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MORE THAN THE MOTIFS: THE ARCHAEOLOGICAL ANALYSIS OF ROCK ART IN ARID REGIONS OF THE SOUTHERN HEMISPHERE[1]

MÁS QUE MOTIVOS: EL ANÁLISIS ARQUEOLÓGICO DEL ARTE RUPESTRE EN REGIONES ÁRIDAS DEL HEMISFERIO SUR

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Three regional rock art studies undertaken in the southern hemisphere (northwest central Queensland in Australia, Lluta Valley in northern Chile and Quebrada de Humahuaca in Northwest Argentina) are analysed. Based on the relationships between rock art and other aspects of the physical, social and chronological context of its production, we show the articulation between the production of rock art and past social strategies. The three examples demonstrate many consistencies in the way rock art has been utilised in arid environments while also identifying regionally distinct variations in technique and function. In each of the arid regions, competition arose for limited and valued resources. In each example, the production of rock art was used as a powerful tool to negotiate newly arising circumstances in order to ensure predictable and desirable economic and social outcomes for the artists' group. The methods and form used to achieve these outcomes varied in each case study, because of the availability of materials for art production, the topography and environmental conditions in each specific area, particular cultural preferences and the ways in which people utilised art. In northwest central Queensland the rock art assemblage was employed for the negotiation of group identity at several levels. In the Lluta Valley, the geoglyphs embody social, political and economical aspirations, being produced as a means of legitimating the access of lama caravans to the coast and its resources. In the Quebrada de Humahuaca increased competition for resources led to the production of different rock art assemblages; the herders produced panels that played roles such as marking grazing territories, commemorating past events and most significantly, as part of the ritual life of the herders.

Key words: Rock art production, context, social strategies, arid environments.

Se presentan tres estudios regionales en ambientes áridos del hemisferio sur: centro noroeste de Queensland en Australia, valle de Lluta en el norte de Chile y Quebrada de Humahuaca en el Noroeste Argentino. A partir del análisis de los vínculos contextuales entre el arte rupestre y aspectos físicos, sociales y cronológicos de su producción, se explican los modos en que la producción del arte se articula con diferentes estrategias sociales. Aunque los casos de estudio revelan consistencias en el empleo del arte rupestre en ambientes áridos, asimismo exhiben variaciones regionales en técnica y función. En cada una de las regiones desérticas estudiadas, las condiciones ambientales restrictivas y la competencia por recursos fue un factor influyente en la producción del arte. Los artífices usaron el arte rupestre como una poderosa herramienta para conseguir y asegurar resultados sociales y económicos concretos, cuya variabilidad en las diferentes regiones obedeció a la disponibilidad de materias primas, condiciones topográficas y ambientales, preferencias culturales específicas a cada grupo, así como a los usos específicos del arte rupestre. En el centro noroeste de Queensland, el arte rupestre fue empleado, en diferentes niveles, en estrategias de negociación de identidad y pertenencia al grupo. Mientras que en el valle de Lluta, los geoglifos materializaron aspiraciones sociales, políticas y económicas de grupos de tierras altas orientadas a legitimar el acceso, mediante el tráfico de caravanas, a los recursos costeros. En la Quebrada de Humahuaca, la creciente competencia por recursos condujo a la producción de diferentes conjuntos de arte rupestre por parte de pastores, cuyo rol radicó en la marcación de territorios de pastoreo, eventos conmemorativos y, principalmente, como parte de la vida ritual de los pastores.

Palabras claves*: arte rupestre, contexto, estrategias sociales, ambientes áridos.*

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In this paper, we demonstrate the value of an archaeological approach to rock art studies that enables researchers to identify aspects of past human behaviour not always discernable through the analysis of other material remains alone. Rather than studying rock art in isolation, the theoretical approach we adopt also analyses the relationships between rock art and other aspects of the physical, social and chronological context of its production in order to develop a clearer understanding of the articulation between the production of rock art and past social strategies. Three regional rock art studies undertaken in the southern hemisphere demonstrate many consistencies in the way rock art has been utilised in arid environments while also identifying regionally distinct variations in technique and function.

Rock Art Studies in Australia, Chile and Argentina

The history of rock art studies in each country shares similarities. Studies have generally moving from earlier descriptive and non-contextual research to more recent contextual approaches that are now routinely included as an integral component of regional archaeological studies. These changes within the discipline have, in part, resulted from improvements in direct and/or indirect rock art dating techniques developed over recent years, which have enabled researchers to confidently incorporate rock art data into comparative analyses across entire archaeological assemblages. In addition, new theoretical perspectives have provided the means to address questions relevant to other archaeological sub-disciplines rather than focusing on the meaning of the motifs themselves. Such advances place rock art studies into mainstream archaeological research.

As new theoretical approaches to the study of rock art have been developed worldwide, the type of questions being examined have been redirected from those looking to classify art as a chronological and/or geographic marker, to questions that focus on the ways in which art can encode social, economic and political information or interaction. Most recently the emphasis has been placed on questions which seek to understand how art is used in the negotiation of social strategies (Conkey 1990:6-15). This paper will focus on the last of these approaches. Acknowledging the variability in rock art within the three countries depending on time, space and cultural differences, we shall concentrate here on selected assemblages that can be analysed most profitably using the following theoretical perspective.

Theoretical Perspective

The ultimate aim of this paper is to explore the ways in which art and its contexts of production in southern deserts have been used to achieve particular social outcomes. For the purposes of this paper, art is defined in broad operational terms as "deliberate communication through visual form" (Layton 1992:1). Art has three parts: intentionality from the maker's perspective, the visual form itself, and the message that is communicated to the viewer.

The mark or motif is part of a symbol system where the motif is a referent for something else. What is communicated by the symbol depends upon the cultural milieu of the viewer. If the viewer shares the same visual system with the producer, what is expressed in, and what is communicated by the motif, may be very similar (Morphy 1991:145; Smith 1996:10-34). But from an archaeological perspective where prehistoric art systems are being studied, such coalescence is not possible (Davidson 1997). While this warns against the search for original meaning in art, as archaeologists this tripartite concept of art emphasising the "interaction between the human agents and the material" (in this case the art) (Davidson 1995:892; see also Conkey 1989; Noble and Davidson 1996), demonstrates that the motif or composition is the communicative link between artist and viewer. Analysis of the form thus provides a means of accessing aspects of how the art system operated. Such an approach to prehistoric art "lifts the heavy semantic load" (Wobst 1992), because it is the interrelationships between art and the contexts of its production that informs, rather than the content of the art itself (see also Fiore 1996).

The conceptualising of art in this way sees art as a practice rather than an object (Eagleton 1983:114), and by perceiving the motifs as evidence of a practice, it remains connected to the participants as "there are no practices without human subjects" (Conkey 1989:120). Therefore, patterns observed in archaeological data can be used to formulate hypotheses about the *actions* of the artists and the reasons such patterns were produced in particular

contexts (Conkey 1989:120). The genesis for the study of art in this way began with the basic premise that the nature of things

> may be said to lie not in the things themselves, but in the relationships which we construct, and then perceive between them. The concept that the world is made up of relationships rather than things constitutes the first principle of that way of thinking which can be properly called 'structuralist' (Hawkes 1977:17-18; see Conkey 2001 for an overview).

Current perspectives on structuralism have turned away from the concept of the structure representing a retrievable world view or group ideology per se and sought instead to understand, not only the structure behind the object, but increasingly the "referential context of social action" (Hodder 1982:8; see also Conkey 2001). It is here that the move away from structuralism becomes clearer, as the motifs themselves and their relationships are not read as a text, but rather, they are seen as a retrievable link between the intentions of the artist and the reaction of the viewer. The emphasis is then placed on *the study of interrelationships* between all aspects of the art assemblage attributable to the choices the artist makes when producing art. The methodological framework developed in this type of research, analyses the relationships between aspects such as spatial and temporal distribution of the art, the art assemblage itself and the site context and ecology. Analysis of artists' choices about what to mark, who will mark, where to mark, how to mark, when to mark and what might be achieved by marking under particular circumstances, provides a means of accessing *why* artists marked and what those choices might have done *for* or *to* a group (Conkey 1989:129; see also Davis 1990; Ross 1997). It is the interrelationships between the artist's choices, or the organizing principles, which provide the patterns, which characterise the art system (e.g. Lechtman 1977).

