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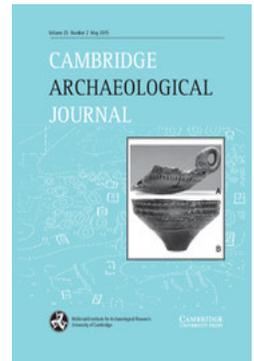
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# Emblems, Leadership, Social Interaction and Early Social Complexity: The Ancient Formative Period (1500 BC–AD 100) in the Desert of Northern Chile

Francisco Gallardo & Gloria Cabello

*Social complexity is synonymous with inequality, a political form whose origin is associated with a reduction in residential mobility, the intensification of production, craft specialization, long-distance exchange, public architecture, the proliferation of prestige goods and ceremonial feasts. Archaeological evidence of these processes, however, is insufficient without the identification of practices related to prehistoric leadership. In the early Andean area, this social distinction was deposited in emblems or insignias of authority, objects of visual prestige whose value resided in myths and divinities. Similar arrangements of material culture, around the first millennium before Christ, appear contextually related with the first village-based communities in Northern Chile.*

Social complexity is synonymous with economic and political inequality, expressed as differential access to strategic communal wealth for social reproduction. Such wealth takes the form of labour and knowledge, food and technological and ceremonial goods (e.g. Arnold 1996a; Flanagan 1989; Paynter 1989). It is generally agreed that complexity in non-state societies appears when the consumption of production is delayed, and this economic process of 'delayed return' leads to a multiplication of actors and decisions affecting the chain of productive/redistributive activities (Meillassoux 1973; Woodburn 1982). From ethnography, we know that human groups that operate within such economic systems often harbour social distinctions that favour the appearance of 'compulsive accumulators' of goods, knowledge or debt, who operate at the tense intersection of personal interest and generosity towards the collective (Godelier & Strathern 1991; Hayden 1990; Johnson & Earle 2000; McGuire & Saitta 1996; Sahlins 1963). Unfortunately, the compulsive psychological traits of these charismatic political leaders are not expressed in the archaeological record, and therefore prehistoric social complexity is instead commonly associated with a reduction in residential mobility, the intensification of production, craft spe-

cialization, long-distance exchange, public architecture, the proliferation of prestige goods and ceremonial feasting (Arnold 1996a; Hayden 1998; 2009; Hayden & Villeneuve 2011; Price & Brown 1985; Silverman 1994; Spielmann 2002; Testart 1982). This conclusion could be considered polemical; indeed, there is more consensus that the most challenging task is to identify archaeological indicators of complexity rather than sets of material practices associated with leadership. This paper will address that issue.

The domestication of llamas as beasts of burden, the appearance of semi-permanent villages and the long-distance exchange that emerged among archaic hunter-gatherer groups in the desert of Northern Chile (4500–1500 BC) have been interpreted as early contributions to the history of social complexity (Cartajena *et al.* 2007; De Souza *et al.* 2010; Mengoni 2008; Núñez & Santoro 2011; Yacobaccio 2004). The features that characterized the subsequent Ancient Formative era (1500 BC–AD 100)—village-based sedentism; architecture for collective use; storage pits; cemetery burials; the use of llama herds; incipient agriculture; increased camelid hunting and wild fruit gathering; the production of copper ore beads; the adoption of ceramic technologies, weaving and metallurgy; and access to

products from distant sources—laid the foundation for a transegalitarian lifestyle that may have been similar to that described during the period of the Spanish conquest, based on small-scale societies without inherited leadership (Adán & Urbina 2007; Agüero & Uribe 2011; Gallardo 2009; Nielsen 2006; Núñez & Dillehay 1995; Núñez *et al.* 2006; 2007; Núñez & Santoro 2011; Rees 1999; Soto 2010; Torres-Rouff, Pimentel & Ugarte 2012). This historic process differs from that which occurred in other Andean regions, where early complexity is associated with larger hunter-gatherer societies that practised agriculture or animal husbandry and built monumental ceremonial architecture (Aldenderfer 2004; Dillehay 2011; Moseley 1975; Shady 2005; Silverman & Isbell 2008).

The surplus economy of this period fostered an extensive network of interregional exchange, and the relations forged were manifested in the proliferation of the image of an anthropomorphic being crowned with a cogged design that has been recorded on different material supports from the Azapa Valley to the Atacama Salt Flat, just over 600 km from the northern Chilean desert (see Cabello & Gallardo 2014). The importance of this supernatural figure with the cogged headdress can be seen not only in the visual imagery of the Formative period, but also among a select group of individuals who wore a bone artefact with a cogged design embedded in the camelid yarn turbans typical of this period (Meighan 1980). In this article, we use these symbolic and social circumstances in proposing that the effectiveness of this mode of early communal production rested upon social inequality, particularly the differential access to ritual knowledge (Aldenderfer 1993). In this kind of practice, one segment of the community was believed to be linked to the supernatural world and publicly displayed emblems also exhibited by figures in the interregional visual imagery (Fig. 1).

### Early complexity and prehistory

The origins of social inequality can be traced back to the pre-Hispanic period, but despite the volume of research available on this topic there is no consensus on the actual causes of this process or even conclusive material evidence (see, e.g., Arnold 1996b; Haas 2001; Price & Brown 1985; Price & Feinman 1995; 2010; Upham 1990). We are referring here to that set of economic, social and symbolic practices that favoured the emergence of leaders associated with communal social reproduction (Vaughn *et al.* 2009).

Archeologically, we know that the minimum conditions needed for the emergence of social complexity are the simultaneous existence of reduction in

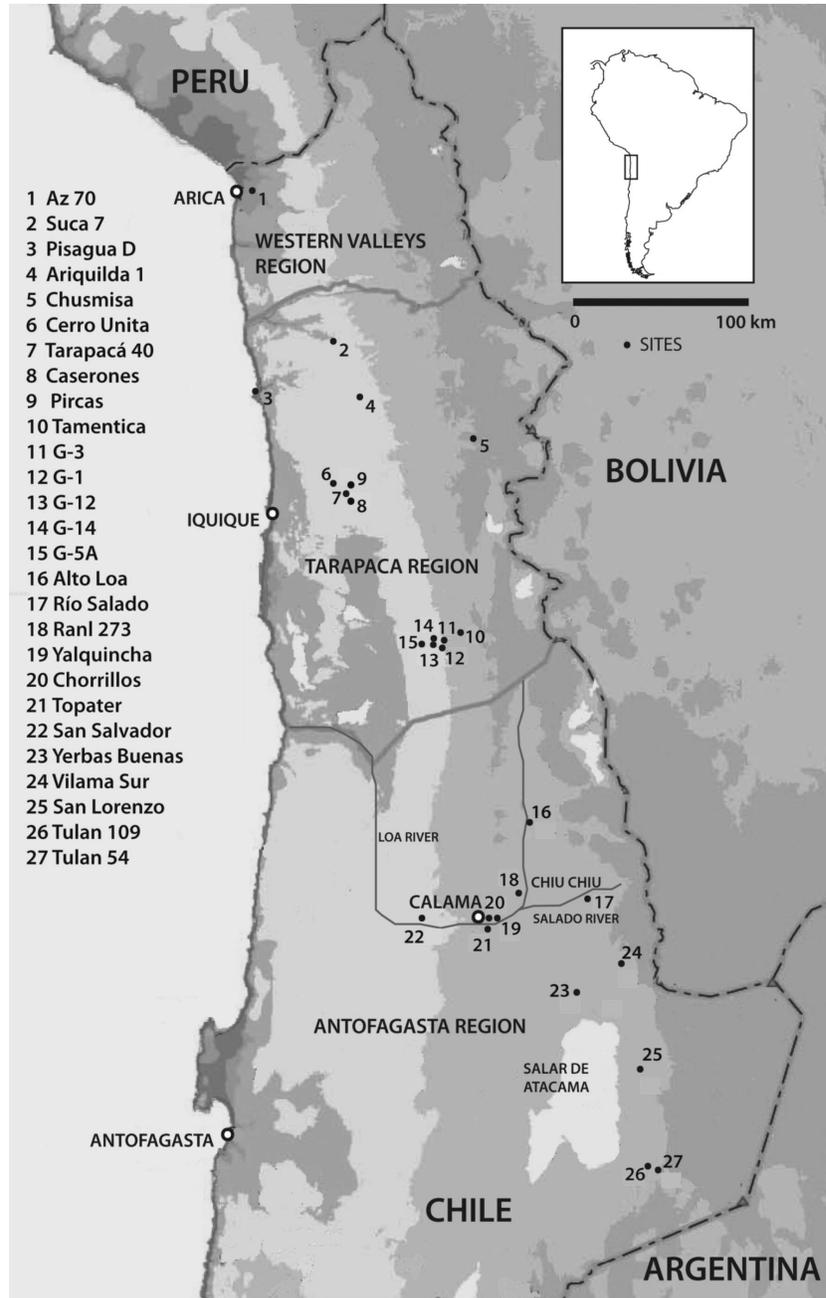
residential mobility, the social division of labour and surplus production. There is consensus regarding the archaeological evidence of such social practices, but, given the importance of the role of collective festivities in political management, these must also include material evidence of spaces created for public use (Dietler & Hayden 2001; Hayden & Villeneuve 2011).

