report, stating only that they are 'locally derived'. In addition, Jones has emphasised the need for a symmetrical form of analysis that:

> *'focuses not only on the description and characterization of the material properties of artefacts (the traditional preserve of archaeometry), but also on how those material properties intervene in the social lives of people (the traditional concern of theoretical archaeology).'*
>
> Jones 2004, 335.

This paper addresses that need through a re-assessment of gabbroic pottery in the south-west of England.

The gabbroic hypothesis

The analysis undertaken by the author builds upon the pioneering petrological work of David Peacock. In the 1960s, his work on gabbroic Cornish ceramics identified a specific clay source and clearly demonstrated the potential of petrological analysis to provenance pottery (Peacock 1967; 1969a; 1969b; 1969c; 1988). His analysis of Neolithic and Iron Age pottery in the south-west peninsula revealed that local potters were utilising particular and distinctive clays derived from an outcrop of gabbro stone on the Lizard Peninsula in Cornwall (Peacock 1969a, 44-5). It has since been established that these gabbroic clays were sought out and used in pottery production for over 5000 years.

In hand specimen gabbroic pottery is distinguished by frequent off-white or yellow oblong flecks of plagioclase feldspar giving it a distinctive look, similar to a 'hobnob' biscuit. Microscopic analyses show an abundance of plagioclase feldspar with the addition of occasional quartz, pyroxenes and rare hornblende, with accessory minerals such as serpentine and olivine. The gabbro forms part of a mafic geological formation – and here a section of oceanic crust was pushed up and over part of the Continental plate (an ophiolite) – that is very uncommon in lowland England. Discoveries of unfired gabbroic clay on several sites suggest the clay, and not the pots, were transported (Wood 2011).

The analytical and interpretive potential of this mineral distinctiveness was quickly recognised. Vince (2005, 220) commented that gabbroic clay is one of the very few to meet the stringent requirements of petrological characterisation due to the particularly distinctive suite of derived minerals it contains. Neolithic gabbroic pottery has been found as far afield as Hembury (Devon), Maiden Castle (Dorset) and Windmill Hill (Wiltshire), and has been interpreted to indicate the existence of an extensive associated trade network (Anderson 1984, 121). Over the past fifty years research by Henrietta Quinnell has shown that there are diachronic changes in gabbroic pottery fabrics and that the clay was often mixed with clays local to the producer settlements (Quinnell and Jones 2011, 203; Quinnell & Taylor, this volume). The preferential use of this clay, a tradition that spanned millennia, has been ascribed to its superior technical properties (Peacock 1969a; Harrad 2003).

To date, most research on gabbroic pottery has focused on provenancing, expanding on models of trade and distribution, and reiterating its technical superiority. The most comprehensive recent work was undertaken by Lucy Harrad (2003, 47) who combined a programme of clay sampling with chemical and petrological analyses to investigate how gabbroic pottery was produced and traded. She pinpointed a precise provenance within the gabbroic source area near the village of St. Keverne, and concluded that its preferential selection was due

to its technical performance (Harrad 2003, 284). This may well be true, but this conclusion has overshadowed alternative avenues of interpretation.

The analysis of, and emphasis on, gabbroic pottery has also overshadowed the use of local clays. Stephanie Sofranoff (1981) and Elaine Morris (1980) have challenged the perceived dominance of gabbroic clay usage and highlighted that clay sources which were local to sites were also utilised. This point is often overlooked in current reports, although it is clear that an understanding of why non-gabbroic clays were used offers greater insight into the social significance of the gabbroic clay and its role in society.

Theoretical perspectives

In order to explore the social context of clay procurement, this paper utilises theoretical perspectives focused on the concepts of materiality, the 'life-world' principle, and socialised landscapes. As we shall see, these concepts can be related to the archaeological examples and ethnographic analogies. Over the past forty years, ethnographic studies of ceramics have comprehensively established that pottery production is informed by every aspect of daily life and not solely driven by the performative attributes of clays (Arnold *et al.* 1991). Work by the author on gabbroic clay sourcing practices in Cornwall will demonstrate how theoretically informed petrographic analysis can elucidate the social motivation and possible meanings inherent to the act of clay sourcing.

Ethnographic analogy

Traditionally, archaeologists have seen the sourcing of clay as being linked to the local geology, available transportation, its intended use, and how it is formed. An overlooked distinction is that a source of clay is an objective phrase defined purely on geological location and mineralogical constituents, whilst a clay source infers an active relationship with people through its extraction and exploitation. There is rarely any consideration of the social choices in this part of the production process. Ethnographic research, in contrast, has devoted far more attention to the social motivation and context of pottery production. For example, Arnold *et al.* have shown *'pottery thus encodes both chemical information from the source and behavioural information from the pott*er' (1991, 88).

Similarly, Gosselain (1998; 2000; 2008) and Gosselain & Livingstone-Smith (2005) have emphasised that study of clay procurement and selection should take into account

> *'the multiple facets of the potters' social identity, historical processes that effect the area in the recent and more distant past, and the movements of individuals as a result of environmental and economical constraints'*
>
> Gosselain 2008, 67.

