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Rock art of the upper Lluta valley, northernmost of Chile (South Central Andes): A visual approach to socio-economic changes between Archaic and Formative periods (6,000–1,500 years BP)

Carole Dudognon ^{a,*}, Marcela Sepúlveda ^b^a Université Toulouse Jean Jaurès, UMR 5608, Laboratoire TRACES, CReAP, France^b Universidad de Tarapacá, Instituto de Alta Investigación, Laboratorio de Análisis e Investigaciones Arqueométricas – Laboratorio de Arqueología y Paleoambiente, Arica, Chile

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ABSTRACT

Though they are generally characterized on the basis of faunal remains or lithic industries, in the highlands of northernmost Chile, the cultural aspects of the socio-economic changes, between Archaic and Formative periods (6000–1500 years BP), from hunter-gatherer to pastoral modes of life, a consequence of the domestication of camelids, can be discussed through the numerous scenes painted on the stone surfaces of rock shelters. The originality of these representations lies in the precision with which certain practices are represented, and in the socio-economic and symbolic relationships that between humans and animals, specifically with the camelids of the Andes. The present study is based on the analysis of these scenes, with the human-animal relationship, and the graphic superpositions, at six rock-art sites in the upper Lluta valley in *precordillera* or andean foothill, of the northernmost of Chile. We observe that the technical investment and the objective of the scenes become increasingly complex and focused on the control and possible protection of the animal. In the absence of archaeological contexts related to domestication in this region of the South Central Andes, this new study provides an innovative approach to the progressive changes of practices related to animal management, several hundreds of miles from the area where *in situ* domestication is evidenced.

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1. Introduction

In the Atacama Desert in the northernmost of Chile, at an altitude of more than 2800 m, first human presence is only known through a few archaeological sites that indicate sporadic occupation from the Early Archaic period, around 10,500 years BP (Aldenderfer, 1999; Osorio et al., 2011), with few signs of substantial change until Formative period or andean Neolithic, around 1500 years BP (Sepúlveda et al., 2013; Osorio et al., 2016). As no residential structures are known for these periods, the painted rock art of the region known at a few hundred sites represents one of the significant sources for understanding the occupation of the area and socio-cultural context of the related populations. Exposed on the walls of rock shelters and ravines, the panels are composed of

different scenes depicting increasingly complex relationships with camelids, the principal animal represented.

These paintings, charged with a symbolic function, present an opportunity to approach the socio-economic contexts of the hunter-gatherers populations of the highlands over the course of a profound and progressive change in their relationship with camelids (Izeta, 2008). The domestication and subsequent management of these animals during the Archaic Period is considered one of the major developments in andean societies, constituting a fundamental element of the economy, ideology, and daily life in general. Camelids present an important dietary resource, but also provide a range of secondary products (hides, wool, fat, bones) and are used as beasts of burden (Bonavia, 1996; Mengoni Goñalons, 2008).

The pictorial practice in the upper Lluta valley in the *Precordillera*, between 2,800 and 3,800 masl, presents a certain thematic and stylistic coherence with a vaster region, and the term “*tradición andina*” (Guffroy, 1999) or “Naturalist Tradition” in southern Peru, other regions from northern Chile, and western Argentina captures

* Corresponding author.

E-mail address: carole.dudognon@dbmail.com (C. Dudognon).

this concept in large part. Even if research has identified several shared stylistic elements, the chronology of the representations remains varied. Numerous excavation programs have allowed for works of rock art to be situated in a long tradition that extends from the Archaic period (10,500 years BP) to the Formative around 1500 years BP (Santoro and Chacama, 1982; Muelle and Ravines, 1986; Klarch and Aldenderfer, 2001; Gallardo, 2001; Aschero, 2006; Nuñez et al., 2006; Gallardo and Yacobaccio, 2007; Yacobaccio et al., 2008; Sepúlveda et al., 2010, 2013).

Changes from the Archaic to the Formative periods are characterized in the South Central Andes by a suite of socio-economic innovations that took place between almost 6000 and 3,700 years BP. Among them, are: sedentism (Nuñez, 1976; 1982; Aldenderfer, 1990; Lavallée, 2006), increased social complexity (Aldenderfer, 1990, 1998; Nuñez et al., 2006; Kaulicke, 2007; Uribe, 2008), the consolidation and domestication of animals and plants (Lavallée and Julien, 1980; Lavallée and Lumbrales, 1985; Wheeler, 1999; Yacobaccio, 2003; Cartajena et al., 2005, 2007; Gallardo and Yacobaccio, 2005), in addition to the development of novel technologies in ceramic, metal, cotton and wool cloth, and innovations in water management related to agricultural practices (Lumbrales, 2006). The research conducted over the past decade attributes the rock art of the Naturalist Tradition from northernmost of Chile to the end of the Middle Archaic, around 6000 BP. This practice became more and more pronounced between 6000 and 4000 BP (Late Archaic) and continued with some stylistic variations into the Formative period (Sepúlveda, 2011; Sepúlveda et al., 2013).

The rock art of the Naturalist Tradition is almost exclusively based on the depiction of animals, with camelids playing a central role. Depicted in a “naturalist” style, camelids were at first absent from depictions of human activities and entered into them to eventually become the principal figures. An in-depth study of the representations painted at six rock shelters at Vilacaurani, Incani, and Anocariri in the highlands of far northern Chile offers interesting data based on the interpretation of scenes that could be chronologically sequenced in a study of superpositions of paintings that anchors the representational practices in the socio-economic practices of a relative chronology that would have unfolded between the Late Archaic and Formative periods.

2. Regional settings

A few environmental and archaeological “landmarks” indicate the coherence of these six study sites. In a limited geographic expanse subject to extreme but rich environmental conditions, large mammals (camelids, cervids and carnivores) gravitate toward the boundary-zone with several ecological zones that shift with altitude. In this region, the rugged relief of the *Precordillera* presents numerous advantageous areas close to flowing water that support various species of plants and animals characteristic of highlands (Villagrán et al., 2003; García and Sepúlveda, 2011). Situated at altitudes between 3200 and 3800 masl, Vilacaurani, Incani I, II, and III, and Anocariri, at the upper Lluta valley, climb along a narrow geological band called the *Precordillera*, where the relief is marked by large rivers that flow east and west, toward the Pacific Ocean and the Desert, respectively (Fig. 1). The *Precordillera* ecologically correspond to the *pre-puna* (2,600–3,200 masl) and *puna* (3200–4000 masl), at the boundary between two major ecosystems: the pampa of the desert, and the *altiplano* (high plains). Dominated by shrubby plants, the *pre-puna* and *puna* biotopes are home to numerous mammals, including guanaco, the taruca (a small Andean cervid), and the puma, all endemic species, as well as numerous birds and rodents. The ecological richness of these places is often invoked as an explanation for human settlement because the rich biomass presents an ideal environment for hunting, as well

as for herding and pastoralism because the annual climatic variations normally provide year-round forage and present a great stability in time (García and Sepúlveda, 2011). These activities are largely represented on the walls of the rock art sites (Niemeyer, 1972; Santoro and Dauelsberg, 1985; Sepúlveda, 2011; Sepúlveda et al., 2010, 2013; Dudognon and Sepúlveda, 2013, 2015). The artists drew inspiration from the surrounding environment in its totality in the creation of their works, but representations of interactions with camelids are the most numerous.