The specific choices made by artists when producing art are those that are sought from the archaeological record by the researcher. Therefore, we argue that many aspects of the assemblage such as site location, site visibility and site context are areas where variability would be the subject of human choice and integral to the style of the rock art. For archaeological purposes, the study of areas of choice provides the link between the art assemblage and its producer. From this perspective, style is viewed not only as a means of encoding and communicating information but, in addition, as a means by which people can negotiate social strategies (cf. Gamble 1991:3). The use of style is seen as purposeful, which, whether consciously chosen or not, entails the choice of particular distinctive options of forms, locations etc. from the range of alternatives available (see Sackett 1990:35-36). Style thus provides a tool for the development, maintenance and mediation of social strategies (Conkey 1978). "Style can be used to reproduce, disrupt, alter or create social relationships" (Wiessner 1984:194). The response of the viewers to the stylistic form can be gauged by the producer and changed or varied as the perceived need arises. Thus the production of rock art in a particular way provides a means to mediate social interaction.

Studies using the analysis of interrelationships have proved the potential of this method (e.g. Bradley 1997; Conkey 1980; Gallardo et al. 1996; Morwood 1979; Washburn 1977). However, Davis (1990:27) flagged the limitations of the analysis of the patterns produced from the study of interrelationships (the particular ways of doing things or style) on their own. While it is understood that the selection of certain organising principles were

> made by some individual or group acting in a certain way for a certain purpose, and with certain habits, knowledge, and values ... this possibility cannot be confirmed *from within the stylistic description itself* (Davis 1990:27 [emphasis in the original]).

Therefore, there is a need to develop an understanding of stylistic behaviour and to compare this understanding to other ecological, linguistic, archaeological and ethnological evidence in order to formulate hypotheses about past human behaviour. Martin Wobst (1977, 1992) and Polly Wiessner (1983, 1984, 1988, 1990) have both addressed the issue of stylistic behaviour and its articulation with social strategies and developed hypotheses highly relevant to rock art studies and pertinent to the studies described below.

There are a range of particular qualities inherent in rock art, which make it effective in the development, manipulation and maintenance of

social strategies; first, its high visibility in general but specifically in arid areas and second, its graphic nature. Even if these qualities are not exclusive to rock art, these two properties together provide valuable data from which to analyse regional change. In addition, Wobst (1992) describes rock art as "an open system in which production, use and consumption were in reference to significantly larger visual scapes than are encapsulated in rock faces". Such a view supports the contention outlined in this paper that the clearest understanding of the art itself will be gained by an analysis of as many related aspects of the assemblage as possible. Further, it is the very fact that the art remains exactly where the producer placed it that provides the opportunity for contextual studies such as this. In addition, as rock art is tied to a particular locale, it places cultural actions into a specific context (see also Rosenfeld 1992:237). The location of the art within the landscape provides a means for people to manipulate what would otherwise be seen as something controlled by nature. The marking of the rock surface or the creating of geoglyphs can be seen as a way of modifying nature with culture and linking the two in a way that is common in Australian totemic rock art (Layton 1985; Love 1930) or conversely, naturalising culture (see Castro and Gallardo 1995-1996; Morphy 1991) by making it part of the landscape (Wobst 1992).

Finally, the apparent immutability of rock art adds strength to the message that, unlike some other forms of stylistic messaging, continues to communicate even in the absence of the artist (Wobst 1992). In arid areas where populations are sparsely spread, rock art provides a means of broadcasting a contextualised message while the producer or the people associated with the art assemblage move elsewhere. Rock art, therefore, provides an ideal data base for the analysis of past social behaviour.

Examples of Rock Art Studies Using this Theoretical Framework

Three rock art studies will serve as examples to demonstrate the potential of this approach. Although each of the case studies was undertaken in arid areas of the southern hemisphere, the physical environment of each region differs to some degree.

Northwest central Queensland in Australia (20-23°S 138-142°W, Figure 1) is characterised by low and highly unpredictable rainfall, and extremely high summer temperatures resulting in the limited availability of reliable water sources across the landscape. Although the open grass covered plains and low mountain ranges that dominate the topography are dissected by drainage channels, all are ephemeral and run for a short time only after irregular rain events. The only available surface water is retained in occasional rocky holes along the riverbeds and drainage channels. In contrast, the Lluta Valley in northernmost Chile located in the South Central Andes (19ºS 70ºW, Figure 2) receives no measurable precipitation at all, but more or less reliable water and other economic resources can be obtained in a narrow strip along the valley floor where discharge from the Andes drains to the Pacific ocean in the west. Rich marine resources, however, are available along the coastline in this semitropical hyper-arid zone (Santoro et al. 2005). The Quebrada de Humahuaca in Argentina (23°S 65°W) is a long rift valley system located in the South Central Andes running from the high Puna southwards to the Yungas (Figure 2). The environment is arid with climate and resources varying according to altitude. Springs provide limited reliable water sources in the higher reaches of the valley where grass affords a suitable habitat for a variety of animals although extremes in temperatures limit the species able to flourish. However, the limited availability of resources, especially water, would have been a constraining factor for past populations in each of these regions but differences in topography and spatial distribution of resources are likely to have led to very different patterns of land use in the past.

Example 1: Northwest central Australia

The dominant motif in the rock art of northwest central Queensland over an area covering approximately 32,000 km^2 (see Figure 1) is a distinctive, highly standardised painted anthropomorphic motif (Figure 3). A study of this motif provides an example of the theoretical framework outlined above. Spatial analyses of art assemblages across northwest central Queensland (see Ross 1997) showed that the distinctive anthropomorphic motifs are not produced outside the region. Multiple strands of indirect evidence, as well as an AMS radiocarbon date obtained from the charcoal pigment used to paint one of the anthropomorphic motifs (874±64 BP, Ridges 1995) indicated that the motifs were

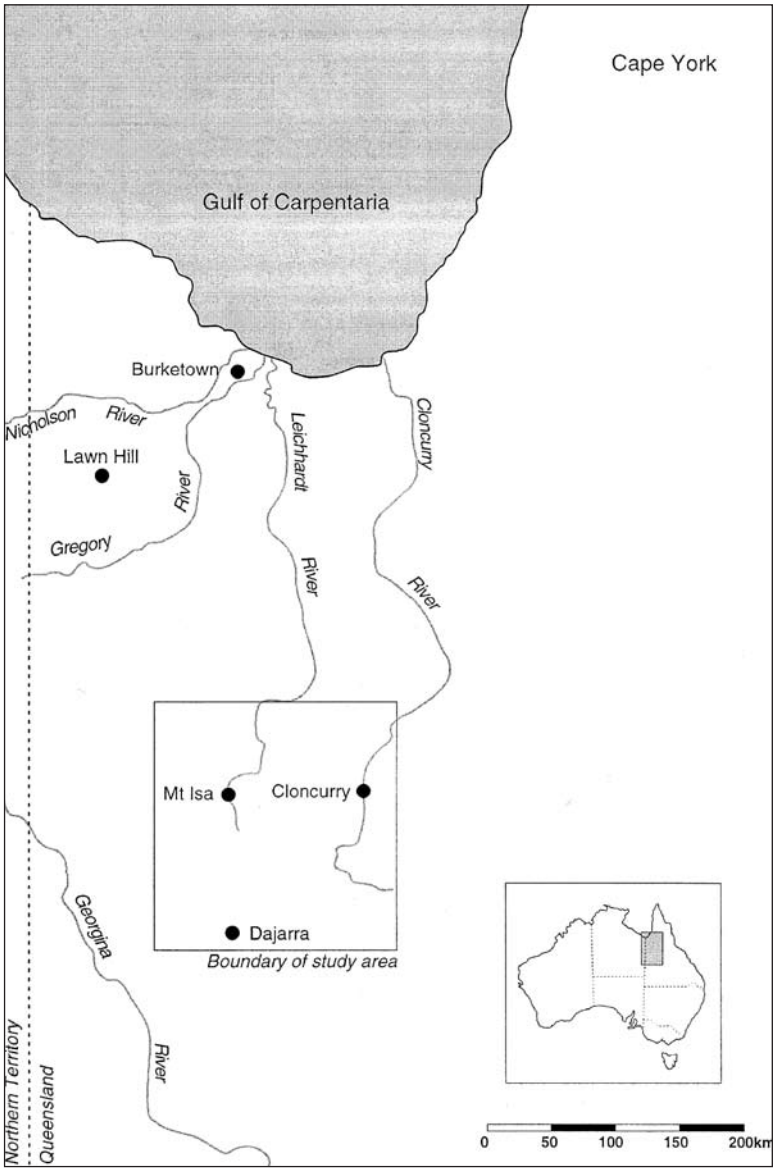

Figure 1. Study area, Northwest central Queensland, Australia.
Área de estudio, noroeste de Queensland central, Australia.

produced sometime over the last 1,000 years. Taken together, it is evident that the anthropomorphic motifs were produced in a discrete bounded area in the relatively recent past.