Incorporating these variables into archaeology may be a challenge (as discussed below) but it allows a more complete understanding of these societies to be achieved. Ethnographic studies of pottery production have pushed the selection of clay beyond its techno-functional affordances and conclusively established the social mechanisms in action underlying the spatial and temporal variations in clay selection and processing (Gosselain & Livingstone-Smith 2005, 34). It has become clear that the environmental and technological constraints, the economic and subsistence base, social and political organisation, and ideology or belief, all have a profound effect on the objects produced (Sillar & Tite 2000). Despite this, archaeological ceramic studies have continued to focus largely on chronological markers and techno-functional indicators (Gosselain & Livingstone-Smith 2005, 34), of which the study of gabbroic pottery is a prime example.

A number of studies have focused on clay sourcing strategies, and have demonstrated that numerous factors cannot be solely related to geological variability, processing practices and political or cultural regions (Costin 2000, 381). Work with pottery producing communities in south-western Niger in Africa has demonstrated that, for instance, not all clays are socially 'appropriate' (Gosselain & Livingstone-Smith 2005; Gosselain 2008). Local people believed that good clay is a living material that travels underground and reveals itself to the potter through daily activities such as farming (Gosselain & Livingstone-Smith 2005, *passim*). This could be considered an *animic* belief system (see below). Whilst ritual and taboos played an important part in clay procurement, practical factors were also considered as most sources were within 1km of the settlement. They concluded that potters *'negotiate a path across a patchwork of knowledge and experience that are both inherited – and thus widely shared – and constructed through their daily practice'* (Gosselain & Livingstone-Smith 2005, 40, 44).

However, clay selection is not always associated with ritualised behavior. It is also affected by changes in political structure and social hierarchies, as demonstrated in Neupert's (2000, 249) research in the Philippines, which uncovered a link between the socio-political behaviour of potters and patterns in clay composition on ceramics from two factional groups within one community. When the local mayor was up for re-election he would negotiate access to good clay sources to encourage potters to vote for him, and the competition would follows suit (Neupert 2000, 257). This subsequently led to two distinct political factions and thus two fabric groups within the community, highlighting the potential impact of changing political systems on the fabric composition of pottery (Neupert 2000, 260).

This ethnographic testimony challenges petrographic analysis to go beyond geographical provenance and technical properties to realise its potential

in unlocking the social choices and meanings of the clays used. A suggested metaphysical characterisation for pottery would encompass the socially specific meaning of clays as highlighted above, towards an understanding of the nature of being in the world and the complex meanings hidden in the fabric of pottery.

A new way forward

Petrology is not generally considered a highly theoretical field of interpretation, and is more often categorised as entirely processual in nature. The jump from recording minerals in thin-section to commenting on the construction and maintenance of social realities in past societies may seem daunting, but archaeological theory and petrological data can work together towards this common goal. How then can petrographic analysis uncover *meaning* from evidence whose social context is lost in the past?

Archaeological theory can be used to fill this void by drawing on the vast array of concepts, approaches and philosophies disseminated to construct meaning. The key theoretical themes employed here are: *materiality* (concerning the construction of meaning and nature of relationship to objects), the *life-world principle* (which shapes our perception and ability to gain meaning through action within a temporal framework), and the *socialised landscape* or *taskscape* (in which the action and our experience of it occurs). These social concepts can be tied into the analysis of pottery fabrics using a micro and macro social networks model.

Materiality

Our perception of objects in the past is ultimately defined by how we perceive objects today. To us, material culture is the product of culture or human action upon materials. Karl Marx (1970) suggested the moment 'man' appropriates 'nature' for his own needs he alienates those objects from himself so that they can circulate independently as a product within society. However, '*nature*' or matter, in this case clay, is not an inert element and past populations may have related to clay sources in different ways, giving *'nature*' meaning prior to circulation. Archaeology has begun to move away from a Cartesian view of the world of objects to embrace the inherently complex worlds in which artefacts circulated in the past.

The inherent meaning or identification of an object outside the realm of a western Cartesian ontology makes classifying them very difficult (Pedersen 2001; Descola 2009). However, totemism and animism are useful terms which encapsulate the systems through which many cultures view their relationship between the plants, animals and landscape (Lévi Strauss 1964; Descola 1996; 2009). In totemic systems non-human forms, such as landscape features or objects, are treated as signs. In animic systems a living force or personality can reside or flow through

a form and are seen as having relationships and mobility (Descola 1996, 87). The totemic ontology is more objective, as the object or landscape feature can be viewed by anyone and the meaning passed on. The Australian Aboriginal view of the landscape is essentially totemic, as certain places in the landscape are attributed an importance derived from the presence of *the Dreaming* (Ingold 2000, 113). The totemic power or value of these places could be tapped and used, for example, ochre and clay from these sites used as body paint might grant the wearer protection from bad spirits. It has been noted that white clay associated with important places was prized and traded over large distances, despite the presence of other sources of white clay throughout the region (Taçon 2004, 34, 36). This example makes the important point that the processes of action upon matter engender identity and ontology which can only be understood by an informed audience; so to us the white clay would not have the same meaning.