3. Material and methods

3.1. Painted rock-art sites

The shelters of Vilacaurani and Incani I, II, and III were described in the 1970s by H. Niemeyer (1972), while Anocariri I and II were not discovered until the 1980s (Santoro and Dauelsberg, 1985). The first excavations undertaken at the foot of the walls of several painted rock-art sites in the *Precordillera* allowed Niemeyer to assign a cultural context to the paintings. He considered attribution of all rock art painting to the pre-Inca epoch, almost 750 and 500 BP to be the most viable hypothesis, though specialists working in neighboring countries already considered the art form to be much older (Cardich, 1964; Ravines, 1967; Muelle, 1970). Niemeyer's work centered primarily on the artistic study of the paintings, led him to emphasize the stylistic coherence between sites that opposed naturalistic camelids with more schematic human figures (Niemeyer, 1972). The term “naturalist” is employed in reference to the detail and precision displayed by the animal figures, of which certain features like the rump, the hooves, and the lower line of the belly are accentuated to emphasize the wild and “natural” character of the animals. Niemeyer places this artistic treatment in opposition to that of human figures, summarizing the latter as “stick-figures” (Mostny and Niemeyer, 1983), in the creation of a symbolic universe by idealized camelids and by human figures that have been simplified to an extreme.

In the 1980s, Santoro and Chacama (1982) provided a different archaeological context for these paintings with the discovery at the site of Patapatane of a painted part of panel in a stratified layer dated to 4000 years BP. The excavations of Piñuta attest to the presence of pigments between strata of the Late Archaic (3800 years BP) and the Formative, around 2500 BP (Santoro et Dauelsberg, 1985; Santoro, 1989). This work also led to the discovery of the site of Anocariri, which was not excavated but bears rock art attributed to the context of a pastoral society. One scene, without a precise chronological attribution, is interpreted as an enclosure where camelids attached at the neck may be part of a corral by herders (Santoro and Dauelsberg, 1985: 81). The chronological association of pastoralism with the Formative period was called into question by the sites of Itiza and Mullipungo, in the high Tignamar basin, in the upper Azapa valley, southern from Lluta Valley, by Schiappacasse and Niemeyer (1996). These data are confirmed by recent research in the same basin by Sepúlveda and collaborators, which identified an occupation of painted rock art sites at the end of the Middle Archaic (6000–4000 years BP) and Formative Period (3700–1500 years BP) (Sepúlveda, 2011; Sepúlveda et al., 2013) although no direct link between the panels and the archaeological levels has been shown, and there is no direct dating.

The reassessment of these artistic expressions, particularly from the Naturalistic Tradition, with the advent of recent methodological advances, has given new life to their study (Cerrillo Cuenca and Sepúlveda, 2015; Dudognon and Sepúlveda, 2015). For these traditions, a certain “naturalist” homogeneity stands out in the treatment of animal figures, but recent research emphasizes the variety in the representation of the human form (Sepúlveda, 2011;

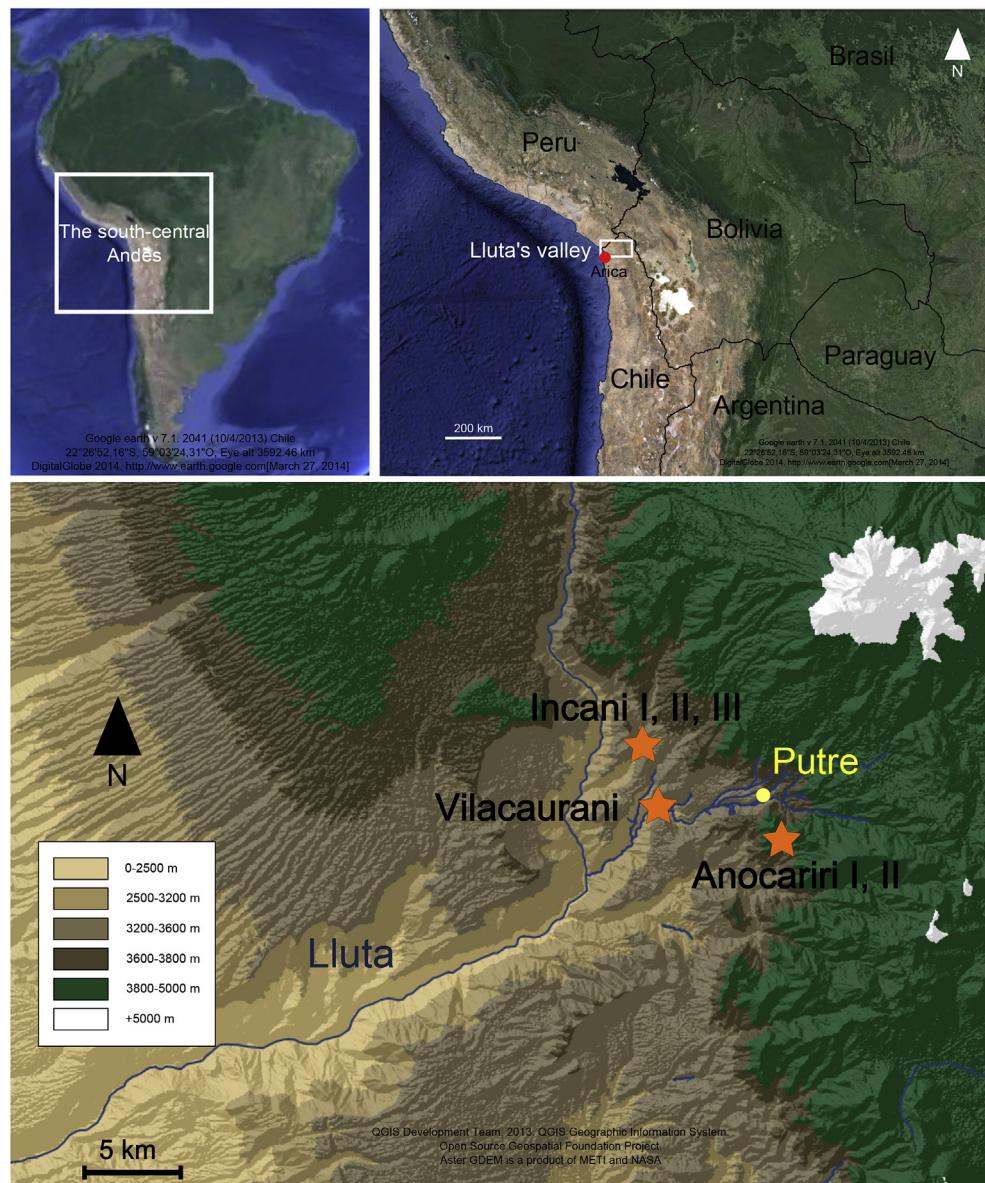


Fig. 1. Map of the study area showing the location of the three study-sites in the Lluta Valley in the southern zone of the Central Andes.