Wiessner (1983:259) has argued that archaeologically, styles which have a discrete distribution like the anthropomorphic motif are likely to be "emblemic". By this she means that the style will be a direct referent for a group or organisation so its distribution would be limited to locations where communication concerning group identity is being signalled. Further, Wobst (1977) has predicted that if a stylistic artefact is standardised and differentiated from that of a neighbouring group it is likely to be related to boundary maintenance. If this is the case, the patterning evident in the distribution of the anthropomorphic motifs in northwest central Queensland suggests that the motif is likely to have played a role in group identification associated with boundary maintenance.

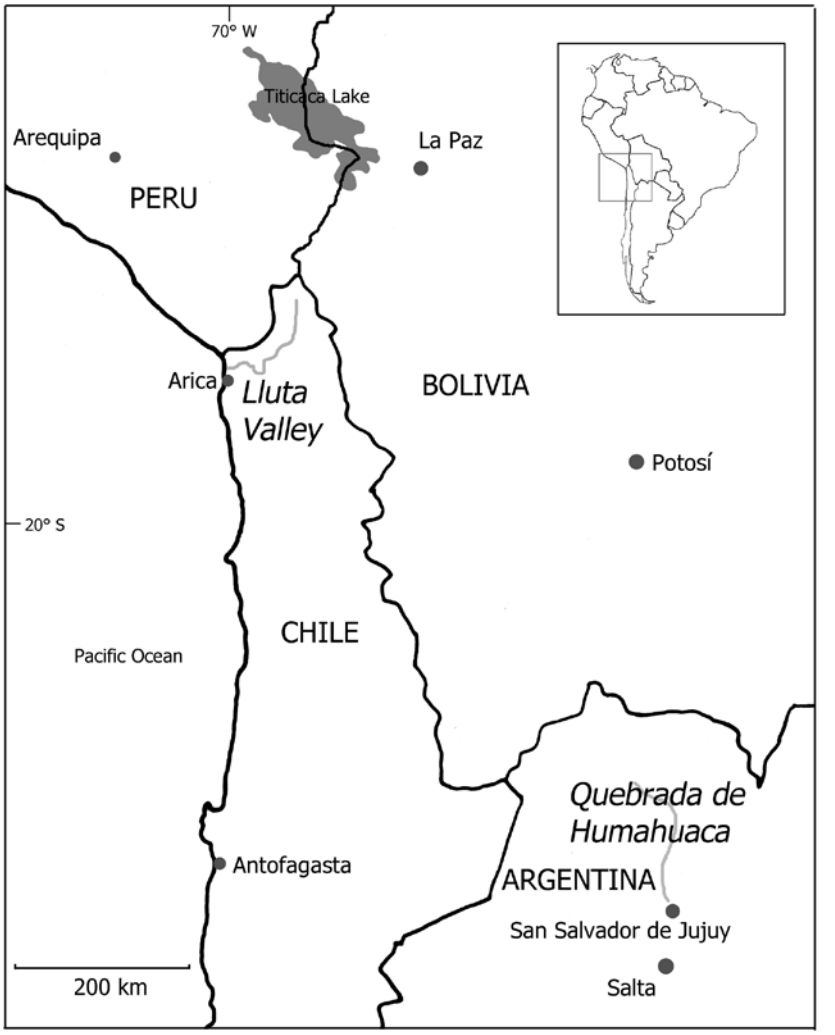

Figure 2. Study areas, Lluta Valley, Northern Chile and Quebrada de Humahuaca, Northwest Argentina, in South Central Andes.
Áreas de estudio, valle de Lluta, norte de Chile y Quebrada de Humahuaca, Noroeste Argentino, Andes Centro Sur.

Additionally, Wiessner (1984:277) states that a given style has to be used frequently enough in any given context to develop common associations for all group members. In this study, the primary motif appears at least 310 times at 60 open and rockshelter sites, on vertical rock surfaces distributed widely across the region, marking the landscape in a cohesive block (Davidson et al. 2005; Ross 1997).

Further analyses of the relationships between the art and the contexts of its production as outlined above revealed additional patterning. The anthropomorphic motifs have been painted in two standardised and related, but idiosyncratic styles. The first group, classified as Basic Motifs, are small (< 459 mm high) monochrome figures (most commonly red or dark red) depicted in full frontal position with bi-lateral symmetry, orientated vertically, bodies are elongated, shoulders are curved and arms positioned out and down, and legs are splayed (Figure 3). Basic Motifs display only the minimum visual requirements for immediate recognition. Feet, hands, facial features and headdresses are rarely depicted. The second group of motifs classified as Detailed Motifs (Figure 4), conform to the same basic morphology but each has been elaborated with additional features. They are large (up to 1,580 mm

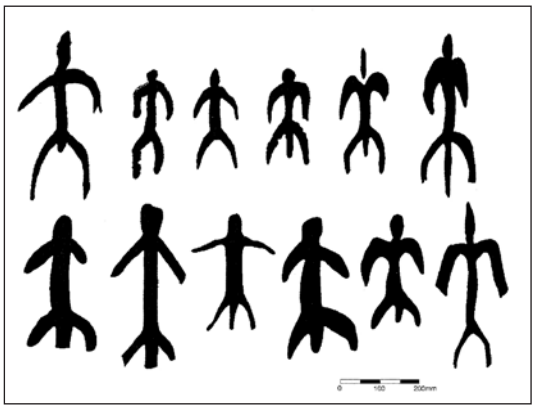

Figure 3. Basic Motifs, Northwest central Queensland.
Motivos Básicos, noroeste de Queensland central.

high), bi-chrome or poly-chrome figures that incorporate additional details such as outlines, dramatic headdresses, hands, feet, facial features and body decorations. The presence of detailed decoration in the latter group holds the potential to differentiate one motif from another providing an opportunity for the producer to communicate a further level of significant information.

The difference in form between these two groups of anthropomorphic motifs suggests that they may communicate different information and that the analysis of the way in which they are related to geographic and cultural contexts may provide an explanation for the way in which each was used in mediating social outcomes. Statistical analyses (χ^2) demonstrated that Detailed Motifs showed a highly significant association with reliable water sources, while Basic Motifs showed a highly significant relationship with rockshelters (Ross 1997).

Further, 87% (n = 47) of Detailed Motifs were classified as highly visible (i.e. large size, painted on a vertical surface in a prominent location within the site) while none of the Basic Motifs fitted into this class. This non-random pattern is highly significant as Wobst (1977) predicted that the types of material culture in which stylistic form is likely to be found are artefacts that could be seen from a distance. He further states that the likelihood of such an item being seen by a large number of people would increase its desirability as a messaging agent and its potential to broadcast group affiliation. The high visibility of Detailed Motifs and their placement at reliable water sources ensured that they would provide ideal messaging agents.