Other ethnographic studies of non-western cultures demonstrate that objects and people do not always inhabit separate realms and that the boundaries are often blurred. This is exemplified in the western idea of fetishistic objects in non-western societies, where a clay figurine could perform in many realms, operating as an agent within society as an idol, a spirit and a clay fabric, accommodating all relations and meanings in one object (Nakamura 1995, 23). Fetishism was defined by 18th century explorers and missionaries because they could not taxonomically assign an object such as a clay idol to mind or matter (Graeber 2005). A new category was created for blurred objects in our world that are generally disapproved of and seen as dangerous in western culture because they challenge our reality in which people and objects are separate (Latour 2004, 241). This study will utilise the term totemic to classify an alternate social understanding of a material such as clay that goes beyond our traditional western viewpoint.

Alberti (2012) illustrates the point that human action upon matter creates meaning to its intended audience. He proposes that meaning and material are extensions of practice such as in the creation of images on pottery, rather than deriving from the finished appearance. His theoretical approach, developed from perspectivism, was used to interpret ceramics from the La Candelaria culture of first millennium AD in north-west Argentina. He argues that images are *'motions, motile extensions of practice, rather than static representations or vehicles for communicative acts'* (Alberti 2012, 13). The applied, pierced and incised elements that produced the final image on the pottery are representations of participation and repeated acts on the material. He suggests that the final image communicates to other cultures one level of meaning, but that to the intended audience it is the practices associated with production and the places of those practices which are specifically embodied and understood. Doing the decoration is where the meaning lies – not

the finished pot. Therefore, objects are the making solid of ideas or ideologies; their materialisation (DeMarrais *et al.* 1996).

So how do we utilise the materiality of artefacts in archaeology? It raises the point that, as Thomas states,*'archaeological evidence becomes no more than a poor reflection of relationships which are now entirely vanished'* (Thomas 1995, 13). Typically archaeological interpretation begins with the physical and mechanical properties of material culture, using techniques such as petrology to begin to decode and interpret objects from the past. However, the field of archaeometry is typically seen as being far removed from a more anthropological understanding of the interwoven nature of the social and material worlds. Jones (2004, 331) suggests that materiality is an ideal interpretive medium to unite the two fields to the great benefit of archaeology. He states:

> *'just as the notion of materiality encompasses the process by which the conceptual and material are woven together; we need to interweave the conceptual and materials-based components of the discipline in our analyses'*
>
> Jones 2004, 331.

This discussion on materiality highlights how materials are intertwined and inseparable from us and our daily action in the world, making it impossible to define an object from the person. This then situates pottery in a complex material life-world where boundaries and meanings are articulated within an arena of reciprocal action that constructs and maintains our reality.

The life-world principle

The concept of the life-world has great relevance to clay sourcing strategies as it explores the reality that is lived experience created through action in our everyday lives. It works on the principle that we experience the life-world through our lived experience of the past, and unconsciously perceive the direct meaning of an object, person or environment with reference to that previous experience (Schutz & Luckmann 1989). Although similar, it differs from Bourdieu's (1994) concept of *Habitus* because it explores the realm of how new experiences are incorporated into the province of everyday human practice and how our actions can change that realm and construct new meaning. Meaning is derived by reflecting on previous encounters within a broader context to find something similar, which is memorable and open to enquiry. The experiential memory of the actor can also be expanded by drawing on a social knowledge-stock as a member of a historical society (Schutz & Luckmann 1989, 42). In this way a frame of reference is constructed to inform social choices in acts and gain meaning from new experiences.

Through a process called *appresentation*, past experience can form knowledge-stocks that enable the actor to create a theory of reality within which the unconscious action of everyday life is constructed and used. However, we cannot experience everything ourselves and this forms barriers in the life-world that we have to break to reaffirm our reality. These barriers are not physical but conceptual, such as knowing distant places exist without experiencing them. They can only be transcended using appresentation which is constructed using *signs* (*e.g.* oral traditions), *symbols* (*e.g.* participation in ritualised acts), *indicators* (*e.g.* tangible objects or places), or *marks* (*e.g.* imagining a future journey or act) (Schutz & Luckmann 1989, 131). For example, in our modern socialised landscape a red letterbox is a 'place' to which we journey for a specific purpose and engage with by inserting a letter, thus reaffirming our position in the life-world. The letterbox is an *indicator* with which to acknowledge the presence of distant places we might not have experienced ourselves but know to exist. The letter is a *mark* conveying our individual belief that there is a world beyond our experience, and that it is possible to transcend time and space in the delivery of it.

This way of looking at reality aids our understanding of how others may have constructed theirs and how to reconstruct them through artefacts. The identity of Australian Aboriginal peoples is based on a reality entirely different from our western perspective. It is based in a socialised landscape established in *the Dreaming* when ancestral beings created the topographic features through their actions (Smith 1999, 193). Moving through this socialised landscape enables them to transcend time and space, because their life-world signs, symbols, markers and indicators form a specific social knowledge-stock creating alternate life-world boundaries. Places in the landscape form fixed points in social space where people can interact with the ancestral past by visiting them.

Smith observes that: *'social identity is constructed and reconstructed in relationship to place and ancestral associations, as people live in and move through their landscapes'* (*ibid*: 193). Whilst at these places time does not exist, they are at once in the past with their ancestors and in the present (Burridge 1973). Their relationships to place, and thus identity, require them to visit these places regularly, and children are not considered part of the social group until they have done so and have been told how their ancestors in the Dreaming created them (Smith 1999, 199). The only materialisation of their identity is through the physical performance of creating rock art which visually embodies intangible stories, principles and truths, reinforcing their identity in that place (Burridge 1973, 80). It is entirely possible that the act of extracting certain clays in the past, such as gabbroic clay, had similar social associations and meanings, as Helen Marton discusses in this publication.