(Dudognon and Sepúlveda, 2015). The variability in the representation of relation between camelids and anthropomorphs, as well as variation in the proportions of motifs and the diversity of scenes has allowed for the definition of different stylistic groups within the Naturalist Tradition (Sepúlveda, 2011; Sepúlveda et al., 2013). However, Incani and Vilacaurani present particular graphic superpositions that present the opportunity to situate the different scenes and motifs in a stratigraphic system on the rock panels, then a relative chronological attribution. We conduct our analysis of these scenes and superpositions with reference to available archaeological data in the region. The analysis of painted scenes of the highlands facilitates discussion of the transition in the south-central Andes between two distinct modes of life in which the management of camelids marks a major turning point for the inhabitants of the region.

3.2. Scenes in rock art

In Chilean rock art, Gallardo (2009) recognizes that the

compositions can be organized around a clear narrative system, at the same time presenting a symbolic construction. The analysis of the compositions allows for the identification of scenic structures unique to each cultural group. As principles of composition, Gallardo identifies, for example: *symmetry* and *the scene*. The latter is defined as "the place of the action [in terms of physical space], in its development or representation, and constitutes a unity characterized by the presence of the same actors. [...] a scene in rock art corresponds to a representation in which the figures are related in a common activity" (Gallardo, 2009: 86–87; translated from original Spanish). Each composition thus establishes a relationship between the figures connected in an identifiable activity that can be recognized as a *scene*. Of course it is necessary to confirm if the scene were original painted as a scene or the product of several reprisals over time that led to the configuration of scene different from the original.

In the same sense as Gallardo, Lenssen-Erz (1992) proposes an analytical approach to the term *scene*. In order to recognize a logical rapport between the figures, the author proposes to favor

coherence in the comparative system. Thus the genre, the style, the posture, the action, the color, and the size are the principle aspects that form the basis of the definition of a coherent representation or *scene*. Our data lend themselves easily to this first analytical stage because the homogeneity of certain figures stands out in terms of color and style. In a corpus of 804 figures for the 6 sites analyzed here, a hundred of the scenes were recorded, for which the first classification focused on isolating scenes of human/animal interaction from those representing solely animals or solely humans (Table 1). These latter two constitute less than a third of the total scenes. The majority of scenes are composed of a *mise-en-scene* that centers on a human/animal interaction.

Lenssen-Erz specifies that the description should concentrate on the “focus” chosen by the artist in order to highlight the representation of certain elements or a movement and an activity at the heart of the scene (1992: 97). In the paintings in the highlands of the far north of Chile, it appears that emphasis is placed on the interactions between humans and animals and structural analyses reveal, at first blush, a tendency toward the valorization of camelids, which are the objects of all attentions. Even so, this format varies and the roles between the camelids and the anthropomorphs are more evenly shared or even reversed over time. The evidence for this transformation of scenic structures, notably the inversion of proportions of animal/human figures, lends a new profundity to these artistic representations by presenting not only thematic changes but also new projections of humans in their symbolic system. As a rendering of the socio-economic universe of highland populations, the pictorial scenes allow us to analyze the evolution of methods of subsistence practices, notably the slow transition toward new hunting practices and the advent of practices of domestication and herd-management that were concurrent with a reconsideration of humans and their place in their environment.

3.3. The study of superpositions

Vilacaurani and Incani are the most significant rock art painting sites in the upper Lluta valley and almost certainly in the *Precordillera* of northernmost Chile as well. The number and extent of the paintings is further enriched by a complex system of superposition of figures that can reach four overlapping levels. These layers can be also discerned on the basis of accumulations of paints of different colors and tones on the same panel. The methodology adopted made a distinction between two types of superposition: direct and indirect. Direct superpositions represent a corpus of figures in which the system of superposition can be perceived based on colors, styles, and themes. The nature of palimpsests on certain panels attests to the continuity in the pictorial tradition, as the artists seem to have chosen certain motifs to superimpose as if to reactivate their significance, enter into the graphic heritage, or reanimate their appropriation of a space (Aschero, 1988, 1996; Gallardo, 2001; Berenguer, 2004; Arsenault, 2008; Nash, 2012). On the basis of these observations, a schema of the layering structure of colors is proposed (Fig. 2). In addition to figures in direct superposition, a system of indirect superposition has been identified, on the basis of extrapolating an observed sequence of overlapping colors to the ensemble of a panel and a site. This

working hypothesis has allowed us to situate an ensemble of figures and of scenes into phases of execution of panels, which are then verified with reference to other elements: stylistic, structural, thematic.

Stylistic analysis based on the classification of colors and themes was undertaken in an effort to understand variations in the system of representation and projection of highland populations. The cultural universe of the artists is conditioned by the values and world-view carried by the group. Stylistic transformations can reflect profound shifts that respond to or condition changes in ways of life (Cauvin, 1997).

4. Results and discussion

4.1. Scenes in the precordillera from northernmost highlands

In the highlands of the studied region, the observation of rock art scenes presented the opportunity for descriptive analyses of the represented activities from fairly early on (Niemeyer, 1972; Santoro and Chacama, 1982; Santoro and Dauelsberg, 1985). Practices clearly linked to social and economic life in relation to camelids were identified, such as hunting with lassos or bolas, the *Chaccu* (a collective hunting technique), herding or transport in caravan of llamas.

For the current study, we have identified five types of interaction: *hunting* in which an animal is chased or even injured by one or more armed anthropomorphic figures; *capture*, which is distinguished from the hunt by the use of a trap or snare; *confinement*, indicated by drastic restriction of the movement of animals; *husbandry* or herding, indicated by the implementation of strategies for the protection or care animals; and *grazing*, represented by the movement of a herd accompanied by a human figure identified as a shepherd. Among scenes of human-animal interaction, only thirty-three could be clearly identified as depicting a specific socio-economic activity (Table 2).

Hunting scenes are the most numerous, but we must point out that this activity is not chronologically restricted, as hunting is a clearly established activity in all periods, including pastoralist and agricultural contexts. In contrast, scenes of husbandry and grazing can only be associated with those specific chronological phases in which domestication is known. The presence of scenes of both capture and confinement at all sites could be indicative of a correlation between these two practices. The theme of capture is represented in composition of large scale that covers the most exposed areas of the panels and is present at all of the sites (Table 2). Even if this practice had an important economic role, the artistic investment in its depiction suggests another function of symbolic significance.

4.2. The choice of colors and superposition

During the analysis of the panels, we have shown that pigments of different colors were not used at random. The order in which the colours are superimposed follows a constant pattern (Table 3). This table represents the overlay levels observed in the main sites: Vilacaurani and Incani.

Table 1

Classification of scenes: number of scenes by theme.