It is in this corporate setting that we undoubtedly witness the emergence of authorities corresponding to the simplest forms of social complexity, leaders that ethnographically inspired archaeologists have described as ambitious, aggressive and acquisitive, capable of mobilizing the workforce and the products of others for their own benefit (Arnold 1995; Hayden 1995). Undoubtedly, archaeological efforts should strive to identify these subjects, who we know did not enjoy special material benefits, but accumulated political capital by practising reciprocity at the community and supracommunity scales (Godelier & Strathern 1991; Hastorf 1990). If these were indeed the leaders that emerged early on, then their participation in extensive social networks must have been prominent, and this certainly would have resulted in relations that were remarkably effective for the acquisition of different types of knowledge (esoteric, technical and social) that were useful for the community's symbolic reproduction.

In different cultures, differences of age, gender, ethnicity, ritual and politics have been expressed distinctively, both visually and materially. In relation to political leadership, these have been linked to insignia or emblems of authority in different class-based and pre-classist social and economic contexts (see, e.g., Brisch 2009; Chang 2009; Cohen 1969; Helms 1981; Kristiansen 2001; Lowie 1960; Peebles & Kus 1977). These forms of visual expression provided a context for political action, and their symbolic effectiveness was usually achieved through collective ceremonies during which the sacred nature of those forms was enacted (Lowman-Vayda 1968; Rappaport 1971).

### Sedentism and early complexity in northern Chile

A village-based way of life associated with agglomerated cemeteries emerged in northern Chile around the middle of the first millennium AD out of social and economic foundations established by archaic hunter-gatherers (4500–1500 BC). These groups have been characterized by a reduction in residential mobility, the intensification of production and the creation of the first herds of domesticated camelids for use as cargo animals for long-distance exchange (Cartajena *et al.* 2007; Núñez & Santoro 2011; Yacobaccio 2004;

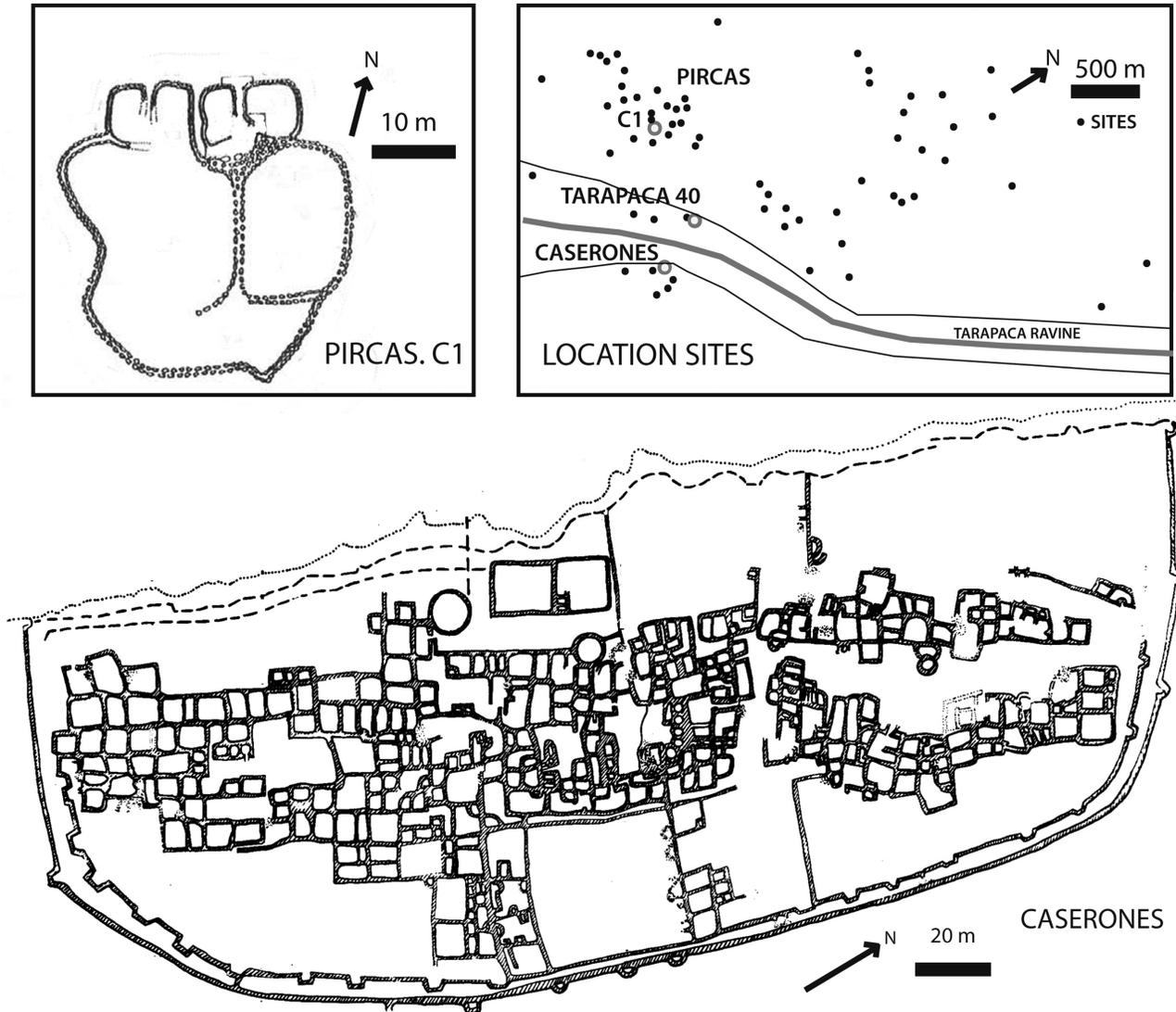


**Figure 1.** Area of study, including Formative sites of northern Chile.

2006). These early villages and collective cemeteries are material expressions of a communal mode of social organization that extended beyond the family unit, and their communality was legitimized in everyday life through residential architecture that promoted social solidarity by linking group members, including deceased ones, together. This affirmation of ancestral coexistence served as an affiliation device that was brought into effect symbolically through the manipulation of bodies—tombs from these times were

marked with thick wooden posts and some individuals bear the marks of the thick ropes used to transport them (Agüero 2012; Núñez 1970).

The Tarapaca Ravine is an archaeological locality containing some of Chile's best known early sedentary settlements. One of these is the Caserones nuclear village, with more than 600 structures, among the largest villages of Formative origin in northern Chile. The site, which has a long history of human occupation (Fig. 2; Núñez 1982; True 1980; Urbina *et al.* 2012), is



**Figure 2.** Formative residential sites in Tarapaca Valley. (Modified from Núñez 1984, figs. 2&3; True 1980, fig. 2.)

situated alongside the Tarapacá Ravine, a waterway that flows down to water the Pampa de Tamarugal, an extremely arid desert plain that was covered in the past by a vast forest of *tamarugo*, *algarrobo* and *molle* trees (García *et al.* 2014). Satellite images show the remains of large-scale irrigation works and enormous farm fields that were in use during pre-Hispanic times. The village of Caserones, which flourished in the first six centuries AD, consists of rectangular-shaped enclosures of different sizes, residences and public spaces. Its origins can be traced back to around 1000 BC, and studies have confirmed the use of wooden posts to construct covered porches, and storage pits dug into the floor of dwellings with abundant remains of *algarrobo* pods, corn, beans, quinoa and cotton (Núñez 1982; True 1980).