Places as nodes in a socialised landscape

The importance of place in a socialised landscape is of great relevance to a study of social contexts of clay sourcing. The materiality of an object is as interwoven with us as we are within the environment we inhabit, forming a cyclical relationship between all conscious and unconscious elements of our world. Therefore, places in the social landscape represent nodes of transcendental meaning to be accessed by informed agents and engaged with through bodily action. A clay source would be a significant node in any landscape.

There are echoes of this in the modern landscape of Cornwall, as one of the main roads crossing the Lizard Peninsula goes directly to the source area of gabbroic clay. It crosses the flat expansive moorland of Goonhilly Downs, which contains few natural landmarks. The only prominent features are Bronze Age burial mounds, the largest standing stone in Cornwall and early Christian stone crosses, which may have been waymarkers along ancient route ways. These monuments formed upstanding visual nodes in the social landscape in the past and the present. The peat on the Goonhilly Downs was cut for fuel in the 18th century (Dudley 2011, 114) and it is possible that this was how gabbroic clay 'revealed itself' to past peoples. The monuments and everyday practices in the area of the gabbroic clay source represent bodily action and the formation of nodes in the socialised landscape.

Ingold (2000) views action in the world around us as forming a *taskscape* rather than a landscape. He proposes a social space that is quantitative and heterogeneous in which an array of activities may be performed, and that places are not locations but histories and nodes in the matrix of movement (Ingold 2000, 195). This is a reaction to the assumption that the landscape, like physical materials, passively waits for significance to be inscribed upon it, which returns us to the mind versus matter ontology once again. Gosselain has emphasised the importance of the 'space of experience' in the landscape in observing potters in Niger. He found that identity and a sense of belonging were built upon daily chores, seasonal migration, family networks, exchange and travel; within this framework clay extraction sites became embedded locations of social knowledge, transforming the significance in the landscape (Gosselain 2008, 77).

Mills and Rajala (2011a; 2011b) have drawn on Ingold's *taskscapes* in their interpretation of Roman ceramics mapped as part of the Nepi survey in Italy. They developed the term *ceramiscene* to encapsulate a landscape that is created, manipulated and experienced by the manufacturing, usage and disposal of fired clay. The function and fabric of ceramics were related to the geographical location of clay sources and Roman features in the landscape. They found that fabrics

provided information of the different sources used suggesting the distribution of each producer and that the function indicated status. These results revealed the economic landscape and how the region developed into a villa economy, benefiting from the wider trading networks of the empire.

Michelaki (2012) has also looked at clay sources in a comprehensive study of ceramics from Calabria, Italy, utilising chemical and mineralogical analysis on samples as well as experimental firing to establish technical properties. She presents a methodology that could link the *'choices prehistoric potters made, as reflected in their ceramics, with the choices their landscape could afford them, as reflected in the extent and distribution of local clays'* (Michelaki 2012, 235). Michaelaki states that in order to gain insights into how daily life was organised we need to establish if clays were used because they were simply available or whether they were chosen for other reasons. She asks:

> *'[w]hat does the targeted use of sediments suggest for the ways they perceived their landscape and for the meaning/value of the pots they made out of those sediments? How stable was the choice of clays through time?'*
>
> Michelaki 2012, 236.

Her analysis revealed that three main clays are available in the region, which have different visual and technical affordances (Michelaki 2012, 245). Her methodology demonstrated that these analytical techniques can be used to move beyond simple trade, exchange and production organisation, towards understanding past perception of the landscape, and that social change over time can be observed through ceramic analysis.

The examples above demonstrate that clay sourcing forms complex *taskscapes* and that this process is ideally suited to study through scientific analysis. However, they do not attribute meaning to clay *before* the performative act of extraction, which perhaps misses a vital avenue of understanding, which this paper attempts to incorporate. The principles of '*perspectivism*' could be useful towards this aim, which acts on the assumption that all peoples and animals have the same way of interacting with the world, yet individually *see* different worlds (Alberti 2012). For example, both Marton (this volume) and I, see the Goonhilly Downs as a clay source and a link to ancient potters, and not the bleak moorland most tourists see when they pass through on the way down to the beach. Marton discusses her own personal experiential engagement with extracting gabbroic clay (this volume). She highlights the nature of the maker's journey and emergence of narrative through practical engagement and observations of material, location and environment. As a ceramic artist, she values the journey and the narrative as much as the clay's visual and technical properties. The gabbroic clay source is

part of her socialised landscape and has become a node in her life-world reality which she passes on to each class of ceramic students she teaches on their yearly pilgrimage to collect the clay.

All of the examples detailed above suggest it is the purposeful action of digging clay upon and within the landscape that gives a place meaning. However, what these authors have not considered is the possibility that the clay itself may already have meaning before it is extracted. This begs the question, what originally gave the gabbroic clay its totemic significance and led to its preferential use for 5000 years? Was it the clay or was it the place?