Discussion

The co-occurrence of the emergence of a distinctive art style and a distinctive language (e.g. Blake 1988:46) in northwest central Queensland and a

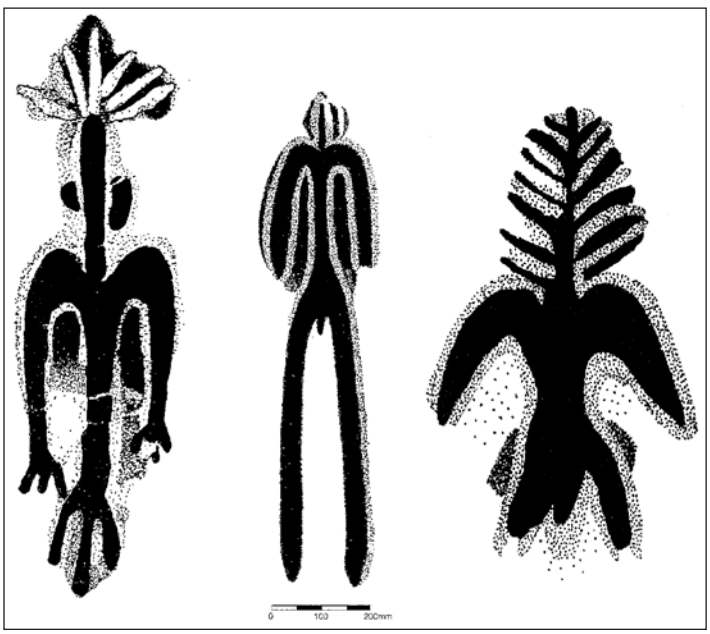

Figure 4. Detailed Motifs, Northwest central Queensland.
Motivos Detallados, noroeste de Queensland central.

number of other regionally specific archaeological features suggests that there are a number of interlocking components that people in the region utilised in the development of regional social strategies.

Ethnographic records documenting traditional trade provide additional information about social interaction amongst past populations in the area (e.g. Roth 1897). Prehistoric and post contact trading or customary exchange networks are well documented in northwest central Queensland with goods exchanged being prized, not only for their economic value, but for the social and ritual ties that the operation of such networks created and facilitated (McBryde and Harrison 1981; McCarthy 1939). In many areas, particularly in deserts, trade routes followed major river drainage lines or chains of waterholes along "rigidly prescribed paths" (Roth 1897:132). These paths or tracks however, are conceptual linkages rather than physically formed compacted paths. In fact, routes between significant water might vary according to the seasonal availability of resources along the way but all tracks would include stopovers at reliable water sources. The routes figured prominently in Aboriginal mythologies describing the travels of Ancestral Beings and are know as Dreaming tracks (McBryde 1987). Each local group through whose territory the Dreaming track passed, owned a part of the total story associated with the more extensive Dreaming track (Morphy 1991). Thus the Dreaming tracks provided predictable patterns of human movement and economic activity within the landscape.

Two trade items played a particularly significant role in exchange in the study area. The narcotic drug, pituri (*Duboisia hopwoodii*) was traded from the channel country in the south into northwest central Queensland (Watson 1983) and in return, axe heads of dark green dolerite extracted from quarries within the study area were traded many hundreds of kilometres to the south where such dense raw material was not available (Hiscock 1988b). The development of extensive trading networks would have increased the *interaction* between the people occupying the area around the quarries and those from neigbouring groups to the south. The pressure from outsiders anxious to utilise a scarce and valuable resource may have necessitated the limiting of access to the dolerite quarries in the study area. Hunter-gatherers have adopted a number of strategies in other parts of Australia in order to control access to quarries during their necessary absences. These include limiting rights to mine to those who have the correct kinship affiliation in relation to the owners (McBryde 1984) or by recounting myths encoding warnings of the dire consequences and ritual danger of approaching areas where scarce resources are found (Jones and White 1988:84; Tindale 1974:87).

Further evidence of trade can be gained from the analysis of stone artefact manufacture and distribution throughout the region (Hiscock 1988a; McBryde 1987). Standardisation has been employed as a key variable in the archaeological identification of trade-related stone artefact manufacture (e.g. Torrence 1986). Axe forms from quarries within northwest central Queensland were found to be standardised in both production technique and form with stockpiles of finished goods still evident at quarry sites (Hiscock 1988a:9). Similarly, the caching of standardised but unused artefacts hidden and stored in numbers in access of a single person's requirement were found in the study area, suggesting stockpiles set aside until favourable trading partners arrived (Hiscock 1988b: 66-67). Supporting evidence from archaeological excavations (e.g. Davidson et al. 1992; Hiscock 1988b) indicate that such standardised articles and distinctive raw materials were not incorporated into stratified deposits until after 1,000 BP. It therefore appears likely that the introduction of large scale trading networks associated with increased social interaction, also has a relatively recent origin as does the art.

Conkey (1980:230) has argued that style which refers to social group would first be used "with the appearance of non-continuous components in the human social world" or "the need for dealing with boundaries per se". The development of extensive large scale trading networks would provide such a "non-continuous component" and would provide a social environment where frequent or intensive comparison between the local group and outside group occurred (Wiessner 1984:227). Additionally, the need to develop a cohesive strategy for dealing with the increased interaction would be required. A sense of group apprehension may have necessitated the formulation of a strong group identity and cohesion and the need to differentiate insiders from outsiders (Wiessner 1988:59).

By presenting a standardised image to outsiders, a distinctive rock art style would have provided a means of emphasising the unity between the small localised bands which traditionally made up regional

Aboriginal groups in the past within Australia. Further, the territory of the resident hunter-gatherer group would be clearly marked so that even in the absence of the owners, the outsiders would be notified that some modification in behaviour was required. In this way, the distinctive anthropomorphic motifs act as a mechanism, which mediates between the producer group and the viewing group. If the people viewing the art belong to an owning group, the art communicates a message about alliance and cohesion (e.g. Gamble 1991). Alternatively, if the viewers are from an outside group, the art may communicate a message about required behaviour and the need to cooperate if desired goals are to be achieved. Viewed in this way, the anthropomorphic motifs can be seen as a tool in the negotiation of social interaction. The art style signals that a range of behaviour is required and, if such behaviour is adopted, social exchange can proceed effectively. Thus the art provides some measure of assurance for the producing group, as the behaviour of any outside group is likely to be constrained in required ways thus making interaction more predictable.

The placement of Detailed Motifs at reliable water sources ensured that outsiders using rigidly prescribed paths or trade routes linking rivers (often nothing more than an occasional muddy pool) and waterholes would receive the messages even in the absence of the owners. In arid northwest central Queensland, reliable water sources would have been a scarce but vital resource for any gathering of people. The combined effects of the dominant placement and large scale of the Detailed Motifs and, in many cases, the repetition of the motif, created a striking signal that would have been seen by anyone approaching the sites. The increased interaction resulting from trade with outsiders would provide the rationale for marking territory. The visitors' knowledge of the axe resources and trade routes indicates that they were not so distant in their social interaction with the owners that they were unable to understand the message encoded in the artistic system (Wobst 1977:325).

Wiessner (1984:193) has demonstrated that different degrees of stylistic variation and similarity can be juggled in order to mediate more subtle social relationships. If style can project several aspects of identity at once, then it is quite feasible that the two groups of anthropomorphic motifs in the art assemblage might be providing a mechanism to express interrelated aspects of identity. Wiessner argues that it is the context of production, which is likely to provide information on the type of social behaviour that initiated the stylistic variations.

In contrast to the Detailed Motifs, Basic Motifs were frequently produced in much less public contexts, many in elevated rockshelters, in sites with evidence of general habitation away from reliable water. These locations are likely to be passed unnoticed by groups travelling into the area for trade. The small form and the unobtrusive context in which many of the Basic Motifs were produced points to their use as messaging agents intended for those familiar with the less easily accessed localities. While simplicity is not a measure of the amount of information that can be encoded in a motif (see Morphy 1991; Munn 1973), the ability to decode the information in a simple motif implies that the viewer has a close understanding of the arbitrary conventions governing the production of the motif. The form of these motifs is generally similar across the region suggesting a regional understanding with Basic Motifs being used as a marker of group affiliation.

Increased social interaction resulting from the opening up of extensive large scale trading networks throughout western Queensland produced an uneven relationship between those groups with access to scarce resources and those without. Pressure created by the demand for a scarce and valued resource necessitated a mechanism which not only bound the territory containing the resource with a group identity, but signified that in acknowledging the group identity, outsiders would moderate their behaviour in some manner thus reducing the threat to the owners. This would have made interaction on both sides more predictable and allowed for exchange to proceed for the mutual benefit of all.