Several hundred enclaves contemporaneous with the village have also been identified around the ancient forest at some distance from the farm fields (Núñez 1984; Urbina *et al.* 2012). Although many of these structures consist of stone assemblages for non-residential use and small stone walls for nocturnal protection, there is also a large number of individual and agglomerated residential enclosures. Among these, the site of Pircas 1, consisting of residential enclosures with walled patios, is the best known to date. Notable among the waste found at this site, which has been dated between AD 58 and 349, are small carved wooden sculptures, monochrome ceramics, basketry, woven textiles and yarn, abundant heavy stone artefacts for cutting and scraping, domestic camelid guano, corn, *algarrobo* pods, beans and

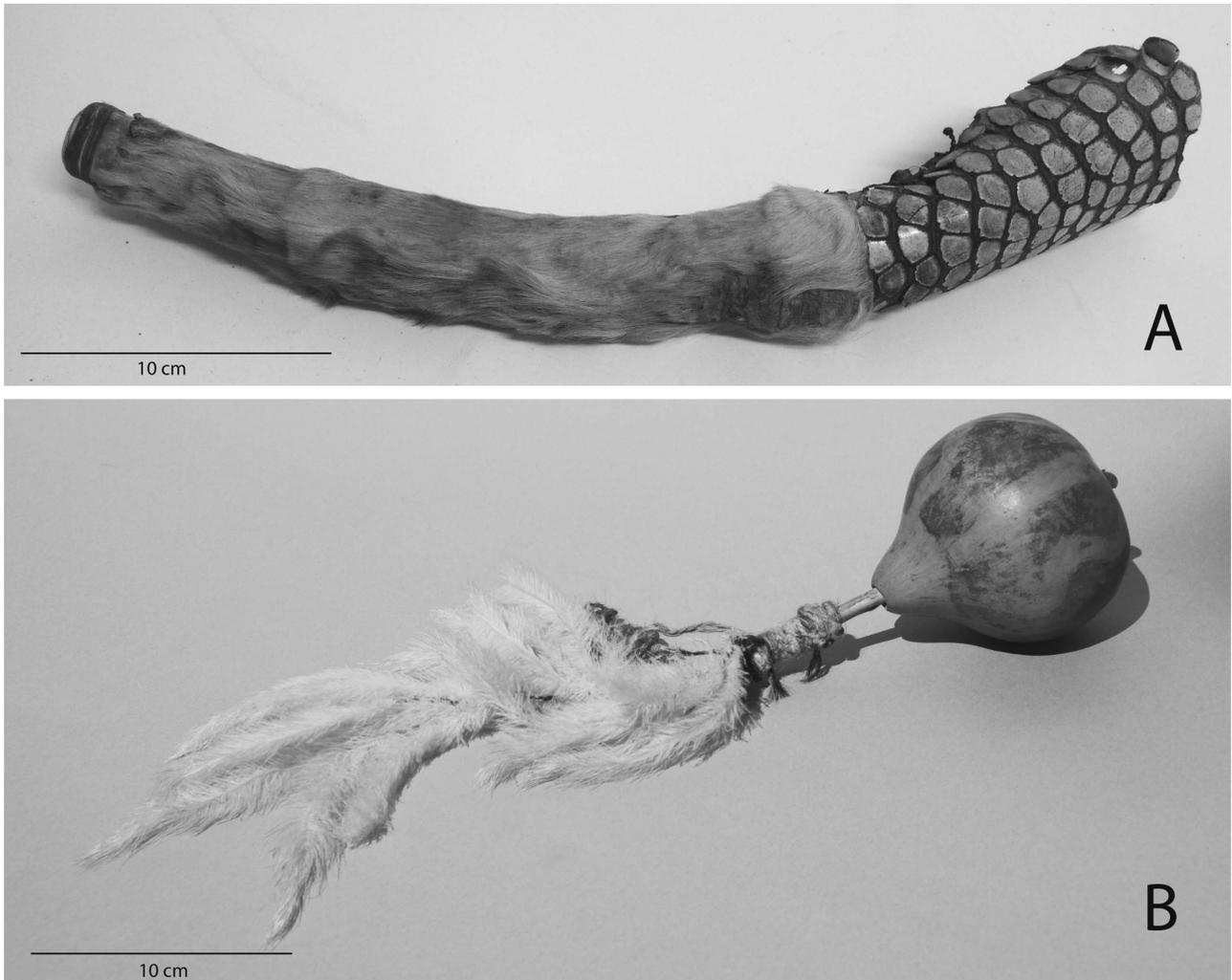
cotton (Núñez 1984). Similar items have been found at new excavations in nearby conglomerates, indicating that these places were in use from the third or fourth century BC onward (Méndez-Quirós 2012). This residential pattern of a nucleus combined with outlying areas is well known in the region and is also observed among the present-day indigenous population, who tend to use villages collectively during religious feasts but for much of the rest of the year live with their families (or parts thereof) on agricultural or herding homesteads two or more days away on foot. If the same pattern holds true for the period we are concerned with here, then the outlying camps would have been used for collecting *algarrobo* pods, horticulture and llama herding, while the village core would have been used as a storage and redistribution centre and for collective activities. This unique Formative settlement pattern, with hamlets surrounding a core village and spaces for collective use, suggests that celebratory feasts forged commitments from both domestic units and the community as a whole, probably around an annual cycle. From this we can conclude that authorities may have functioned only during those ceremonies, and were therefore a temporary rather than a permanent political phenomenon.

Clearly, this time in history was characterized by the surplus production of social wealth and economic and symbolic capital, a fact that is not only observable in its residential middens but also in the offerings and items of clothing deposited with the dead in cemeteries. This elaborate cultural material came from both local and non-local sources and was distributed relatively evenly. North of Caserones, on the opposite side of the ravine, is the Tarapacá 40 cemetery (Tr-40), which was used at least from the first millennium BC until the first few centuries AD (Núñez 1970; 1974; 1982). While the site contains abundant archaeological evidence of skilled craftwork, the most abundant items in all tombs are camelid fibre textiles and knitted artefacts, including turbans made of skeins of wool, blankets and tunics (Agüero 2012). There are also numerous miniature items of clothing made of what is believed to be vicuña hair, which points to the use of wild animal fibre, typical of the Formative Period in the Chilean desert (Agüero 2012; Cartajena *et al.* 2009). Other common finds from this cemetery are objects of non-local provenance such as harpoon heads, dried fish and octopus, seashells, vicuña and armadillo hides, tropical bird feathers, peanuts and *cebil* seeds (Núñez 1974; 1982). These exotic products were obtained through the movement and exchange activities of community members who possessed llama herds and specialized in taking them, laden with goods, on long-distance trading excursions

(Labarca & Gallardo 2012; Lazzari 1999; Nielsen 2013; Núñez & Dillehay 1995; Yacobaccio 2012). Knits and textiles were popular exchange goods that remained a sign of prestige even into Inca times (Agüero & Cases 2004; Murra 1975). Their early exchange function is supported by funerary contexts associated with marine hunter-gatherers of the desert coast, whose cemeteries are full of turbans, blankets and tunics made of camelid wool and cotton cords used as lines and ties (see Agüero 1995a; Mavrakis *et al.* 2003; Núñez 1971; Quevedo & Agüero 1994; Spahni 1967).

This settlement pattern and its associated mode of surplus production are foundational elements of all of the earliest sedentary enclaves of the Chilean desert oases (Agüero & Uribe 2011; Meighan 1980; Núñez *et al.* 2006; Pollard 1970; Rivera *et al.* 1995–6; Torres-Rouff, Pestle & Gallardo 2012), and were based primarily on the gathering and storage of the carbohydrate-rich fruit of the *algarrobo* tree, which based on current estimates can yield up to 480 kg of dried fruit per hectare (Dalmasso & Anconetani 1993; Llano *et al.* 2012). This product's central role in the human diet during this prehistoric period is consistent with analyses of mummy intestines, coprolites and stable isotopes (García *et al.* 2014; Holden 1991; Paredes & Aspillaga 1984; Pestle *et al.* in press; Rivera *et al.* 1980; Santana *et al.* 2012). But the evidence also suggests that crops such as *quinoa*, potatoes, beans and corn, the meat of wild camelids and rodents and dried saltwater fish obtained through trade also played an important role in the overall configuration of these groups' eating habits (García *et al.* 2014).