Distribution scenes				
Type of scene	Anthropomorphic scenes	Ethologic scenes	Human/animal	Total
Number of scenes	6	25	73	104
Number of involved figures	32	71	336	439

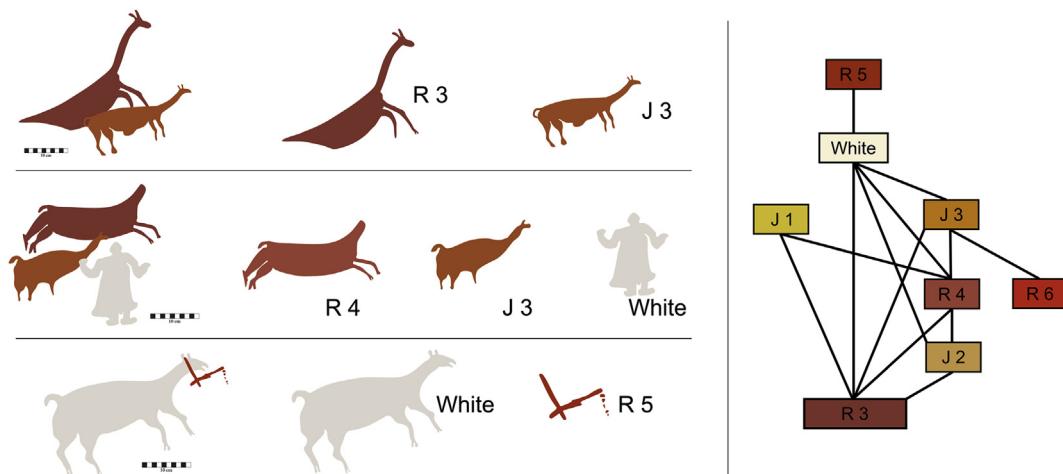


Fig. 2. System of superposition, Incani I, Panel 1: example of decoding of the system of direct superpositions and the resulting diagram of these superpositions.

Table 2

Distribution of various types of scenes showing humans and animals interacting in the three sites.

Human/animal scenes

	Hunting	Capture	Confinement	Husbandry	Grazing	Total
Vilacaurani	4	2	1	3	5	15
Incani	7	2	1	4	1	15
Anocariri	/	2	1	/	/	3
Total	11	6	3	7	6	33

Table 3

List of directs superposition in Vilacaurani and Incani sites.

Vilacaurani direct superpositions								
inf/sup	R3	R4	R5	R6	J1	J2	Grav	Total
R1	1	5		1			5	14
R2	1	11	1	1			7	22
R3		3			2	3	2	10
R4						6	1	7
R5								0
R6							1	1
J1								0
J2		3	1				1	5
J3								0
B1								0
N							1	1
grav		2	1					3
								63

Incani direct superpositions								
inf/sup	R3	R4	R5	J1	J2	J3	B1	Total
R1								0
R2								0
R3		2	1	3	1	5	4	16
R4		1		1		7	4	13
R5								0
R6								0
J1								0
J2	1	1	1	1			2	6
J3		1				2		3
B1			2	1				3
N								0
grav								0
								41

Colors employed vary by site, with the use of white and cream colors restricted to the site of Incani. Even so, the majority of

paintings are dominated by red and yellow/orange hues that form an overall homogenous palette of colors (Fig. 3). Our analyses have allowed us to identify a combination of direct superposition of color that occurs at two sites. Dark reds form the basal layers upon which yellow was superimposed; this pattern is attested to in several dozen instances. These variations cannot be attributed to issues of conservation or degradation (Casanova, 2009).

More pronounced inter-site differences are evident in the superior layers, in terms of color-choice and technique. At Vilacaurani, bright yellows and engraving are more common in the final layers, while at Incani white and bright red dominate the final pictorial features. This pattern forms the basis for the stratigraphic sequence of colors and phases of execution of the panels. The figures in dark red are the oldest, and these colors seem largely dispersed at numerous rock art sites in the region (Sepúlveda et al., 2013).

4.3. Stratigraphy of scenes

Some scenes are directly integrated in a system of superposition, and their description reveals certain principal differences between the various layers. At Incani I, on the central panel (Fig. 4a), the oldest scenes are painted in dark red and depict a group of camelids with an absence of human figures. In the layer above this, there is a hunting scene in which a man has launched a projectile at the back of an animal that is bringing up the rear of the heard. A pastoral scene covers the panel to form the final layer.

At Vilacaurani, two cases of direct superposition present two fairly different scenarios. In the inferior layer of the large panel

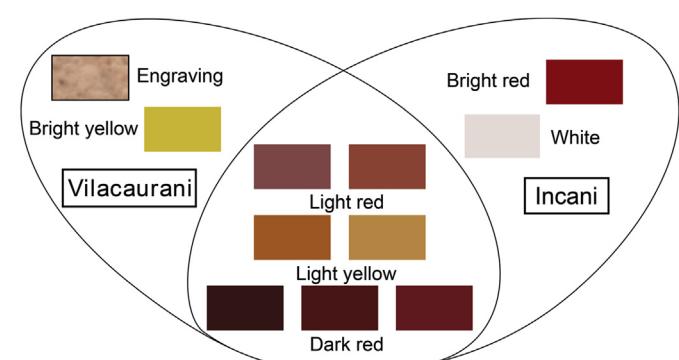


Fig. 3. Venn diagram of the distribution of superimposed colors by site.