Travellers following trade routes would have encountered visual displays of group identity at reliable water sources. While conforming to the overall conventions, these motifs provided a mechanism for individuals or small groups to display their affiliations to the locale in a complementary way, without endangering the overarching affiliation to the larger social group. Another part of the art assemblage, more highly standardised in form and located in contexts unlikely to be used by travellers, provided a tool for the local inhabitants to signify their affiliation to the broader regional social group.

Example 2: The geoglyphs of Lluta Valley-Northern Chile

Rock art in the Lluta Valley comprises large figures formed as geoglyphs displayed on the ground (covering from 15 m^2 up to 70 m^2) probably constructed during the Late Intermediate and Late periods (ca. 1,000-500 BP). There are 17 geoglyph sites comprising 23 panels, composed of 108 recognisable figures. All are located in the lower reaches of the valley in the Coastal Sector (from the mouth of the river excluding the Littoral Sector, west 10 km to about 250 m asl) and the Fertile Sector of the valley (10 - 35 km, to about 950 m asl, see Figure 5). No geoglyphs were constructed in the higher more barren reaches of the valley, east of the Fertile Sector.

The "Lluta style" of geoglyphs (Briones et al. 2007; Dauelsberg et al. 1975) is characterised by standardised, schematic and geometric depictions, with an emphasis on rectilinear shapes. The predominant motif is an anthropomorphic figure (58%, n = 63) depicted with rectangular or semi-rectangular body, legs and headdress (Figure 6) with fewer zoomorphic motifs (35%, n = 38), mainly schematic rectilinear camelids. All motifs were created by using an additive technique where the contrast between the dark clustered stones placed over the lighter natural earth background produced in-filled figures in positive, high relief (Briones 1984). The large format of the geoglyphs (average motif size 43 m^2) means that they could have been seen from a great distance.

The style of the geoglyphs in the Lluta Valley generally differs from that adopted in the production of the engraved or painted assemblages within the valley or further east on the *altiplano* (high plateau). Significantly, the geoglyphs are also stylistically different from those found in other regions of Northern Chile, the exception being a small number of similar geoglyph sites close by in the adjacent Azapa Valley and a single engravings site in the Lluta Valley itself. Therefore, the geoglyphs produced in the Lluta Valley in the relatively recent past are repeated and internally homogeneous, while differing stylistically to art assemblages in the surrounding regions.

Wiessner (1984) argues that it is the context of production, which is likely to provide information on the type of social behaviour that initiated the stylistic variations (see also Dobres and Hoffman 1994; Gell 1999). Analysis of the topographic location of geoglyphs also reveals a consistent pattern. All geoglyphs are located on the upper section of the valley slopes, far above habitation and agricultural areas in what is a barren landscape. The geoglyphs therefore, were produced in what Berenguer (2004) has called "empty spaces" or places where viewing opportunities were maximised, and where few other activities are likely to have taken place.

The size, orientation and technique of production also ensured that the motifs were highly visible. Their construction on the high slopes of the valley rather than on the horizontal valley floor meant that the geoglyphs could be seen from multiple viewpoints. This choice of location is in stark contrast with other stone constructions in the Andes such as the Nasca lines (Aveni 1990; Clarkson 1998) where the geoglyphs are arranged on almost horizontal ground. Further, the additive technique utilised in the construction of the geoglyphs has the advantage of creating a major contrast in the relationship between the darker motifs and the lighter ground on which they have been constructed, ensuring maximum visibility (Briones 1984:44).

Another means to maximise viewing opportunities within the rugged topography of the region has been adopted by the producers of the geoglyphs. A small number of sites (29%, n=5) are associated with a natural pass connecting the Lluta Valley to another valleys and ravines. The pass thus provided a vital geographic nexus for travellers moving between different environmental regions with the topography ensuring that any rock art placed in this area would potentially be seen by all people passing through.

The consistent positioning of geoglyphs on the southern slopes of the valley (82%, n = 14) suggests that geoglyphs were constructed so that they could be viewed across the valley from a particular direction. In addition, the repeated orientation of panels to the north and northeast means that the geoglyphs would have been highly visible to people travelling *from the west to the east* – i.e. from the Andean *altiplano* towards the Pacific coast. It is evident that the producers of the geoglyphs made particular choices about the creation and placement of the panels to ensure that the rock art acted an ideal messaging agent (Wobst 1977).

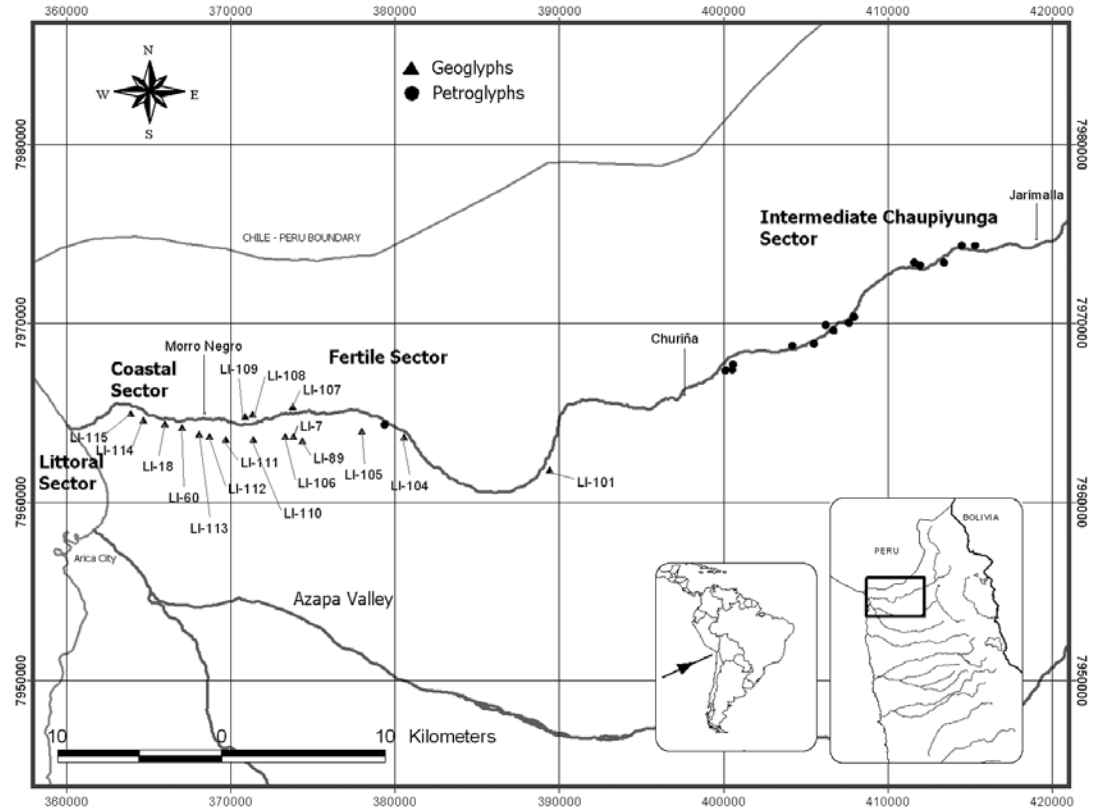

Figure 5. Location of geoglyphs of Lluta, in the Coastal and Fertile sectors (map elaborated by Rolando Ajata).
Localización de geoglifos en los sectores Costero y Fértil del valle de Lluta (Mapa elaborado por Rolando Ajata).

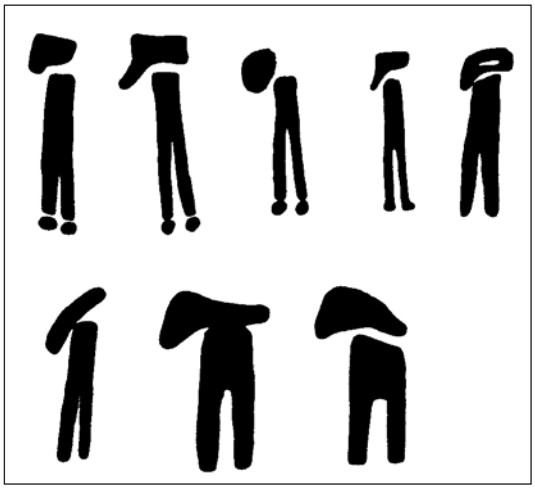

Figure 6. Typical anthropomorphic figure of Lluta style, depicted with rectangular or semi-rectangular body, legs and headdress.
Figura antropomorfa típica del estilo Lluta, compuesta por cuerpo, extremidades y tocado cefálico de formas rectangulares o semi-rectangulares.