The production and storage of food, the farming of products for domestic use (gourds and cotton), the proliferation of skilled trades (metallurgy, ceramics, textile making, carpentry, basket making, building) and interzonal exchange increased community wealth; and the distribution of such products in residential sites and cemeteries suggests an environment dominated by redistribution and reciprocity. But perhaps the most indicative archaeological finding related to these practices is the presence of architecture designed for collective use in both village centres and productive residential units. Indeed, studies estimate that spaces intended for public use account for 30 per cent of all early architecture in the north of Chile (Adán *et al.* 2013). Excavations of such places have produced scant findings, indicating that they had been cleaned out in the past (Meighan 1980; Rivera *et al.* 1995–6). Still, in many sites with architecture intended for collective use (regardless of their size), we have been able to identify large mounds of waste nearby that contain abundant remains of ceramics, copper metallurgy, textiles, basketry, wood, stonework,



**Figure 3.** Formative musical instruments. (A) camelid bone and crocodile skin trumpet, Topater cemetery; (B) gourd rattle, Topater cemetery. (Photographs: FONDECYT Project 1110702.)

*algarrobo*, cactus needles, *cebil* seeds, *chañar*, corn, squash, fish bones, shells and wool (e.g. Agüero *et al.* 2006; Rivera *et al.* 1995–6). The abundance and diversity of the waste identified is consistent with large-scale consumption during collective celebrations, and such ceremonies have been confirmed independently by the appearance and proliferation of trumpets, drums, rattles and other musical instruments (Fig. 3; e.g. Focacci & Erices 1972–3; Grebe 1974; Pérez de Arce 1995).

It is therefore not difficult to conclude that, with their delayed return economy, these communities would have needed individuals to organize and then implement public works such as collective structures, irrigation canals, forestry management, harvesting and collective ceremonies (Núñez 1984). This social division of labour would undoubtedly have stimulated the emergence of social dis-

tinctions that were likely based on the unequal distribution of technical and ritual knowledge, rather than on material wealth. We know that information was being exchanged throughout the region, with ceramic, textile and rock-art styles shared and distributed over an extensive geographic range that extended at least from the Azapa Valley south to the Atacama Salt Flat and beyond (e.g. Agüero & Cases 2004; Cabello & Gallardo 2014; Gallardo *et al.* 2012; Uribe 2009; Uribe & Ayala 2004; Uribe & Vidal 2012). This group of localities with sedentary settlements appears to be interconnected by a trail network used intensively precisely during these times (Briones *et al.* 2005; Cartajena *et al.* 2009; Labarca & Gallardo 2012; Nielsen 2013; Núñez & Dillehay 1995; Pimentel 2009; Pimentel *et al.* 2011; Torres-Rouff, Pimentel & Ugarte 2012). Without a doubt, those who engaged in trading acquired not only goods but also significant

**Table 1.** Sites with cogged icons, according to the archaeological literature of northern Chile.

Region	Site	Function	ID	Cogged icon Ornament	Cogged Textile	Basketry	Metal	Rock art
Western valleys	Az-70	cemetery	1		•			
Tarapacá	Suca-7	rock art	2					○•
	Pisagua D	cemetery	3		○•			
	Ariquilda-1	rock art	4					○•
	Chusmisa	rock art	5					•
	Cerro Unita	rock art	6					•
	Tr-40	cemetery	7	▲	○•	○		
	Tamentica	rock art	8					•
	G-3	village	9	▲				
	G-1	village	10	▲				
	G-12	cemetery	11	▲				
	G-14	cemetery	12	▲				
	G-5A	cemetery	13				•	
Atacama desert	Alto Loa	rock art	14					•
	Rio Salado	rock art	15					•
	RAnL-273	cemetery	16	▲				
	Yalquincha	rock art	17					•
	Chorillos	cemetery	18	▲	•			
	Topater	cemetery	19		○•	○•		
	San Salvador	cemetery	20		○			
	Yerbas Buenas	rock art	21					•
	Vilama Sur	rock art	22					•
	San Lorenzo cave	rock art	23					○
	Tu-109	shelter	24	▲				
	Tu-54	village	25				•	

○Cogged as motif

●Cogged as ornament

information for cultural reproduction from oasis communities in the same latitudes, marine hunter-gatherers, highland herding folk and even the farming peoples of the Amazon jungles and northwest Argentina. These intercultural networks equipped these travellers with technical and ritual knowledge that would have engendered social distinctions and inequality when introduced into their respective communities.

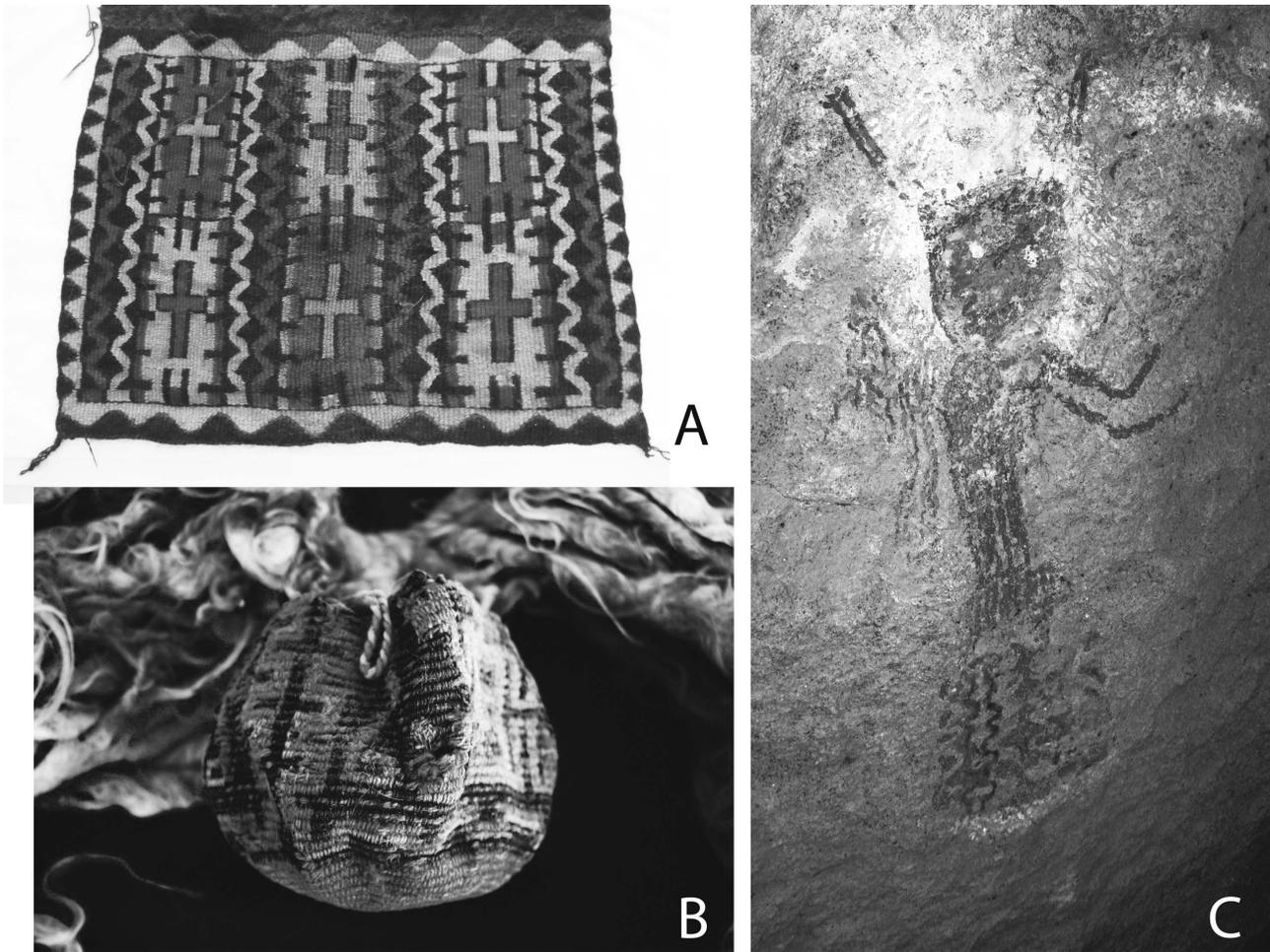
### Cogged designs in the visual imagery

In northern Chile, from the Western Valleys to the Atacama Salt Flat (some 600 nm from north to south), textiles, rock art, basketry and gold metalwork employed a rectangular-shaped cogged design as a structural resource for beliefs shared among different Formative populations (Table 1).