Putting theory into practice

Some of the theoretical approaches discussed above have, as we have seen, been applied by archaeologists. This paper adopts a more holistic approach and merges materiality with the socialised landscape. Such an approach helps us address the construction of identity in regions with small communities through the distribution of material culture related to specific material places in the social landscape. A further example is the Malverns, a highly visible and distinctive range of hills in Worcestershire, where clay and quern stones were sourced throughout the Bronze and Iron Age periods (Moore 2007). Moore suggests that such objects acted as physical references to larger communities, their everyday use reminding people of their regional identity and kinship relations, thereby reinforcing their place in society (Moore 2007, 79, 95). He also points out that material source locations for clay, metals, and salt are often in marginal or liminal parts of the landscape and that extraction was symbolic. The Goonhilly Downs, located on a remote peninsula on the edge of the ocean, is a potentially liminal place, which may have added to the symbolic value of the gabbroic clay.

Andy Jones has applied these concepts to his petrographic analyses of pottery from the late Neolithic settlement at Barnhouse, Orkney. His work explicitly demonstrates how theoretical concepts – or lack thereof – play a central role in determining what and how archaeological material is analysed and how this relates to wider theoretical concerns (Jones 2002, 103). He challenges petrographic analysts to go beyond the use of clay as a material substance and to look at the possibility of linking its observed properties to Neolithic social relations, or to how it enables social possibilities and imposes constraints (Jones 2004, 336).

> *'…by focusing on clay as a substance, we can begin to conjoin hitherto distinct questions relating to cooking, storage, feasting, fragmentation, figurine production, procurement, performance characteristics and the use of clay as a building resource'*
>
> Jones 2004, 336.

At Barnhouse, he found the combination of tempering material and wall thickness related to vessel size and decoration. Shell-tempered vessels were produced on site and used by houses central to the settlement, while the rock-tempered fabrics were used in the peripheral houses. Each contained a unique mix of raw materials gathered from specific places in the landscape within 1km. Jones (2002) suggests there was a link between the rock source locations and Neolithic monuments to the dead and other past communities, indicating access and ownership were related to identity. He states *'the act of combination itself was constitutive of the expression of social identity and provided a metaphor for the creation of links between different households and communities'* (Jones 2002, 130). However, the expression of this identity was concealed: the pottery was all decorated in a uniform style used throughout the settlement, and is typical of Groove Ware in this period. This is a statement that resonates in the story of gabbroic clay sourcing and choices in pottery production presented below.

Case study: Gabbroic clay on the Lizard Peninsula

The aim of this paper is to demonstrate the potential of petrographic analysis undertaken within a strong theoretical framework. This is based on the author's doctoral research, which examined whether changes in society could be observed through the changing pottery fabrics of the post-Roman to early medieval periods in Cornwall, defined here as the 4th-11th centuries AD. A combination of ethnographic analogy, archaeological theory, and petrological analysis was used to provide an overview of socially motivated clay sourcing strategies, in stark contrast to the deterministic views of technological motivations behind clay selection explored in past research.

This study used clay procurement strategies as a means of mediating macro-scale processes to establish that changes in clay sourcing are the expressions and not the result of social change. It is argued that specific clays moved through a socialised landscape and were used to actively create and express the reality and identity of the peoples living within the settlements of Trebarveth, Carngoon Bank and Winnianton. Petrographic analysis was undertaken on assemblages from these three sites, all located on the Lizard Peninsula (Fig. 2.1). The sites were selected for their spatial relationship to the gabbroic clay source, their differing local geologies (making the clays locally available and particularly diagnostic), and the size and date of the assemblages.

Petrographic analysis of over 100 sherds representing 14 fabric groups was carried out to confirm the macroscopic identifications and determine the proportion of fabrics derived from locally sourced clays and gabbroic clays at each site and within each fabric group. The results demonstrated that the proportion of

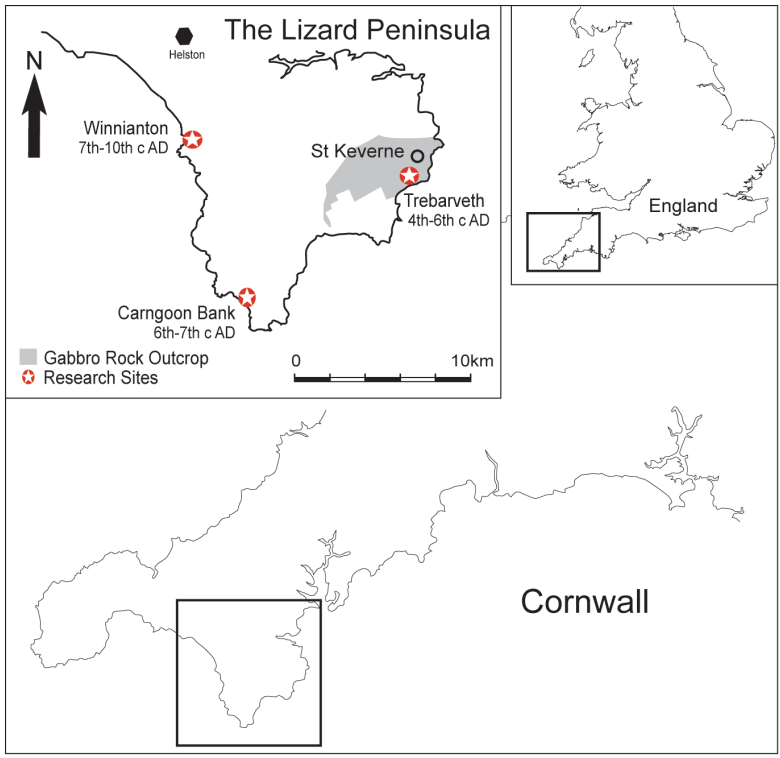

Fig. 2.1: Location map showing the three research sites with occupation periods and St. Keverne.