An analysis of relationships between the archaeological evidence associated with the geoglyphs, and the topography of the region in which they have been produced provides additional clues to their function in the past. Archaeological features directly associated with the geoglyphs are limited to trails created by past human and animal traffic (Figure 7) that pass all but one (94%, n = 16) of the Lluta Valley geoglyph sites. The spatial relationship between rock art and travel routes has been widely recognised in northern Chile (e.g. Briones 2006; Briones et al. 2005; Clarkson and Briones 2001; Sepúlveda et al. 2005) including the Lluta Valley (Muñoz and Briones 1996) – an idea originally proposed by Núñez (1962:46, 1976, see also 1985). These paths (sensu Earle 1991)[1] formed a route (Muñoz and Briones 1996) from the *altiplano* into the northern reaches of the Lluta Valley, and continued in an east-westerly direction to reach the coast (Littoral Sector) at present-day Arica. The

route comprised several tracks and secondary paths when crossing flatter land (known as a rake-type path), but tended to form one single track on steeper terrain[2]. There is no archaeological evidence of planned construction. Rather, the tracks appear to have been formed and compacted by repeated animal and human use over a considerable period of time. The main interregional route ran approximately 150 km linking different ecological regions. However, the route did not pass or link local settlements within the Lluta Valley. Instead, local settlements in the valley were connected by secondary intra-valley paths (Schreiber 1991) that were bifurcations of the principal route.

Archaeological evidence from sites within the Lluta Valley provides information on the timing of exchange activities and the social and cultural contexts of the groups participating in the lama caravan journeys. Several lines of archaeological evidence indicate that exchange took place in the Lluta Valley (particularly in the Fertile Sector) during the Late Intermediate and Late periods. The most significant evidence is the increased presence of foreign goods in the archaeological record from this period when compared to deposits from earlier periods (Hidalgo and Santoro 2001; Santoro 1995, 2001; Schiapaccasse et al. 1989). Based on this evidence, there is now a general acceptance that the Late Intermediate and Late periods were times of high mobility and increased caravan traffic in the South-Central Andes (Berenguer 2004; Schiappacasse et al. 1989; Santoro 1995; Santoro et al. 2007). Santoro (1995) describes excavated items from local habitation settlements in the Lluta Valley containing foreign items from distant regions including the eastern slopes of the Andes, the coast of Peru, Ecuador, but most particularly from the *altiplano* where items including feathers, pigments, volcanic glass, copper and dehydrated potato originated.

Figure 7. Aerial vision showing archaeological trail created by past human and animal traffic, associated with the geoglyphs. Site Lluta-111, panel 11.
Vista aérea que muestra sendero arqueológico asociado a los geoglifos producido por el tráfico de animales y personas. Sitio Lluta 111, panel 11.

A further indicator of increased human interaction and exchange can be gleaned from the subject matter depicted in the rock engravings in Lluta Valley (Valenzuela 2004). Direct evidence of highland caravan traffic is apparent in the production of highland camelid motifs and depictions of lama caravans, some being led by humans (known as *caravaneros*). Additionally, the introduction of motifs more common in the highlands such as birth figures, have been recorded in sites of the Fertile Sector of the Lluta Valley. Depictions of seamen documented at sites in the same sector (Valenzuela 2004) provide additional evidence of increased human interaction between the highlands and the coastal fringe.

Specific evidence of caravan activities has also been recovered from archaeological sites in the wider Atacama region. Berenguer (2004) indicates that evidence of the presence of caravan activities include caravan kit (tie hooks, ropes, cowbells, etc.), the skeletal remains of cargo lama, rest stops separated by 20-25 km, as well as location of rock art images showing caravan lamas. However, in exoreic valleys, and specifically in the Lluta Valley, such direct evidence is lacking (see Berenguer 2004:109, 539)[3]. Although some lamas skeletons have been found in Lluta Valley excavations (Santoro 1995), none have been identified as belonging to cargo lamas. Muñoz (1981) identified lama corrals in the Azapa Valley based on presence of guano concentrations. The evidence of the presence of lamas in the Lluta Valley is likely to reflect the sporadic use of these animals for cultivating or alternatively, some skeletons may indicate the presence of rest-stops along the caravan route. The lack of readily available water and grass in the Lluta Valley excludes the possibility that lamas were used for pastoral purposes.

The most significant evidence for increased mobility and exchange in the Lluta Valley are the paths themselves. The path provides physical evidence of past traffic and the resulting interaction that occurred (Berenguer 2004, 2005). The length of the route, which extends for 150 km, adds to the probability that people transporting a wide variety of goods would have utilised the carrying capacity of available highland pack animals.

Analysis of the physical and social contexts in which the geoglyphs were produced suggests that they functioned as visual tools to legitimise the highland peoples' access to coastal resources and facilitated exchange.

Discussion

Multiple lines of evidence indicate that the geoglyphs were produced to be viewed by people moving down from the highlands to the coast in order to trade. Implicit in this conclusion is the understanding that the trade was instigated by highlanders rather than by coastal people. Additional evidence supports this conclusion: First, there is no evidence of caravan kit in local archaeological sites, which suggests that the local populations of the Lluta Valley were not caravan people. Second, ethnographic data indicate that the highlanders who undertook the caravan trips were also herders (Berenguer 2004; Custred 1974), an activity restricted to the highlands. Taken together, these factors explain why trade goods are found in local archaeological deposits, while caravan kit is not. Third, the consistent positioning of geoglyphs on the southern slope of hillsides and their orientation to the north-east, and their location close to travel routes indicate that the geoglyphs were constructed to be viewed by people travelling *down* towards the coast. Finally, both the principal path and the secondary paths follow a similar route directed towards to the coast of present day Arica indicating that the coast is the primary goal of the route.

The final destination of the highlanders was the Littoral Sector, rather than the Fertile and Coastal Sectors of the Lluta Valley where the geoglyphs are located (see Figure 5). The Coastal Sector of the valley had few economic resources of significant value and was occupied by transitory fishermen who relied on littoral resources (Santoro et al. 2007). Why then were the geoglyphs created in the Fertile and Coastal Sectors of the valley if the desired destination of the highlanders was the Littoral Sector? The uni-cultural ceramic component of the archaeological record from the Coastal Sector (Santoro et al. 2007) indicates that the area was unlikely to be an aggregation or exchange site, probably due to the lack of economic resources of any great value and the low population density. Rather, the geoglyphs marked a critical inter-nodal space through which travellers needed to pass in order to reach the Littoral Sector where they could obtain valued exchange resources. It is in the middle sectors of the valley that the highlanders with their lama caravans are likely to have been seen as interlopers and potentially met with hostile reactions (e.g. Berenguer 2004; Harris 1985).

The form, and the social and physical contexts of production of the geoglyphs indicate that they are likely to have played a role in symbolically marking the *most significant nexus* between the coast and the *altiplano*. Increased social interaction resulting from the introduction of lama caravan traffic would have produced an uneven relationship between groups from the *altiplano* and those from within the Lluta Valley, a situation where Conkey (1989) suggests, stylistic behaviour differentiating those threatened from those perceived as interlopers is likely to be identified.

The Littoral Sector offered economic resources unavailable in the highlands such as fish, algae and seabird guano. Ethnohistorical references record the importance of these resources to highland populations and document the regular traffic associated with them during colonial times (Hidalgo and Focacci 1986; Julien 1985; Masuda 1985; Rostworowski 1986; Vázquez de Espinosa 1948 [1628-1629]). Furthermore, other resources such as shellfish, starfish and seawater held (and continue to hold) symbolic value for Andean populations (Farfán 2002; Martínez 1976; Murra 1975; Sherbondy 1982). The relative abundance of economic resources and greater population density in the Fertile Sector of the Lluta Valley compared to the other sectors of the valley (Santoro et al. 2007) means that this sector was likely to have functioned as the area where exchange took place. Archaeological excavations in the Fertile Sector reveal permanent habitation sites with more physical infrastructure and evidence of agricultural practices. Here, highlanders with their lama caravans could exchange their highland products for local agricultural products. Also, the caravans could have crossed from here to the Azapa Valley by way of the bifurcated routes that are known to have existed. In contrast to the Coastal Sector, multicultural archaeological evidence has been recovered from the Fertile Sector, supporting the conclusion that this sector functioned as an area of exchange (Santoro et al. 2007).