The rectangular geometric figure with cogged edges is common in this period in Northern Chile, where finds include several woven panels recovered

from the Topater and San Salvador cemeteries near Calama (Thomas *et al.* 1995; Torres-Rouff, Pestle & Gallardo 2012). The former site contains an abundance of textiles in which the cogged motif is replicated vertically and horizontally, forming a sort of band that is alternated with zigzag lines (Fig. 4A). This motif is also found in Tarapacá rock art (Ariquilda-1 and Suca-7) and textiles (Pisagua D and Tr-40: Fig. 4B) and on the attire of a figure painted inside San Lorenzo cave, east of the Atacama Salt Flat (Fig. 4C). It is also commonly represented in basketry recovered from Topater and Tr-40 (Núñez 1970).

But the cogged icon does not only manifest as a design motif; it also appears as a pendant hanging on the chests of anthropomorphic figures in a couple of woven pouches found in coastal and valley cemeteries north of Guatacondo (Pisagua D and Tr-40) and on a basket found at Topater. Most of these examples feature an anthropomorphic figure, commonly called the 'figure with two staffs', that is well known in the iconography of Northern Chile. This

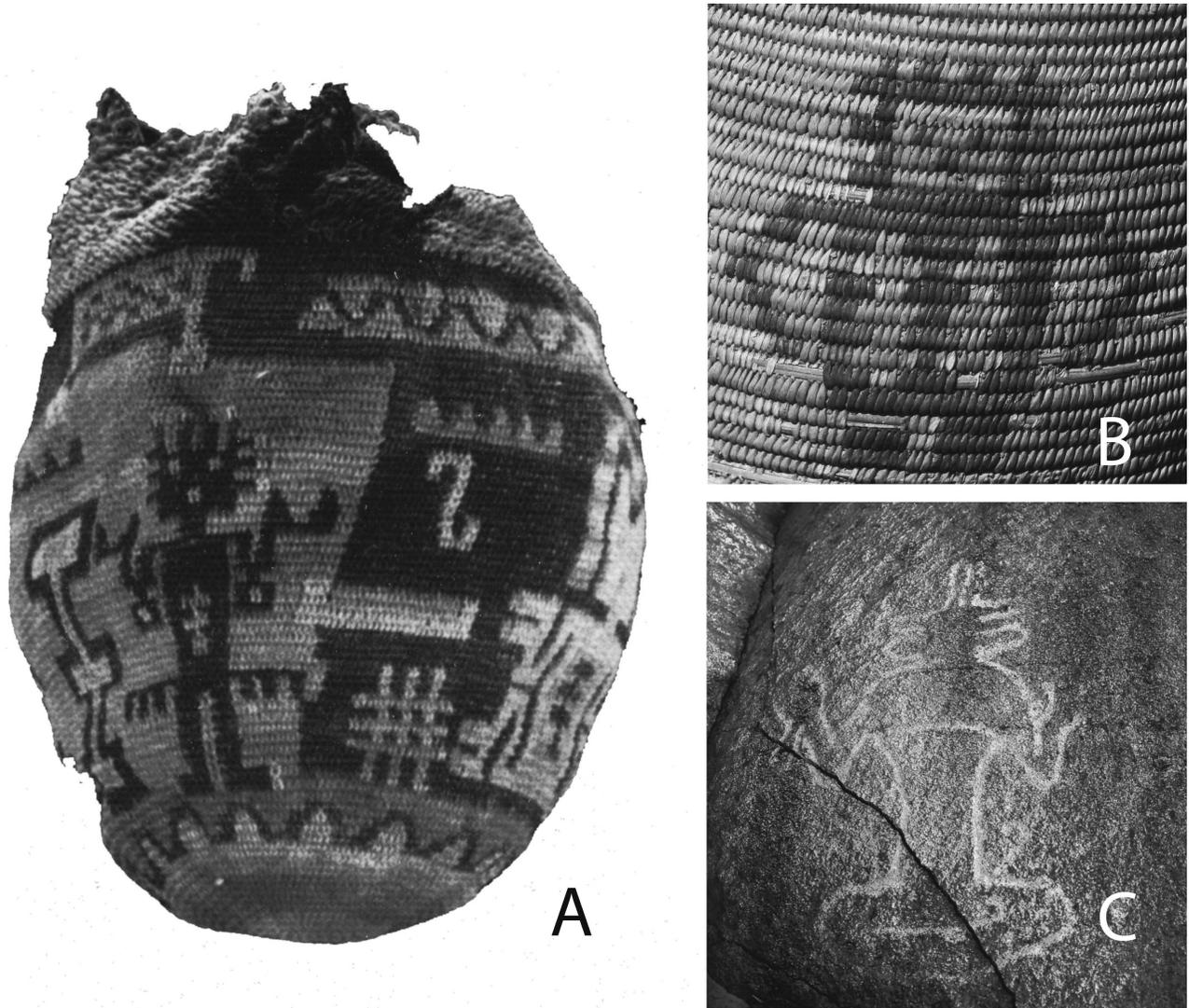


**Figure 4.** Cogged motif. (A) textile from Topater cemetery (Photograph: FONDECYT Project 1110702); (B) bag from the Tr-40 cemetery (Photograph: Pablo Méndez-Quirós); (C) rock-art painting in San Lorenzo cave, motif on skirt (Photograph: FONDECYT Project 1110702).

figure is usually represented standing upright, wearing a headdress and a short loincloth skirt, and holding an object in each hand (e.g. Berenguer 1981; Cabello & Gallardo 2014; Chacama & Espinosa 1997; Focacci & Erices 1972–3; Montt 2002; Mostny & Niemeyer 1983; Núñez *et al.* 2006; Vilches & Cabello 2011). During the following Middle period (AD 400–700), this icon would once again become popular in association with Tiwanaku motifs (Torres 1987).

In northern Chile, this Formative anthropomorphic image is extremely popular in engravings (Ariquilda-1, Suca-7, Tamentica, Chusmisa, Yerbas Buenas, Vilama Sur, Río Salado) and in rock-art paintings (Alto Loa Region, Yalquincha) and geoglyphs (Cerro Unita), and is also occasionally found in textiles (Az-70 and Chorrillos) and on objects made of gold laminate (G-5A and Tu-54) that have been discovered throughout the area considered here (Fig. 5).

Until now, however, no notice has been taken of the attribute that varies least among all figures of this kind: the headdress features none other than a cogged design with the same geometric pattern described above (Figs. 5A & 5B). It appears unmistakably, crowning the head of this figure from the collective imagery in a clear reference to the bone ornament with cogged edges used with the turbans (Meighan 1980). While this icon was designed in a visually economic way, the same cannot be said of certain ancient Formative rock-art figures that characterize one of the engraving styles of the Atacama Desert (Berenguer 1995; Gallardo 2001; 2009; Gallardo & De Souza 2008). Unlike the images of Tarapacá, in these the form of the cogged artefact is much more similar to that of the bone ornament, and the figure itself displays a different posture, always appearing seated and holding what appears to be a gourd rattle, a common musical



**Figure 5.** Cogged ornament designs in human figures. (A) bag from the Pisagua D cemetery (Photograph: Indira Montt); (B) basket from Topater cemetery (Photograph: FONDECYT Project 1110702); (C) rock-art engraving from Río Salado (Photograph: FONDECYT Project 1110702).

instrument during the Formative period of northern Chile (Fig. 5C; Focacci & Erices 1972–3; Pérez de Arce 1982; Thomas *et al.* 1995). This iconographic variability suggests that the common imaginary resulting from social interactions was itself subject to local configurations that depended on the traditions of each group in relation to their beliefs in the supernatural world.