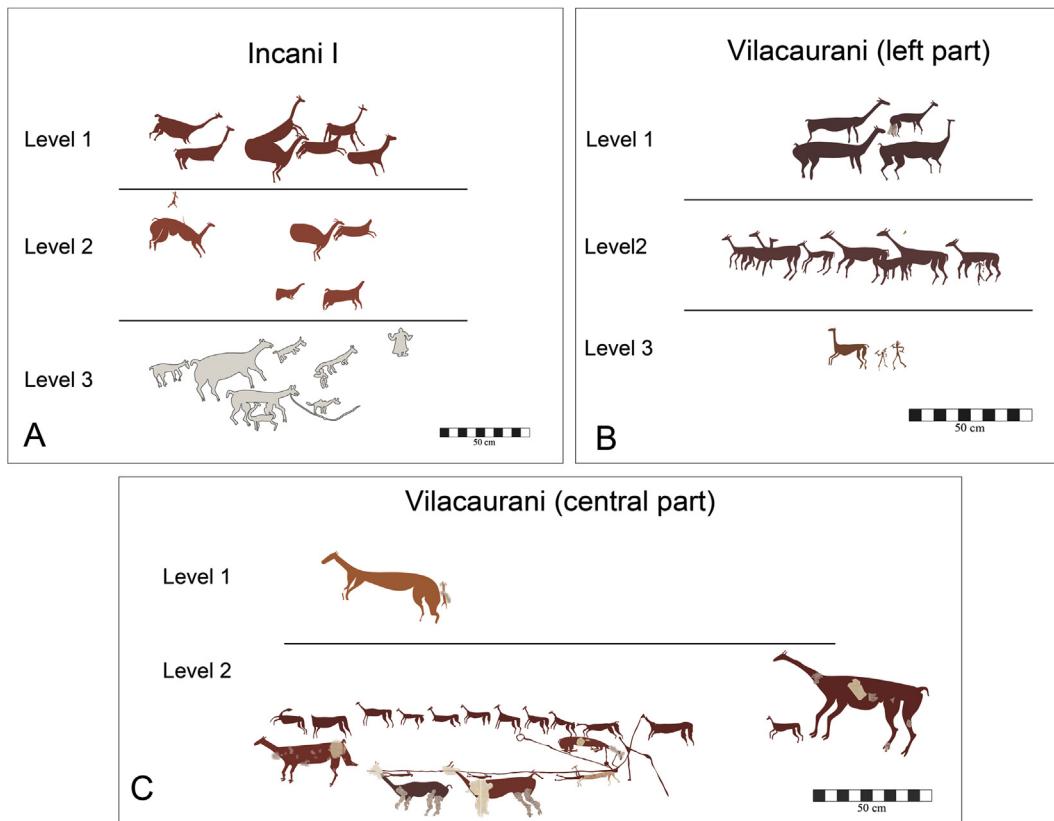


Fig. 4. Scheme of the superpositions at Vilacaurani and Incani. a) Incani I; b) Vilacaurani, left section of the Great Panel; and c) Vilacaurani, central section of the Great Panel.

(Fig. 4b), a group of camelids in dark red underlies a scene of the pastoral type (a representation of an anthropomorphic figure in proximity to a group of camelids with young). Over this is a hunting scene, this time with two armed individuals in pursuit of a camelid. At the center of the large panel (Fig. 4c) a hunting scene with single animal and a single human is positioned beneath the large, central capture scene. The latter shows a substantial technical investment, with the elaboration of a trap of the snare type. This system allowed for the capture of several animals, and most importantly their live capture for uses other than slaughter for meat. The ultimate intervention on this panel was a recent human destruction, made by deeply pecking the legs and heads of the animals. This first reading of stylistic superposition allowed us to establish for certain panels a phase dominated by scenes of camelid groups (without human presence), followed by diverse forms of human-camelid interaction that range from direct hunting to trapping and finally husbandry. The results of these preliminary observations show, through patterns of superposition, that recourse to hunting occurred even in agro-pastoral contexts.

The preliminary observation of the direct superpositions of scenes is then paired with an analysis of superpositions of colors to permit the integration of isolated scenes into the constructed sequences. The scenes in dark red are those of camelids, generally in herds and without the presence of humans (Fig. 4b). The hunting scenes appear in a subsequent phase in red or light yellow. The scenes of capture appear in a range of light reds (Fig. 5). More or less complex traps (Fig. 5a and b) are executed in the same color as in the scenes of confinement (Fig. 5c). This observation reinforces the direct rapport between scenes of trapping and scenes of confinement. The pastoral scenes present a greater variety of color (Fig. 6a, b, and 6c), including shades of white and cream, though the light reds persist (Fig. 6a). To this category we can add the so-called

“recent” hunting scenes that are sometimes superimposed on scenes of herding and share with them a varied color palette that includes bright yellows (Fig. 6d, e, and 6f). This aspect of the study shows that there is colorimetric and thematic coherence in the system of superposition of scenes. The scenes depicting herds of camelids belong to the oldest phases and are quickly supplanted by the numerous representations that favor human-animal interaction. In a range of similar colors, the hunting scenes give way to scenes of capture and confinement that demonstrate an intensification of human control exerted over the animal. Another period is visible during which the range of colors widens appreciably and the themes shift to pastoralism, with a persistence of camelid-hunting. The consistent similarities between sites in terms of colors and themes has allowed us to establish a relative chronology of scenes and revealed thematic sequences that play out on the rock walls over the passage from the Archaic to Formative period.

4.4. Superposition and stylistic variations

If exclusively 33 scenes depicting human-animal interaction are analyzed, a clear pattern emerges in the ensemble of sites studied. The relative chronology of these scenes was revealed by the overlay system (Fig. 7). The oldest scenes focus on the moment of spear-throwing, with a notable disproportion in size between humans and camelids. The human form is also simplified while the anatomical details of the camelid are pronounced (Fig. 7a). This scene carries a strong symbolic message in which the image of the camelid is sublimated. In contrast, in the more recent hunting scenes, we can see a new image of the human form and more balanced proportions between the human and animal figures (Fig. 7b). The action represented in this scene is the pursuit of prey, the camelid, which is still represented in anatomical detail but

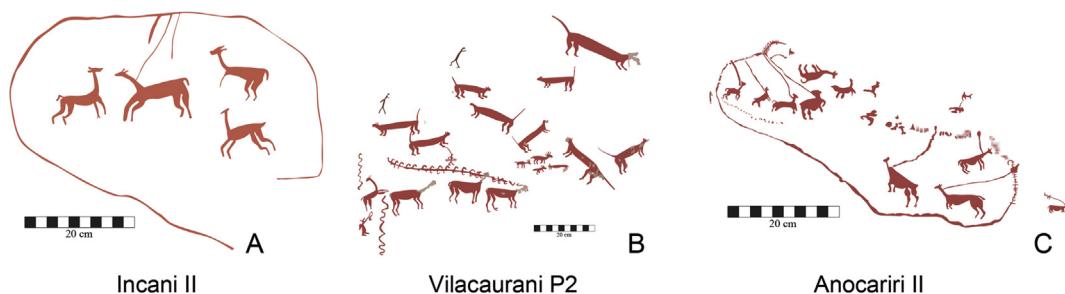


Fig. 5. Relationship between color and scenes. Scenes of capture and confinement in the range of light reds: A) Incani II; B) Vilacaurani Panel 2; C) Anocariri II. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

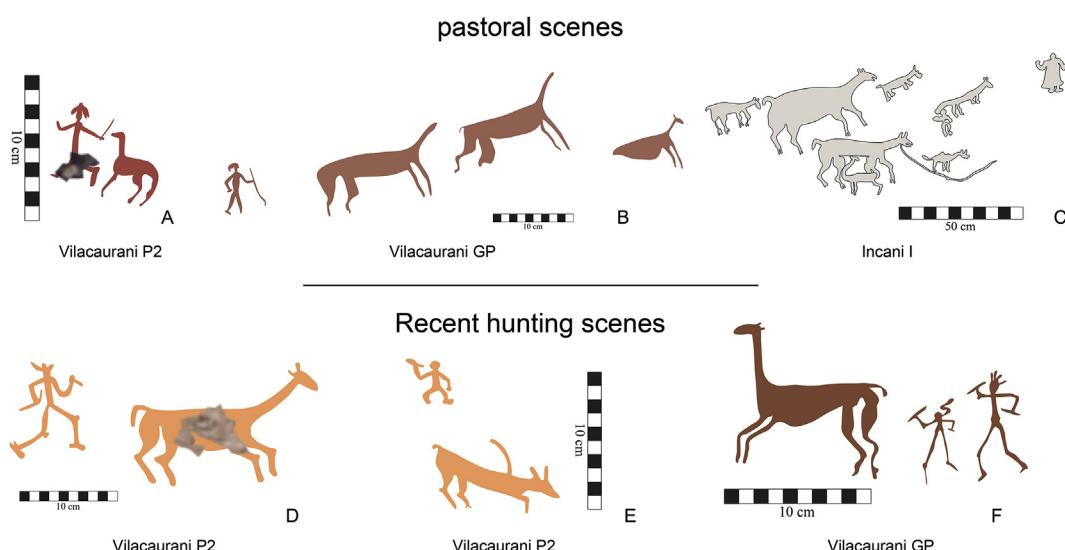


Fig. 6. Relationship between color and scenes. Pastoral and recent hunting scenes at Vilacaurani (A, B, D, E, F) and Incani (C). (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