gabbroic clay used in pottery fabrics fell over time, and that the use of local clays increased markedly around the 8th century AD. This supports previous petrographic analyses, but established the longest sequence of fabric variation in one region and for the first time examined the extent to which clays sourced local to settlements were used over that period.

The data demonstrated that ceramic fabrics were specific to each of the three research sites, indicating the practice of mixing local (near settlement) and gabbroic (regionally distributed) clays was commonplace. The distinction of local versus regional or non-local is vital: it does not reflect the physical distances involved, rather it is a metaphor for individual and group identity. As explored in the discussion above, the life-worlds of many cultures are not constrained by physical, temporal or logistical boundaries and it is possible that gabbroic clays were mixed with local clays to physically indicate an adherence to a shared social reality, regional identity or set of traditions.

The dynamic interplay of regional and individual identity, as seen in the petrographic data, may be addressed through the sociological concepts of macro- and micro-level networks. In most organised societies, hierarchies and social identities are maintained at a regional macro-level, comprised of macro-level networks of regional interaction which maintain a shared reality with micro-level networks, which represent the everyday life as experienced by the individual. However, during periods of social disruption or change, regional linkages break down and micro-level networks become much more important. This model makes it possible to comment on social change as seen in the data when looked at in the context of each period and fabric group.

The social structure throughout later prehistory and the Romano-British period in Cornwall is generally considered to be wholly rural and composed of extended family groups living in small settlements scattered throughout the landscape. There is little trace of the kind of central places seen elsewhere in the Iron Age, and particularly Roman, Britain – there are no roads, no villas, no towns and very few military installations. The region is considered as peripheral to more acculturated Romano-British social structures, and is generally ascribed a strong regional identity. In the post-Roman period under consideration, the social structure of Cornwall appears to have been one of egalitarian dispersed rural settlements with a shared regional identity expressed through its material culture. Using the mechanics of macro and micro networks, a model for the link between social structure(s) and pottery fabrics can be identified (Fig. 2.2).

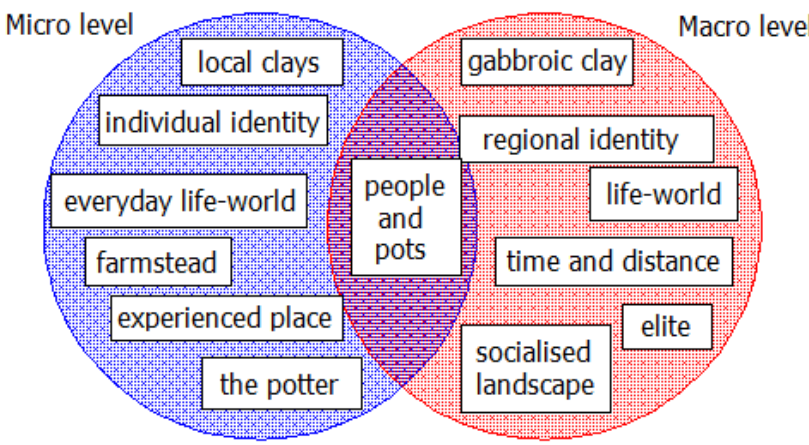

Fig. 2.2: A balanced micro and macro network.

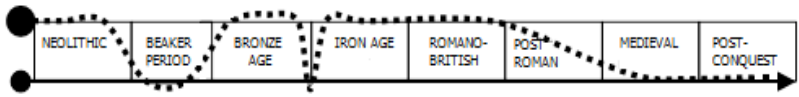

Fig. 2.3: Proportions of gabbroic clay in Cornish ceramics over time.

People and pots were situated in the transient conceptual world that is subjected to the forces of the micro and macro worlds. The reality of the individuals within these worlds is constantly renegotiated and it is suggested here that this is expressed in a tangible form through the fabric of the pottery they produced.

The use of gabbroic clay in ceramics can be seen to fluctuate over time (Fig. 2.3), often between periods of apparent major cultural change (Wood 2011, 281). It would be logical to assume the technical properties of the clay were the reason for its continued use, as Peacock (1969b, 1988) and Harrad (2003, 2004) suggest, and that these fluctuating levels may be the result of restricted access to the source during times of social change. However, this does not take into consideration the fact that technically adequate clays exist throughout Cornwall and that, as discussed above, the selection of clays always involves some level of social significance or motivation. The results of the petrographic analysis clearly show that there was a shift in clay sourcing strategies from gabbroic to locally sourced clays in the 8th century AD, after which gabbroic clays never regained popularity. By interpreting the petrographic data through the theoretical approach put forward above we can throw some light onto the meaning behind this fabric change. We need to look below the surface of the pottery, beyond the suites of minerals and into the alternative embedded social reality hidden within the fabric.