Chronologically, the cogged ornament appears around the beginning of the ancient Formative period and remains until the Late Formative (AD 100–400) (Table 2). While the sites dated earlier and active for the longest time correspond to those in Tarapacá Region, the Western Valleys and the Atacama Desert display dates later than 900 BC. This suggests that the cogged artefact may have originated in Tarapacá,

which is consistent with the relative abundance of the icon found on rock supports, textiles and basketry.

#### Bone artefact with cogged edges

Few Formative ornaments have such extensive spatial distribution as those made of bone and having cogged edges. Examples of these have been found at different archaeological sites in Tarapacá Region and the Atacama Desert, mostly in tombs in cemeteries that have never been the subject of published monographs, but we know they correspond mainly to individual burials in simple graves, very often marked with a thick trunk of wood and having little contextual difference among them (Meighan 1980; Núñez 1970; 1974;

**Table 2.** Cogged icon and sites with radiocarbon dating.

Region	Site	Location	2 sigma calibration		Lab. Code	Reference
Western Valleys	AZ-70	n/r	787 BC	350 BC	GAK-5818*	Núñez 1976
Tarapacá	Tr-40 A	Grave 62, section M	AD 127	AD 831	GAK-2893*	Núñez 1976
	Tr-40 A	Grave 29, section M	AD 248	AD 631	GAK-2206*	Núñez 1976
	Tr-40 A	Grave 4	60 BC	AD 231	CAMS-10323*	Oakland 2000
	Tr-40 A	Grave 90, section M	1050 BC	801 BC	CAMS-10324*	Oakland 2000
	G-12	Grave 2	1050 BC	811 BC	UCLA 1698A*	Tartaglia 1980
Atacama Desert	RAnL 273	273A-1	378 BC	AD 73	I-5.400*	Pollard 1971
	Chorrillos	Grave 3, unit C14 SW	820 BC	770 BC	Beta-205812	González & Westfall 2010
	Chorrillos	Grave 1, unit C18 NE	400 BC	200 BC	Beta-206816	González & Westfall 2010
	Chorrillos	Grave 2, unit D11 SW	820 BC	770 BC	Beta-206817	González & Westfall 2010
	Chorrillos	Grave 4, unit F16 SE	800 BC	740 BC	Beta-205814	González & Westfall 2010
			710 BC	530 BC		
	Chorrillos	Grave 1, unit F18 NE	810 BC	760 BC	Beta-206818	González & Westfall 2010
			680 BC	550 BC		
	Chorrillos	Grave 1, unit H16 NE	850 BC	790 BC	Beta-205813	González & Westfall 2010
	Chorrillos	Grave 2, unit P12 SW	390 BC	190 BC	Beta-204964	González & Westfall 2010
	Chorrillos	Grave 3, unit P13 SE	750 BC	700 BC	Beta-206819	González & Westfall 2010
			540 BC	390 BC		
	Chorrillos	Grave 1, unit O11 SW	800 BC	520 BC	Beta-204963	González & Westfall 2010
	Topater	Unit N3	410 BC	360 BC	Beta-259693	Labarca & Gallardo 2012
	Topater	Unit I8	360 BC	270 BC	Beta-322289	Labarca & Gallardo 2012
			260 BC	170 BC		
	San Salvador	Grave 1	200 BC	AD 10	Beta-247417	Gallardo n/r
	Tu-109	C. 2 <sup>a</sup> /offering	780 BC	380 BC	Beta-200614	Núñez <i>et al.</i> 2006
	Tu-54	Estructure F/cF4-5	810 BC	390 BC	Beta-44413	Núñez <i>et al.</i> 2006
	Tu-54	Estructure F/c.F4	900 BC	770 BC	Beta-198844	Núñez <i>et al.</i> 2006

\*Our calibration following Calib Rev 5.0.1. (SHCal04).

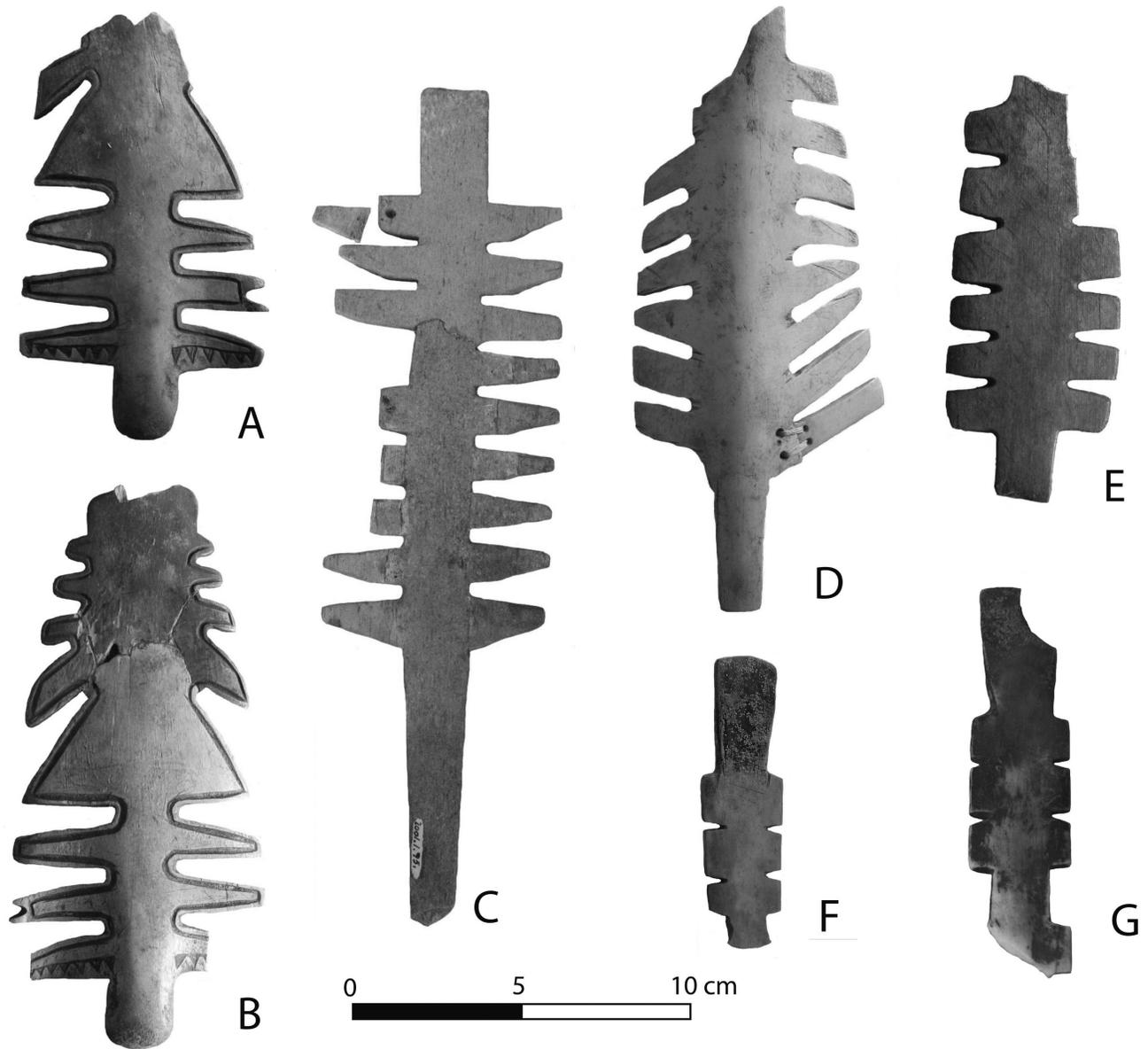
Pollard 1970; Thomas *et al.* 2002). It is therefore difficult to know the sex and age of those who used them, but the limited reports we do have suggest that they were associated with adults, similar to the situation at the Chorrillos cemetery in the oasis of Calama (Martínez & Novoa 2005).