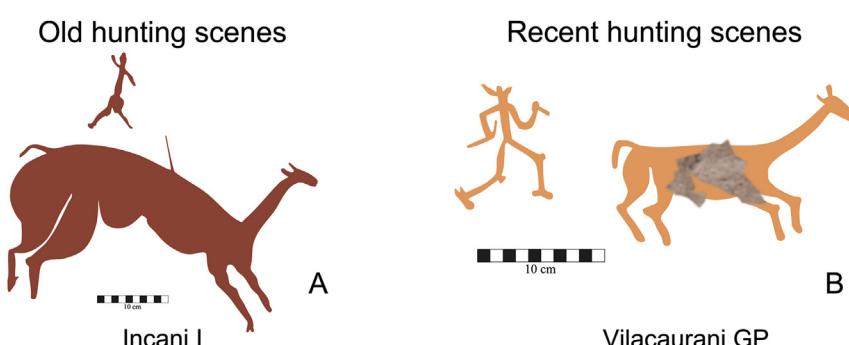


Fig. 7. Relative human/animal sizes. A) Early hunting scene at Incani I showing a substantial disproportion in the size of the human and the animal; B) Recent hunting scene at Vilacaurani Great Panel showing a better equilibrium between the human and the animal.

reduced in size with respect to the human figure that dominates the scene. The human figure is transformed, with numerous elements now represented (headdresses, joints, feet) and where all place this figure in a new light in the human-animal encounter. The importance assumed by the human figure, isolated or in a group, increases progressively in scenes of capture and confinement (Table 4). The human figure remains thin, but new stylistic techniques are used to reproduce gestures and expressions. Anthropomorphs are represented both face-on and in various profiles, which allows for the accentuation of different gestures (Fig. 8a). The

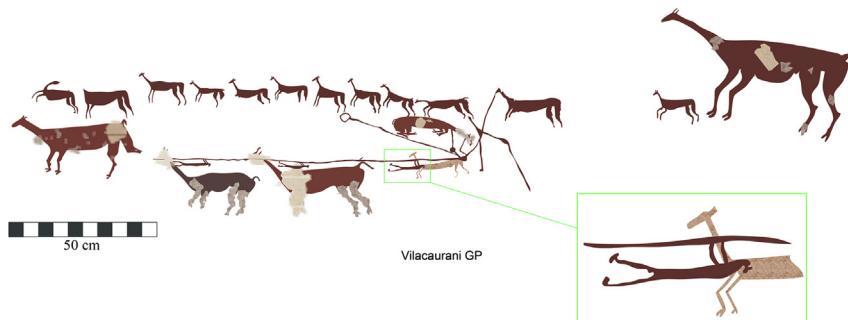
activities are also more and more detailed: humans manage animals; they use specific objects and hunting weapons that are clearly recognizable as spear-throwers (Fig. 8b). The structure of scenic discourse changes, and accords a greater place to human activities, which are still conducted in relation with camelids. At the same time that the interactions between humans and animals become increasingly complex, the scenes adopt a new point of view and artistic adaptations are made to give a specific place to the humans in them. This phase, during which technological innovations are depicted, coincides with the transformation of the

Table 4

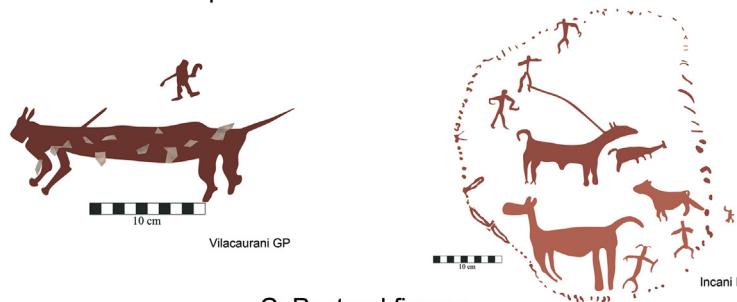
Variation of the number of human figures participating in scenes with animals.

Number of human figures participating in scenes with animals	Old hunting	Capture/Confinement	Recent hunting	Husbandry/Grazing
Number of scenes	3	9	8	13
Number of anthropomorphs	3	39	41	14

A : Complex trap and new human representation



B: Propulsor or arms in human activities



C: Pastoral figures



Fig. 8. Increasing complexity of human figures. A) snare-hunting scene with detail of the human figure (Vilacaurani GP); B) representation of hunting weapons at Vilacaurani GP and Incani III; C) variety of representations of herders (Vilacaurani P2, GP, Incani GP). GP = Great Panel.

human figure, in pastoral scenes in which the human figures continue to be individually distinguished by accessories and/or attire (including headdresses) (Fig. 8c). Through this process greater attention was placed on the herder, an isolated figure, for which the standard template became marked by a particular headdress and the possession of a rod. A significant structural change emerged from this analysis, through which style and the composition of scenes tended to place greater emphasis on the human figure and its activities. The transformation in human-animal relationships on the economic and technological places manifested clearly in the cultural sphere.

4.5. Scenes, superpositions and archaeological context

There are numerous correlations between the six study-sites in terms of the patterns in color use, stylistic choices, and scenes. Up to the point at which capture and confinement scenes appear, the

paintings at the different sites display a certain homogeneity, such the groups seem to be representing the same socio-economic and cultural processes. The emergence of a new socio-economic context was accompanied by an affirmation of the human image. Supplanting camelids as the central figures of the scenes, anthropomorphs assumed a graphic importance that indicates a reevaluation of the human in the environment and in structure of society. Animal domestication turns out to be one of the pivotal event in these changes, as the first signs of affirmation of the human figure appear in the scenes of capture and confinement. With the appearance of capture scenes, stylistic disparities between the sites start to appear beginning with color choice, which constitutes the first divergence. The human figure, a herder, occupies a central place of importance in this society, though hunting persists. The latter shows a continuity of practice that would have supplemented meat resources and/or conferred a certain status within these societies.