Results of petro analysis

The results demonstrate differences in the fabric composition of vessels produced on the three sites over the period of time studied. The pottery at the Romano-British settlement at Trebarveth (occupied 4th- 6th AD) contained a very high proportion of pure gabbroic clay and is typical of settlements of that date throughout Cornwall. Trebarveth is located on the gabbro, and the assemblage contained its own sub-macro loessic gabbroic clays; however, while this is of equal technical quality, the overwhelming dominance of the macro-level gabbroic clay suggests a dominant macro-level network (Fig. 2.4). This would seem to represent a stable social and economic system based on kinship networks that were maintained through the use of gabbroic clay.

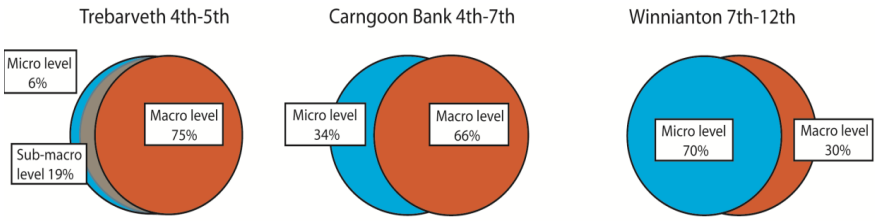

Fig. 2.4: Proportions of local clays (in blue) to gabbroic clays (in red) in the assemblages from Trebarveth, Carngoon Bank and Winnianton, highlighting the shift from the regional macro gabbroic networks to local micro networks.

The ceramic assemblage from Carngoon Bank (occupied 5th- 8th AD) was still dominated by gabbroic clays, although local hornblende-schist/ serpentine clays were beginning to be used, suggesting a strong macro-level network, though perhaps now in decline (Fig. 2.4). This level of continuity is surprising considering the dramatic shift in regional settlement patterns experienced in Cornwall during this period (Herring *et al.* 2011). On the other hand, this apparent social upheaval is reflected by the development of new forms *(ibid.*). The grass-marked wares – so far unique to Cornwall – replaced a varied range of late and post-Roman vessel forms with a restricted range of cauldrons and platters, which would appear to reflect changing eating habits or lifestyle. Yet this change is not expressed in the pottery fabrics (Thorpe and Wood 2011, 276).

Fabric analyses at Winnianton (occupied 7th-11th AD) show a dramatic shift from the gabbroic fabrics used in early phases of occupation to local micaceous rhyolitic-derived clays by the 9thcentury AD, strongly indicating a change in the macro- and micro-level networks (Fig. 2.4). This could indicate that the earlier regional networks had collapsed, or that a deliberate choice had been made not to express kinship relationships through the medium of the totemic gabbroic clay (Wood 2013).

The selection of a single clay source and its use over millennia certainly fulfills the definition of a ritual act or tradition, and if we identify this act as the physical manifestation of a shared reality through the production of pottery, gabbroic clay was, very clearly, a totemic material. Gabbroic clay may have embodied a belief system or tradition based on kinship, real or attributed, perhaps representing a regional tradition that, over time, fostered and maintained social identity. It is this realisation that allows us to make new observations about fabric variations in relation to the composition of society.

Materiality in the gabbroic life-world reality

The examples cited above indicate that pottery fabrics had the ability to express a message to informed agents, as pottery production was not centralised and changes in the fabric of vessels seen on other settlements would have stood out. The abundance of white flecks (gabbro) in the fabric during macro-level dominant periods perhaps displayed aspirations to social homogeneity, expressing a cohesive reality and connection to a regional kinship network. The hornblende schists at Carngoon Bank would present itself as a black sparkly element to the fabric and micaceous rhyolitic inclusions in ceramics from Winnianton would add a white shiny quality to their exterior. These gradual differences would presumably be lost on a visitor who would see vessels of the same form and function for that period.

Whilst the form and function of pottery changed from the 4th -11th centuries, the practice of selecting clays in particular proportions and mixing them to form visually distinctive fabrics continued throughout. This demonstrates a conscious choice in production by the individual potter that was not solely driven by technical choice. Instead, it was an expression of identity within a specific social reality at that point in time.

Alberti (2012) has made the point that action/motions upon pottery, and not the final article, express meaning. Thus it is possible that the act of selecting and mixing clays could also be the motivation for the final product. The mixing of gabbroic clay (regional social reality) and local clays (individual identity) could have been a socially significant act and performance. If so, the ceramic petrologist, through the lens of a petrographic microscope, is the first person to see this performative action that had meaning to the individual who made it. The exterior of the pottery tells one story, but the story unravelled through the thin-section offers a new way of interpreting the suites of minerals recorded. In acknowledging the materiality of gabbroic clay, we can build on Peacock's initial characterisation and offer a new dimension to the petrographic data collected over the past 50 years in Cornwall.

Why the 8th century?

The declining utilisation of gabbroic clay in the 8th century AD gives us an insight into the nature of the socially motivated practice of clay sourcing and its role in society. The 8th century in Cornwall is characterised by the adoption of early Brittonic (Celtic) Christianity (Preston-Jones 2011), a religious movement that has a strong connection with the gabbroic clay source area.