Although no zooarchaeological analyses are available, experts often suggest that these are made of what appears to be marine mammal bone. These artefacts are roughly rectangular in shape in the upper half, with serrated or rectangular cogged edges and a longer, narrower lower segment that in most cases ends in a straight base (Meighan 1980; Núñez *et al.* 2007). Although the cogs are always arranged along a vertical axis, their number and shape display variations that allow the pieces to be divided into different groups. Judging by the few complete pieces, they ranged in size from 25 to just over 30 cm in length (Fig. 6).

Eight of the 17 known ornaments of this kind come from the Guatacondo ravine, situated in the

southernmost extreme of Tarapacá Region. The area is now a desert, and although its only watercourse is seasonal, underground springs enable a small oasis to exist here. From the Altiplano, the river runs through a narrow ravine that ends when it reaches the desert plain. There, several archaeological sites have been discovered, including villages, hamlets, cemeteries, extensive cultivated fields with irrigation canals, lithic workshops and rock art (Mostny 1970).

The formative nuclear village (G-1) has more than a hundred circular residential enclosures equipped with numerous storage pits dug into the floor of the dwellings, the number of which affects the size of the structures (Meighan 1980). These clustered enclosures were organized around an enormous *plaza* or open space, about 2000 sq. m in area, with a stone monolith at the centre and evidence of an overhanging roof attached to the perimeter walls that could have sheltered a significant number of people (Meighan 1980; True 1980; Urbina *et al.* 2012). This investment in the architecture contrasts with the lack of material



**Figure 6.** Coggled ornament. (A–E) from sites in Guatacondo ravine (Photographs: Danisa Catalán, FONDECYT Project 1130279); (F) Chorrillos cemetery in Calama, fragment (Photograph: FONDECYT Project 1110702); (G) Tarapacá 40 cemetery in Tarapacá ravine, fragment (Photograph: Danisa Catalán, FONDECYT Project 1130279).

recovered from excavation of the enclosures themselves, which included crushing elements and the remains of a large ceramic vessel to store and transport liquids, which suggest that the site was used for collective ceremonies and festivities (True 1980; Uribe & Vidal 2012).

A fragment of a coggled ornament was recovered from the floor of one of the rooms in this village, and another seven were found in the nearby cemeteries. Four of these coggled ornaments were found in two of the 33 tombs that were excavated near the village (G-

12/14), some of them stuck into thick skeins of wool that had been used as turbans (Meighan 1980). Another three pieces came from tombs in a small hamlet not far from the ceremonial centre (G-3). All of these items display evidence of use at their edges, and many of them show signs of repair, consistent with use as turban adornments (Catalán 2012).

This kind of artefact is not exclusive to formative sites of Guatacondo; one was also recorded in Tr-40 cemetery (Catalán 2010; 2012; Núñez & Santoro 2011). All other extant coggled ornaments were found

in the Atacama Desert region, most of them recovered from a few tombs in the Formative cemetery RANL-273 in the locality of Chiu Chiu (Pollard 1970; Thomas *et al.* 2002). That site is located in the desert alongside the Loa River, which flows down to the Pacific Ocean and is the sole watercourse in this desert zone. The excavation of a grave in the 1970s yielded at least four adult individuals in different degrees of disarticulation, along with an array of material remains, including two cogged ornaments (Pollard 1970). An adjacent tomb was later examined and found to contain the remains of 20 incomplete adult individuals and two infants; as in the previous tomb, three ornaments made of polished bone with cogged edges were recovered that had evidently been repaired (Benavente *et al.* 1998; Salazar 1997). These small funerary vaults displayed evidence of intense looting, but the material that was recovered included the remains of skeins of yarn that had been used as turbans. Not far from Chiu Chiu is the locality of Calama, another oasis watered by the Loa River. The Chorrillos cemetery was discovered here, containing more than 300 individuals in a poor state of conservation owing to agricultural activities in the area. The few grave goods and offerings recovered include the turbans of four male individuals, and from one of these cactus needles and a fragment of a cogged ornament were found as well (González & Westfall 2010).

The final ornaments of this kind were discovered on the southernmost border of the Atacama Salt Flat in Tulan ravine, at Tu-54, a large early Formative residential and ceremonial village (Núñez *et al.* 2006). Here, in a small rock shelter (Tu-109), an offering was found buried in the ground below a rock-art panel (camelids in the *Taira-Tulan* style: see Gallardo 2009); it consisted of a plant fibre packet, inside of which was a section of a compound dart, four bone throwers, three wooden combs and two of the cogged artefacts displaying evidence of red, blue and yellow surface pigment and of repairs along the central segment (Núñez *et al.* 2006; 2007). It is likely that this unique deposit is a ritual reference to the artefacts of privilege held by figures depicted in Atacama Desert rock art (Montt 2004).

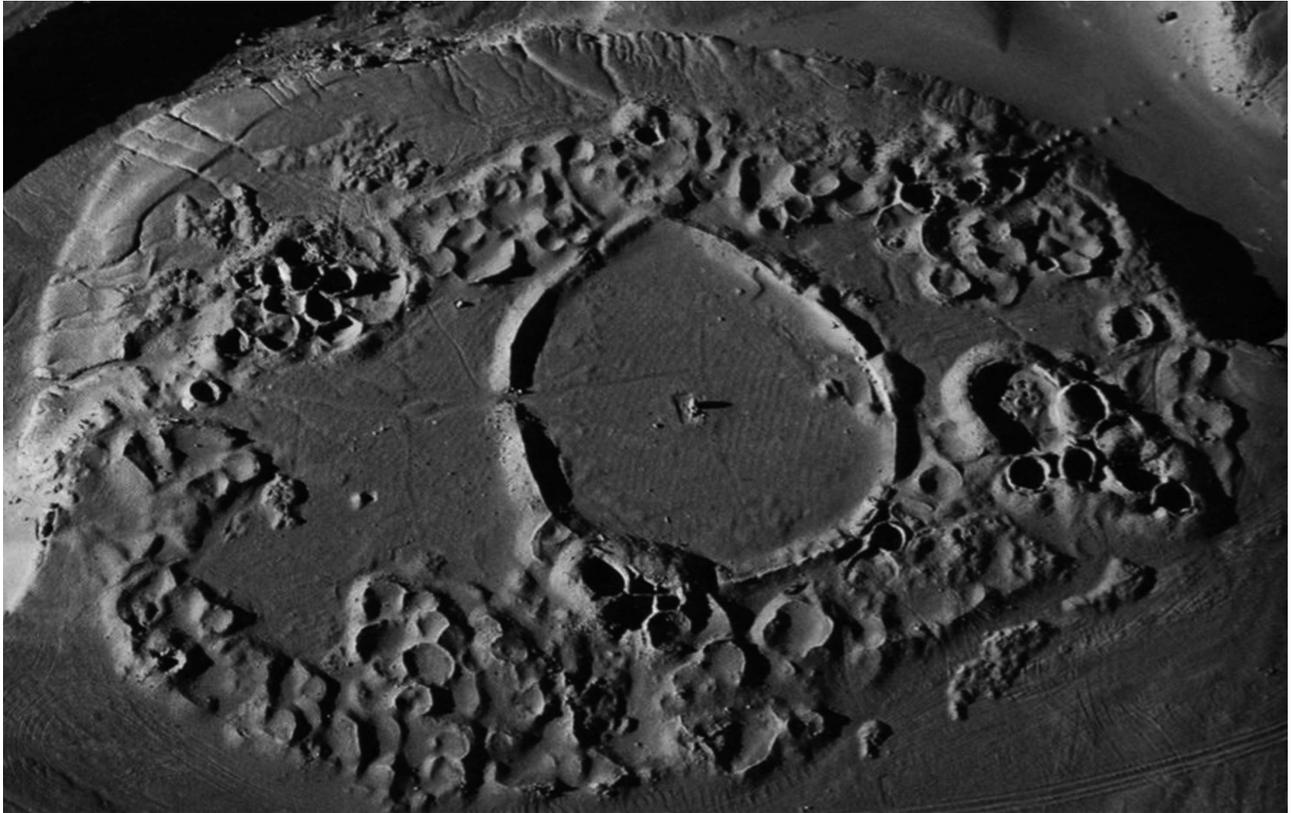
Brief mention must be made here of the raw material of marine origin that was apparently used to make these ornaments. While it is not curious that an object of such political and symbolic importance was made from an extra-local resource, it is particularly relevant, as this type of object is not found among the known inventory of marine hunter-gatherers of the time. As one of several materials inserted into the turbans the substance is significant, as it suggests that the wearer's definition of self was embedded in a cultural landscape that spanned different ecozones. The

Pacific coast was likely the most frequent destination of those who trafficked goods in the region, and its products were certainly part of the diet and imagery of the oasis peoples (Cabello & Gallardo 2014).