The available archaeological data from nearby sites show that, beginning in the Late Archaic, the lithic industry displays both diversification and miniaturization that are interpreted as evidence of shifts in hunting techniques (Santoro and Chacama, 1982). A profound restructuring of provisioning strategies took place, and scenes of trapping confinement may have played a role in the reconfiguration of animal-management strategies, which were not restricted in their focus to alimentary resources. The study of faunal remains does not show a substantial change in the types of prey hunted between the Archaic and Formative periods (Castillo et al., 2014). Likewise, the lithic materials do not show large differences, except where raw materials are concerned; in which case variation in strategies of reduced mobility and resource-procurement appear to vary over time (Osorio et al., 2016). Other artifacts provide also evidence of changes from the Late Archaic to the Formative, such as the appearance and spread of ceramics (Santoro and Chacama, 1982) or the presence of some non-local and prestige goods that signal new social relationships within local groups and different forms of interaction with more sedentary and established groups in the neighboring regions of the coast and *Altiplano* (Castillo and Sepúlveda, 2015). It can be said, therefore, that socio-cultural practices characteristic of Archaic hunter-gatherers show some continuity over time, even during times laps which correspond in other regions to the Formative Period (Sepúlveda et al., 2013), with a reduced mobility that could allow to develop notions of territory (Raffestin, 1977; Guilaine, 2011). But in contrast to adjoining regions (Nuñez and Santoro, 2011) in our study-region hunter-gatherers communities preserved their way of life (Osorio et al., 2016), and similarities in the rock art seem to indicate the construction of a common cultural landscape in the piedmont of southern Peru and northern Chile (Sepúlveda et al., 2013). Art also attests to changes of certain practices related to the management of camelids. Thus, even if the population of the *precordillera* did not abandon hunting and gathering, pastoralism took on greater and greater importance for these mobile people with nomadic lifestyles.

Our results can also be placed in a larger regional context in which we find numerous signs of societies with more evident changes and transformations. The transition from hunter-gatherer to pastoral subsistence practices entailed a reformulation of scenography and of the image of humans in andean rock art, similar to what is observed in other regions in South Central Andes (Berenguer, 1999; Dudognon and Sepúlveda, 2015; Guffroy, 1999; Klarich and Aldenderfer, 2001; Gallardo, 2001, 2004; Aschero, 2006; Nuñez et al., 2006; Gallardo and Yacobaccio, 2005, 2007).

5. Conclusion

Painted rock art in the *Precordillera* extends over a network of sites that constitute sources of data that can be exploited at several levels of analysis. The scenes present interesting elements of technological adaptation and the symbolic reconsiderations related to socio-economic changes in the Andes region, generally identified with the passage from the Archaic to Formative Period. Scenes turn primarily on the relationship between humans and animals, which is at the center of the socio-economic and ultimately the symbolic and cultural sphere of the highland populations. From hunting techniques to pastoral practices, a wide range of intermediary activities are represented on the rock walls. Technological transformations visible on the painted walls of the upper Lluta valley are related to new strategies of resource-provisioning in which traps replace the felling and slaughter of prey animals. Scenes of capture are related to scenes of confinement and the two appear simultaneously. Techniques tend progressively toward the acquisition of camelids from which pastoralism eventually emerged.

Artistic novelties accompanied socio-economic change and the

image of humans underwent the most substantial transformations. Not only were images of humans enriched, but the central foci of the scenes also shifted distinctly to human activities. While the stylistic characteristics of the camelids remained more or less stable over time, depictions of humans were profoundly modified as they became central to the scenes that focused on direct human action on the animal world. A strong visual shift therefore appears to accompany the passage from hunting to pastoralism. The human figure is reworked and seems to serve a new discursive purpose. The cultural universe of Late Archaic populations shows a fundamental pattern whereby reduced mobility precipitates a reevaluation of identity appropriate to the emerging territoriality of groups.

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References

- Aldenderfer, M., 1990. Cronología y definición de fases arcaicas en Asana, Sur del Perú. *Chungará Revista de Antropología Chilena* 24/25, 13–35.
- Aldenderfer, M., 1998. Montane Foragers, Asana and the South-central Andean Archaic. University Iowa Press, Iowa City.
- Aldenderfer, M., 1999. The Pleistocene/Holocene transition in Peru and its effects upon human use of the landscape. *Quat. Int.* 53 (4), 11–19.
- Aschero, C., 1996. Arte y Arqueología: una visión desde la puna Argentina. *Chungará Rev. Antropol. Chil.* 28 (1/2), 175–197.
- Aschero, C.A., 1988. Pinturas rupestres, actividades y recursos naturales: un encuadre arqueológico. In: Yacobaccio, H. (Ed.), *Arqueología Contemporánea Argentina. Actualidad y Perspectivas*. Ediciones Búsqueda, Buenos Aires., pp. 109–145.
- Aschero, C., 2006. De cazadores y pastores. El arte rupestre de la modalidad río Punilla en Antofagasta de la Sierra y la cuestión de la complejidad en la Puna Meridional Argentina. In: Fiore, D., Podestá, M. (Eds.), *Tramas en la piedra. Producción y Usos del Arte Rupestre*. Altuna Impresores, Buenos Aires, pp. 103–142.
- Arsenault, D., 2008. De la matérialité à l'immatérialité : les sites rupestres et la réappropriation du territoire par les nations algonquiennes. *Rech. Amérindiennes au Québec* 38, 41–48.
- Berenguer, J., 1999. El evanescente lenguaje del arte rupestre en los Andes Atacameños, in Arte Rupestre en los Andes de Capricornio. In: Berenguer, J., Gallardo, F. (Eds.), *Arte rupestre en los Andes de Capricornio*. Museo Chileno de Arte Precolombino, Santiago, pp. 9–56.
- Berenguer, J., 2004. Cinco milenios de arte rupestre en los Andes Atacameños: imágenes para lo humano, imágenes para lo divino. *Bol. del Mus. Arte Precolomb.* 9, 75–108.
- Bonavia, D., 1996. Los Camélidos Sudamericanos. Instituto Francés de Estudios Andinos, Lima.
- Casanova, P., 2009. Diagnóstico de conservación de los sitios de pintura rupestre de la precordillera de Arica (norte de Chile). Unpublished report for the Project FONDECYT 11060144.
- Castillo, C., Goepfert, N., Sepúlveda, M., Saintenoy, T., 2014. Caracterización y síntesis del uso/consumo animal a lo largo de la secuencia arqueológica de la precordillera de Arica en el norte de Chile (área Centro Sur andina). San Rafael Mendoza, Argentina. Unpublished paper prepared for International Conference of Archaeozoology.
- Castillo, C., Sepúlveda, M., 2015. ¿Movilidad o interacción?: objetos “no utilitarios” en contextos Arcaico Tardío del extremo norte de Chile. In: Sepúlveda, M., Alday, C., Castillo, C., Oyaneder, A. (Eds.), *XIX Congreso Nacional de Arqueología Chilena. Sociedad Chilena de Arqueología*, Arica, pp. 161–172.
- Cardich, A., 1964. Lauricocha, fundamentos para una Prehistoria de los Andes centrales. Centro Argentino de Estudios Prehistóricos, Buenos Aires.
- Cartajena, I., Núñez, L., Grosjean, M., 2005. Animal utilization and camelid domestication in the Atacama Desert 13000–3500 cal. BP. In: Paper Presented at 2nd Southern Deserts Conference: Human-environment Interaction in Southern Hemisphere Deserts. Past, Present and Future. Arica.
- Cartajena, I., Núñez, L., Grosjean, M., 2007. Camelid domestication on the western slope of the Puna de Atacama, Northern Chile. *Anthropozoologica* 42, 155–173.
- Cauvin, J., 1997. Naissances des divinités, naissance de l'agriculture. CNRS Editions, Paris.
- Cerrillo Cuenca, E., Sepúlveda, M., 2015. An assessment of methods for the digital enhancement of rock art paintings: the rock art from the precordillera of Arica