Pressure created by the arrival of outsiders into the Lluta Valley necessitated a mechanism which, not only identified differences between the resident group and the visiting group, but flagged local group identity to outsiders thus reducing the threat to the resident group. This would have made interaction on both sides more predictable and allowed for exchange to proceed for the mutual benefit of all. We suggest that the geoglyphs in the Lluta Valley provided such a mechanism.

Example 3: Quebrada de Humahuaca - Northwest Argentina

From ca. 2,000-1,000 BP, a painted rock art assemblage was produced in the Quebrada de Humahuaca, which was stylistically different from previous rock art recorded in the area. The assemblage is comprised of elaborate figurative motifs depicting lamas and humans, usually formed into compositions of multiple elements (up to 20) such as lama strings or rows of humans. Figures are painted in profile with body parts and clothing accurately depicted (Hernández Llosas and Podestá 1985). In addition to the repeated association between human figures and lamas, geometric motifs are frequently added to panels (Figure 8). The average size of the motifs is small (30-50 mm high) with panels applied to the rock surface in a linear manner using an extremely fine brush and red, white, black and yellow pigments creating delicate poly-chrome figures.

This style of rock art has been recorded at 11 sites throughout the valley with an average of three to four panels of paintings produced within each site. The panels of small composite motifs are the only rock art present at most of the sites although two sites have had later styles superimposed over the elaborate figurative motifs. Panels at four sites, Chayamayoc (Fernández Distel 1983a), Alero el Morado (Fernández 2000), Kollpayoc (Nielsen 2001) and Inca Cueva 1 (Hernández Llosas 2001) depict vivid scenes of confrontation between two different groups of people who can be identified by their distinctive attire (Figure 9). Panels at the other seven include depictions of humans who appear to be performing some sort of formal ceremony or activity (Fernández Distel 1983b; Hernández Llosas 2001). They carry weapons and other objects of material culture and lamas and geometric motifs complete the compositions. In nine of the eleven sites, the artists have intentionally selected disconformities on the rock substrate on which to paint, in order to dramatise the visual composition of the panel.

A sample from the organic fraction of the black pigment from one of the panels was dated using AMS radiocarbon techniques. The sample was taken from an area of pigment depicting clothing on a human figure, which formed part of a line of six

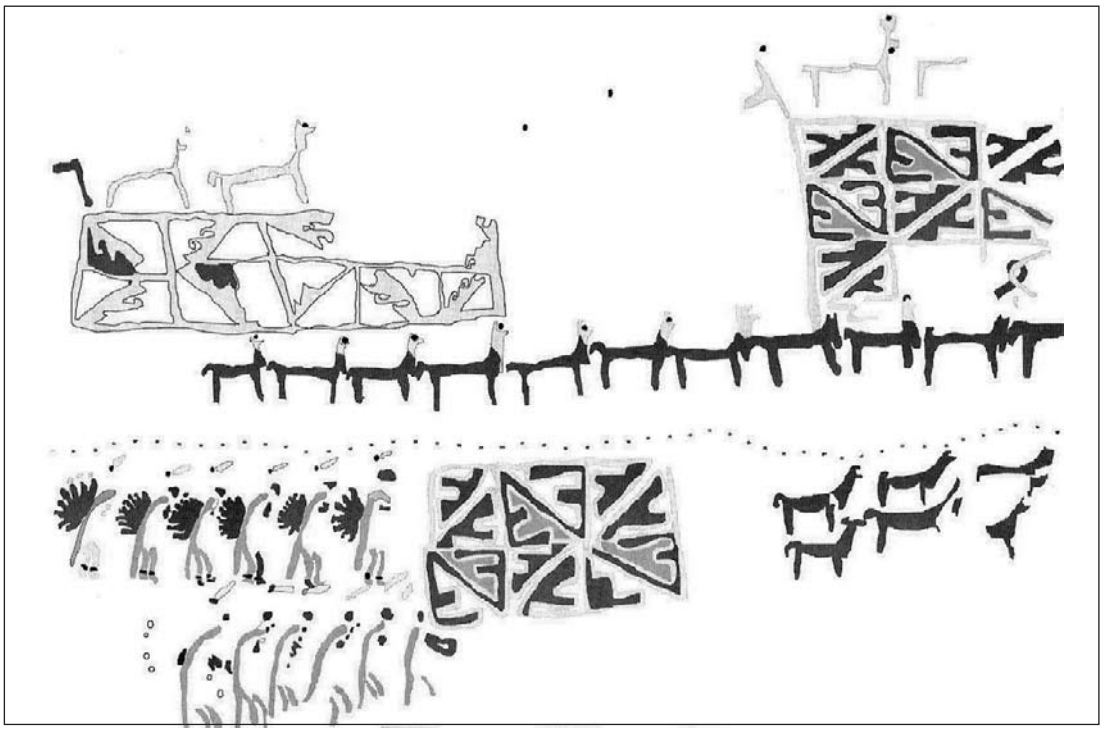

Figure 8. Media Agua 1, GT 2 (Hernández Llosas 1998).
Sitio Media Agua 1, GT 2 (Hernández Llosas 1998).

similar figures at the site known as Media Agua 1. The results provide a direct date of 1,800+/-110 BP, un-calibrated (CAMS 25383), (1,735 BP calibrated and 1879-1615 with 1 sigma) for the style described above (see Hernández Llosas et al. 1998, 1999, for details and discussion). The stylistic similarity between the dated motif at Media Agua 1 and other rock art assemblages throughout the valley and the adjacent Puna region has resulted in the style being named the Media Agua Stylistic Group (Hernández Llosas 2001).

The majority of the motifs were painted on nine small rocky outcrops that afforded little protection from the elements, while others were produced on the walls of two rockshelters. The outcrops and rockshelters selected for the production of rock art are all above 3,000 m asl, where pasture and water resources were relatively plentiful making the area suitable for pastoral practices. While not directly associated with habitation sites, all rock art sites are located within reach of dispersed villages and inside the radius of boundaries expected for extended herding territories. By locating the Media Agua Stylistic Group away from everyday domestic activity and major travel routes, and then choosing to produce the motifs on a small scale, the artists would have *limited* both the number and nature of potential viewers.

Archaeological evidence recovered from habitation sites in the valley (e.g. Basilico 1992, 1994; Hernández Llosas et al. 1983; Olivera and Palma 1997; Zaburlin et al. 1994) shows that from ca 2,000 - 1,000 BP management of farming and herding territories was being consolidated with a concomitant development of dispersed villages throughout the region. Data from excavated sites indicate an increase in practices associated with food production and related changes in land use. An increase in the amount of domesticated lama bone and associated artefacts indicates an intensification of herding practices, while developments in farming practices are flagged by the extension of agricultural fields. These economic changes are associated with the construction of larger villages, different in structure to those built in earlier times.