### Social context of the cogged icon

The first villages in Chile's northern desert oases were established during the Ancient Formative period (Adán & Urbina 2007; Benavente 1982; Llagostera *et al.* 1984; Meighan 1980; Núñez 1982; Núñez *et al.* 2006; Orellana 1988–9; Sinclair 2004; Uribe 2009; Uribe & Vidal 2012). These were inhabited by gathering and agricultural communities that raised herds of animals primarily as beasts of burden to move goods inter-regionally. During these times, villages display the constant presence of clusters of residential enclosures arranged around a plaza free of buildings, which has been interpreted as a space for holding social gatherings during community festivities (Fig. 7; Adán *et al.* 2013; Núñez *et al.* 2006). Also belonging to this period are the first clustered burial grounds, a funerary practice that is consistent with the appearance of corporate collectives.

There is little doubt that, among privileged garments, turbans made of thick skeins of wool played a significant role in communicating political and religious values on an interregional scale in the north of Chile (Agüero 1993; 1994; 1995b; Gallardo 1993; Núñez 1970). Their high visibility enabled others to identify the status and prestige of the individual wearing them—people who generally wore turbans of fine yarn and displayed in their skeins a variety of artefacts whose value resided in their raw materials, craftsmanship and symbolic functions (Agüero 1995b; Núñez 1974). The combinations of these artefacts in funerary contexts are so varied that, although the headdresses (which also varied in shape and size) seemed to have a common arrangement, the ornaments that adorned them appear to refer to the personal and social attributes of the individual subject. This differentiation constantly incorporated goods from outside the area, often including implements for consuming hallucinogenic substances (*Anadenanthera colubrina*) from the jungles of northwest Argentina; necklaces made of seeds from Eastern Bolivia; seashell beads; harpoon heads and fishing weights made by hunter-gatherers on the Pacific coast; objects that incorporated exotic feathers and woods; and some of the earliest copper metal objects (Fig. 8). Based on these associations, it can be concluded that the display of individual differences in mortuary arrangements was closely linked to social interactions that occurred among different groups and in different ecozones, primarily



**Figure 7.** Village of Guatacondo (G-1, c. 1970). (Photograph: FONDECYT Project 1130279.)



**Figure 8.** Turban of wool skeins, natural colour and dyed, with a necklace of seeds from Eastern Bolivia, a fishing weight from the Pacific Ocean, a bone awl and a woven belt. (Collection of the Museo Chileno de Arte Precolombino.)

signalling individual differences rather than broad social distinctions.

Among turban adornments having an exclusively visual design, clearly the cogged bone ornament can be seen as distinctive—indeed, its limited appearance in burial contexts shows that it was worn by only a few individuals. Despite its distinctiveness, however, the ornament's extensive distribution among different archaeological sites in the Chilean desert suggests that it played a symbolic role in articulating different local communities as well as in the Formative imagery. This interpretation becomes even more noteworthy when we consider that the same iconography is present in textiles, basketry and rock art. The spatial recurrence and visual redundancy of the design also shows conclusively that it played an important role in unifying related beliefs at the inter-regional scale, and its adoption can only be attributed to very frequent movement and exchanges among communities. Local variations of this same image also suggest the circulation of ideas rather than artefacts produced in a centralized location, which is a mode consistent with non-state societies.

The many different shapes and materials employed to create the cogged design indicate that it was a visual field that operated symbolically, arranged and negotiated according to the context to produce different visual discourses that nonetheless were organized around the same icon; it was a design initiative that, regardless of its meaning, reveals the high value of the signifier. And that value becomes even more relevant when we consider that the icon was present simultaneously as a headdress ornament, body ornament and headdress itself in figures of the visual imagery that unquestionably belonged to the supernatural world. The visual linkage established between imagery beings and individuals who wore this rectangular object with cogged edges provides a rationale for arguing that some individuals enjoyed a privileged social position. According to early colonial documents, the link between the mythical world and emblems was the way in which certain objects acquired value as insignias of authority, which were indispensable in the task of governing (Cummins 1998; Martínez 1988). One such emblem was the *mascaipacha*, which, according to an early seventeenth-century dictionary, was a red fringe that hung over a ruler's forehead (Gonzalez Holguin 1608, 228). The relationships between artefacts, iconography and leadership have a long history, and were also documented for the Moche and the early Nasca in northern and southern Peru (Alva & Donnan 1993; Silverman & Proulx 2002). These leaders possessed knowledge that enabled them to mediate relations between the powerful divinities and the

everyday world. Among the modern-day indigenous communities of northern Chile, this task is officiated by the *yatiri*, 'he who knows the customs', a figure who leads the ceremonies that bring together the entire community (Castro 1988; Gallardo *et al.* 1999).

If these archaeological associations and ethnographic analogies are correct, then those who could display this emblematic object would have held a position of political and/or religious leadership in their communities, a privileged status that generally appears in relation to differential access to knowledge, especially knowledge that is necessary for a community's symbolic and social reproduction. If that knowledge was considered a form of wealth and was unevenly distributed, then there must have been some restrictions to acquiring it. From an archaeological perspective, the extensive geographic distribution of the icon analysed here points to one of these restrictions—that only some members of the community would have participated in caravan journeys. If we consider that neither the funerary nor residential contexts mentioned displayed excessive accumulation or material differences—including goods obtained by exchange, which appear only in moderate quantities in most of the graves—then we may affirm that the role of those who had access to foreign objects was primarily redistributive.

## Conclusion

In the prehistoric past, certain economic and social conditions fostered opportunities for the emergence of complexity, an early scenario of social inequality that necessarily involved the exercise of authority by leaders whose actions were linked to the reproduction of the community—the social aggregate beyond the domestic unit. Certainly, the identification of such figures in archaeological contexts is of great interest, for until we can identify precisely the sources and types of wealth that led to such inequality, we can hardly inquire as to its origins. This is the task of contextual archaeology, and it must be pursued through information gleaned from multiple lines of evidence.

As we know, sedentary life in the Chilean desert oases began around the first millennium BC. These early village populations enjoyed the benefits of intensified food and craft production. Their cultivation of quinoa, beans and corn and gathering of *algarrobo* and *chañar* fruit provided food and alcoholic beverages. The hunting of wild animals provided meat, leather and fibres for making fine yarn and textiles. Copper mining enabled metallurgy and the production of beads for exchange. The raising of llama herds as cargo animals encouraged the interregional flow

of goods and information and the circulation of exotic products that integrated ecozones as divergent as the Pacific coast, the desert oases, the Altiplano and the warmer climes of eastern Bolivia, as well as the jungles of northwest Argentina. All of these social practices served a communal mode of production that was characterized by the broad and diverse division of social work. Given the range of social roles in a delayed return system, this economic and symbolic heterogeneity would have had to be organized, and this in turn would provide fertile ground for the emergence of leaders capable of moving the products of community-wide efforts in redistributive ceremonies that upheld traditional forms of reciprocity. The prestige and legitimacy of these early authorities was based in part on their links with the supernatural world and their esoteric knowledge, which they expressed materially in their use of insignia or emblems that invoked the deities of the visual imagery. The ritual knowledge of these leaders was clearly related to mobility and regional exchange, as the long-distance journeys they embarked on gave them access to privileged information and exotic goods that would have made a substantial contribution to ceremonial feasts.

Hayden (1998) has described these early leaders as ambitious, aggressive, and acquisitive individuals capable of mobilizing others to promote their own interests. It is difficult to disagree with this estimation, given the overwhelming ethnographic and ethnohistorical information available to support it. However, as the archaeology of northern Chile includes little evidence of the accumulation of material wealth or hierarchical display through domestic architecture, but rather reflects an environment in which wealth was redistributed, it is reasonable to conclude that these ancient inequalities could have been governed more by altruism than by personal ambition. This political-economic conclusion is paradoxical, as, at its origin, complexity may have had the purpose of preserving the sharing that governed relations of social equality.

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