The concept of a *taskscape* associated with gabbroic clay extraction has already been outlined, and situates the source as a node in a complex socialised landscape.

There may be parallels with the Aboriginal traditions discussed above, in which pilgrimage to the source reinforced your place and beliefs within your social group. The clay then becomes a *marker* in the construction of past life-world realities, representing a place that may not have been physically seen, and one perhaps beyond the reach of nearly everyone, but one that could be acquired and displayed in the fabric of pottery seen and used every day. The remote and liminal nature of the Goonhilly Downs also adds significance to the source, as the examples above have demonstrated. To Marton (this volume) the 'maker's journey' is part of the gabbroic narrative linking her to the past, and this may also have had a significance to past peoples. Contemplating the logistical feat of extracting and distributing the substantial quantities of this clay throughout Cornwall for around 5000 years is beyond the scope of this paper, but we may assume that individual pilgrimages or organised groups travelled across the Goonhilly Downs to its source, which Harrad (2004) has suggested is near the village of St. Keverne (near Trebarveth Fig. 2.1).

Is it then simply coincidence that St. Keverne was chosen for the site of one of the earliest Christian collegiate houses in Cornwall (see Orme 2010)? It could be suggested that, in a region with few central places prior to the imposition of Norman towns, the gabbroic node in the socialised landscape was identified as an ideal platform with a captive audience from which to proselytise. Over time this node may have come to represent a node in a new Christian *taskscape* in which stone crosses were erected to mark the boundaries of estates and people came to hear and be taught the word of God.

Early Christian ecclesiastics may have intentionally targeted the macro-level network, within which the gabbroic clays operated, to disseminate their new ideology. The totemic status of gabbroic clay may have made it a valuable pawn in the manipulation of native social realities and beliefs. The appropriation of old idols for a new religion is a well-established tactic of enculturation identified by anthropologists and historians. For example, the Venerable Bede relates the advice of Pope Gregory the Great to missionaries that pagan idols should be destroyed but that Christian alters should be erected in their place (Dunn 2010, 56). Archaeological evidence supports this, finding churches built on top of Roman mausoleums, such as at Lullingstone in Kent (Blair 2005, 71; Carver 2009).

Glassie (1994) has commented that the vacuum created by deconstructing native objects of social power enabled new forms of power to flourish and be adopted. Gabbroic clay may have been such a material and its relationship with Celtic missionaries may have had far reaching repercussions. If gabbroic clay was

appropriated as a tool for conversion then this confirms its totemic status within society and that its physical location had importance in a socialised landscape.

The petrographic data from Winnianton (*c.* 7th-11th) goes some way to support this. The shift to locally sourced clays coincides with the possible establishment of a Christian hermitage near the settlement and later the appearance of incised crosses on vessels. Perhaps the statement conveyed in changing the fabric of pottery in the 8th century needed to be reinforced with more visually explicit symbolism by the 10th century. It could also be suggested that by this time the mode of expressing identity and shared social reality through the performative act of selecting and mixing clays was no longer recognised. The change in fabric demonstrated to others in the regional life-world that they accepted the changes and had moved on from the old ways.

Christianity may have eroded the importance of the macro-level regional networks by undermining the totemic social importance of gabbroic clay, without which the shared reality could not be maintained and the regional kinship networks would have collapsed. It is conceivable that gabbroic clay became a taboo material and was vilified by the church, leading people to utilise local clays, representing individual identities not bound to the gabbroic social networks of the past. In a very literal sense, the fabric of life in Cornwall changed forever.

Conclusion

A traditional interpretation of the petrographic data arising from this analysis would establish provenance and suggest that there had been a change in procurement. This analysis demonstrates that the marriage of archeometry and materiality advocated by Jones is both possible and desirable. This paper builds on Peacock's initial characterisation of gabbroic clay in ceramics but goes beyond the techno-functional towards a more metaphysical characterisation. The results suggest that changes in social identity are hidden and that only by asking specific and theoretically informed questions before and during petrological analyses can we reveal this level of information which relates not just to a cultural statement, but to the individual who made the pot and the social choices they made before production in the sourcing of specific clays. The changes identified relate to wider regional changes in the structure of society in Cornwall and its changing identity. When combined, it gives us a unique viewpoint from the micro-level of the individual to the macro-level of the region as a whole.

The set of theoretical perspectives discussed in this paper offers interpretive tools that enable archaeology to infer a level of meaning normally associated with clay sourcing practices studied through ethnography. The application of a

theoretically informed eye behind the microscope and an awareness that clay is not a socially neutral medium, has demonstrated that behind the cultural façade of pottery individual identities and expressions of social realities can be laid bare.

The totemic status of gabbroic clay in Cornwall appears to be archaeologically unique, and does not appear typical of other clay sourcing practices identified elsewhere in Britain to date. However, this may simply reflect the diagnostic qualities of the gabbroic clay, and it does demonstrate that complex social practices surrounded clay sourcing strategies. The individual act of selecting and mixing clays is a social statement and window into past life-worlds, not necessarily just a road map for trade distribution or technical specification. The gabbroic case study has shown that geological provenance is just the starting point and that with a more metaphysical approach to interpreting petrographic data the social life of clay has much to tell us.

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