A number of ceramic pipes, some containing hallucinogenic substances were recovered in

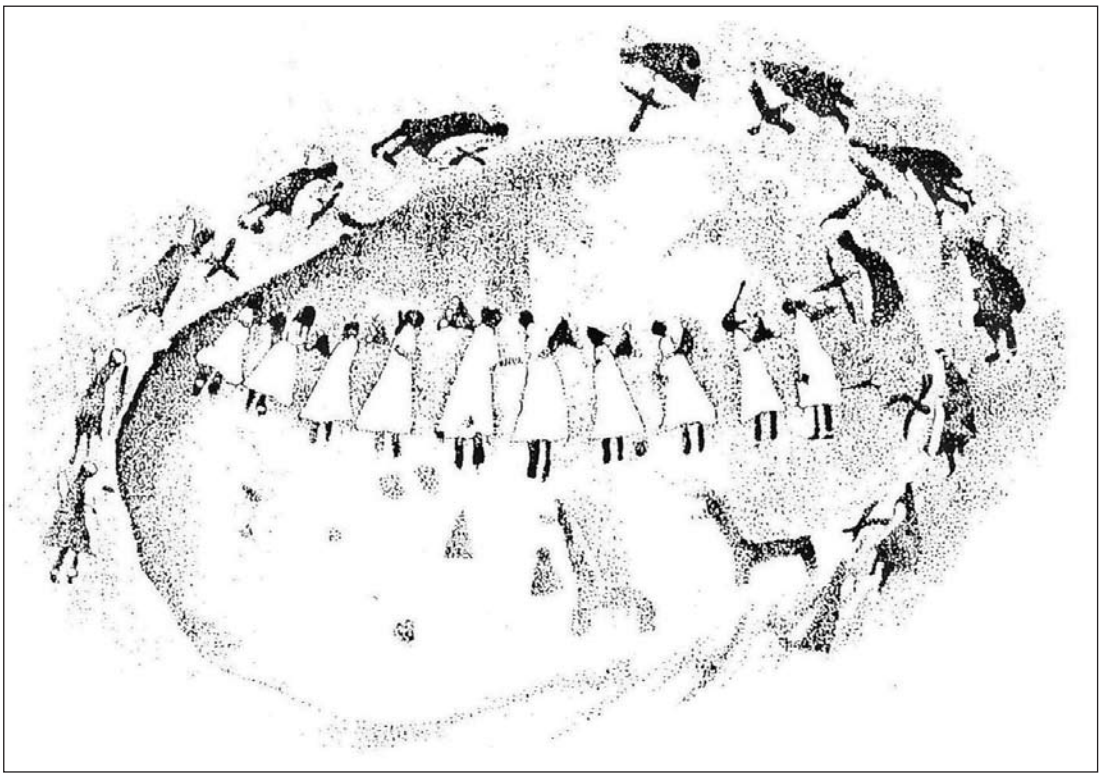

Figure 9. Alero El Morado (Fernández 2000: Fig.17:112).
Sitio Alero El Morado (Fernández 2000: Fig.17:112).

deposits from excavated habitation sites. Such pipes held great social and ceremonial importance in northwest Argentina in the past (Tartusi and Núñez Regueiro 2001). A similar pipe has been depicted in the hands of the leading human figure on the main panel at Media Agua 1. As the line of figures is associated with a line of lamas, we could speculate that the scene depicts ceremonial practices connected with herding.

Discussion

The archaeological record indicates that around 2,000-1,000 BP, herding was the predominant pastoral pursuit in the Quebrada de Humahuaca. The parallel between archaeological evidence signalling an increase in the number of domesticated lamas alongside the selection of lamas as the subject of much of the emerging art of the same period underlines the rising economic and ideological importance of this animal to the people of the region. Due to the arid environment, the intensification of herding practices led to conflict in the struggle to set up, maintain and extend herding territories. At the same time, the first images of conflict make their appearance in the rock art together with other themes that link humans and lamas with object of a ceremonial nature such as pipes, elaborate clothing and geometric compositions.

The location of the sites along with the subject matter depicted in the Media Agua Stylistic Group suggest that they could have been playing a multi-purpose role and encoding different messages for different audiences, at different intra and inter group scale: marking territories, commemorating past events (battles and encounters) and/or being used to as part as the performance of ritual ceremonies (Figures 8 and 9; see also Hernández Llosas 2001).

Finally, the isolation of the sites and the small size of the motifs created an assemblage with low visibility suggesting that the messages encoded in the art were intended for an internal audience who was familiar with the area and the locations where the art was found. Those producing and viewing

the art then probably belonged to these societies with herding as their main economic activity. The homogeneous nature of the Media Agua Stylistic Group indicates that the audience was likely to be from a cultural group with similar cultural practices who may or may not have been competing for resources. The rock art then could be expected to have functioned as a tool to bond and reassure groups in times of social change or mark boundaries amongst rival groups.

The contrast between the high visibility of the art assemblages described in the two previous examples from Australia and Chile, and the low visibility of the Media Agua Stylistic Group from Argentina suggests that the intended audiences differed. In contrast to the small motifs in isolated locations typical of this style, the more recent art in the Quebrada de Humahuaca is placed in highly visible locations alongside trails. Clearly, the later art was intended to be exposed to a far broader audience than that targeted by the Media Agua Stylistic Group. The more recent art is likely to have sort to achieve a very different social outcome no longer related to herding territories but with the emerging elites who were attempting to control the inter-regional trade in order to obtain greater power and validate their new social status.

Conclusion

The three examples outlined above demonstrate a variety of ways that rock art has been used to mediate social interaction in arid regions of the southern hemisphere. In each of the arid regions, competition arose for limited and valued resources: for specialty axe material amongst hunter-gatherers in northwest central Queensland, for guano and other littoral goods amongst the highlanders and the inhabitants of the Lluta Valley, and for additional grazing territories amongst the herders of the Quebrada de Humahuaca. In each example, the production of rock art was used as a tool to negotiate newly arising circumstances in order to ensure predictable and desirable economic and social outcomes for the artists' group.

The methods and form used by the respective inhabitants to achieve these outcomes varied in each case study. This, in part, reflects the availability of materials for art production and the topography and environmental conditions in each specific area. In each case, the location of the rock art in relation to scarce and valuable resources, especially water was highly significant as might be expected in regions classified as deserts. In arid northwest Queensland, distinctive painted anthropomorphic figures were placed alongside sparsely located waterholes where outside travellers entering the region to trade would be sure to see them. Similarly, the trails taken by outside traders travelling through the hyper-arid Lluta Valley on the way to the Pacific coast, had to follow the only source of water flowing along the valley floor. Thus, by placing the geoglyphs so that they could be viewed from the trails, the artists ensured that they would be seen by all who passed. In the same way, in the high altitude desert of the Quebrada de Humahuaca, there is a strong relationship between the rock art and water sources. Here, the painted scenes are consistently located near springs or basins with permanent water used by resident groups and their herds and are linked primarily to the management of grazing territory.

The cultural preferences manifested in the three deserts are represented by differences in the choices that each society made in the form and context of the art. This diversity also indicates subtle differences in the ways in which people in the past utilised art to mediate social interaction.

In northwest central Queensland a bounded, distinctive art style emerged as a response to the introduction of long distance trade and exchange amongst hunter-gatherer groups. Here, the rock art assemblage operated on two levels with one part of the assemblage ensuring that travellers following trade routes would encounter visual displays of group identity as they arrived at reliable water sources (Detailed Motifs), while another part of the art assemblage, less conspicuous and more standardised in form, and located in contexts unlikely to be used by travellers, (Basic Motifs) provided a tool for the local inhabitants to signify their affiliation to the broader regional social group.

In the Lluta Valley, analysis of the non-random placement of the geoglyphs, their monumental form, along with their stylistic distinctiveness and their specific spatial arrangement along the route between the *altiplano* and the coast provides clues to their function. The geoglyphs were produced

as a means of legitimating actions, particularly the access of lama caravans from the *altiplano* to the coast and the resources found there. The geoglyphs, then, embody social, political and economical aspirations.

In contrast, increased competition for resources in the Quebrada de Humahuaca led to the production of a very different rock art assemblage. The herders of the rift valley produced small complex panels of figurative motifs on isolated outcrops away from habitation areas, thus restricting the viewing audience to those familiar with the area. These panels played several roles: marking grazing territories, commemorating past events and most significantly, as part of the ritual life of the herders.

In studying both the rock art assemblage and the social and environmental contexts in which it was produced, the creation of art can be seen as a powerful social tool which provides a means to reinforce social values, manipulate human behaviour and mediate predictable social interaction.

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Notes

[1] "Paths are informal routes beaten by repeated individual movement of people across the landscape. [They] tend to be highly irregular in layout… [and they] are characteristically redundant, with many alternative routes" (Earle 1991:10).

[2] The chronology of these paths is not deducible directly. However, the close relationships between paths and geoglyphs and sometimes settlements, it is likely they are pre-Hispanic in origin. But it is possible that these paths have been reutilised in post-Hispanic times, within the route Potosí-Arica.

[3] In the Arica region, archaeological deposits contain metal bells, tie-dye rope, and wool sacks (in Museo Arqueológico San Miguel de Azapa's collection), but their relation to caravan activities is doubtful.