- (Chile) as a case study. *J. Archaeol. Sci.* 55, 197–208.
- Dudognon, C., Sepúlveda, M., 2013. Hunting practices in rock art, Sierra Arica (far North of Chile). In: XXV Valcamonica Symposium, art as a source of history. Edizioni Del Centro, Capo di Ponte, pp. 237–242.
- Dudognon, C., Sepúlveda, M., 2015. Camelids and anthropomorphics style variations in the north Chile's rock art during Archaic and Formative transition. In: XIX International Rock Art Conference IFRAO, Mérida. ARKEOS, vol. 37, pp. 217–230.
- Gallardo, F., 2001. Arte rupestre y emplazamiento durante el Formativo Temprano en la cuenca del río Salado (Desierto de Atacama, norte de Chile). *Bol. del Mus. Chil. Arte Precolomb.* 8, 81–95.
- Gallardo, F., 2004. El arte rupestre como ideología: un ensayo acerca de pinturas y grabados en la localidad del río Salado (Desierto de Atacama, Norte de Chile). *Chungará Rev. Antropol. Chil.* 36 (1), 427–440.
- Gallardo, F., 2009. Sobre la composición y la disposición en el arte rupestre de Chile: consideraciones metodológicas e interpretativas. *Magallania* 37 (1), 85–98.
- Gallardo, F., Yacobaccio, H., 2005. Wild or domesticated? Camelids in the early formative rock art of the Atacama Desert (Northern Chile). *Lat. Am. Antiq.* 16 (2), 115–130.
- Gallardo, F., Yacobaccio, H., 2007. ¿Silvestres o domesticados? Camélidos en el Arte Rupestre del Formativo Temprano en el Desierto de Atacama (Norte de Chile). *Bol. del Mus. Chil. Arte Precolomb.* 12, 9–31.
- García, M., Sepúlveda, M., 2011. Contextos vegetales de aleros con pinturas (Precordillera de Arica, Norte de Chile). *Estud. Atacameños* 41, 97–118.
- Guffroy, J., 1999. El arte rupestre del antiguo Perú. Institut Français des Etudes Andines, Lima.
- Guilaine, J., 2011. Caïn, Abel, Ötzi. L'héritage Néolithique. Gallimard, Paris.
- Izeta, A., 2008. Late Holocene camelid use tendencies in two different ecological zones of northwestern Argentina. *Quat. Int.* 180, 135–144.
- Kaulicke, P., 2007. Simplificación y complejización de la complejidad social temprana: una introducción. *Bol. Arqueol. PUCP* 11, 9–22.
- Klarich, E., Aldenderfer, M., 2001. Qawrankasax Waljawa: arte rupestre de cazadores y pastores en el río Llave (sur del Perú). *Bol. del Mus. Chil. arte Precolomb.* 8, 47–58.
- Lavallée, D., 2006. Secuencias y consecuencias de algunos procesos de neolitización en los Andes Centrales. *Estud. Atacameños* 32, 35–41.
- Lavallée, D., Julien, M., 1980. Un aspect de la préhistoire andine : l'exploitation des camélidés et des cervidés au formatif dans l'abri de Telarmachay (Junin, Pérou). *J. de Société des Américanistes* 97–124.
- Lavallée, D., Lumbreras, L., 1985. Les Andes de la préhistoire aux Incas. Gallimard, Paris.
- Lenssen-Erz, T., 1992. Coherence –A constituent of 'scenes' in rock art. The transformation of linguistic analytical models for the study of rock paintings in Namibia. *Rock Art Res.* 9 (2), 87–105.
- Lumbreras, L., 2006. Un Formativo sin cerámica y cerámica preformativa. *Estud. Atacameños* 32, 11–34.
- Mengoni Goñalons, G., 2008. Camelids in ancient Andean societies: a review of the zooarchaeological evidence. *Quat. Int.* 185, 59–68.
- Mostny, G., Niemeyer, H., 1983. Arte Rupestre Chileno. Serie Patrimonio Cultural Chileno. Colección Historia del arte Chileno, Santiago.
- Muelle, J., 1970. Las pinturas de Toquepala. In: Ravines, R. (Ed.), 100 Años de Arqueología en el Perú. Instituto de Estudios Peruano, Lima, pp. 151–154.
- Muelle, J., Ravines, R., 1986. Toquepala. Arte rupestre del Perú. Inventario General. INE, Lima.
- Nash, G., 2012. Temporal modes in rock art: how passive superimposition tamed the Iron Age warriors of the Valcamonica, Lombardy, Northern Italy. *Arkeos* 32, 91–102.
- Niemeyer, H., 1972. Las Pinturas de la Sierra de Arica. Editorial Gerónimo de Bibar, Santiago.
- Nuñez, L., 1976. Registro regional de fechas radiocarbónicas del norte de Chile. *Estud. Atacameños* 4, 69–111.
- Nuñez, L., 1982. Asentamiento de cazadores-recolectores tardíos de la puna de Atacama: hacia el sedentarismo. *Chungará Rev. Antropol. Chil.* 8, 137–168.
- Nuñez, L., Cartajena, I., Carrasco, C., de Souza, P., 2006. El templete de Tulán de la Puna de Atacama: emergencia de complejidad ritual durante el Formativo Temprano (Norte de Chile). *Lat. Am. Antiq.* 17, 445–473.
- Nuñez, L., Santoro, C., 2011. El tránsito arcaico-formativo en la circumpuna y valles occidentales del Centro Sur andino: hacia los cambios "neolíticos". *Chungará Rev. Antropol. Chil.* 43 (1), 487–530.
- Osorio, D., Jackson, D., Ugalde, P., Latorre, C., De Pol-Holz, R., Santoro, C., 2011. Hakenasa cave and its relevance for the peopling of the Southern Andean altiplano. *Antiquity* 85, 1194–1208.
- Osorio, D., Sepúlveda, M., Castillo, C., Corvalán, M., 2016. Funcionalidad de sitio de los aleros con pintura de la precordillera de Arica (extremo norte de Chile), durante el período arcaico (10.500–3.700 años a.p.). Una aproximación desde el componente lítico. *Intersecc. Antropol.* 17, 77–90.
- Raffestin, C., 1977. Paysage et territorialité. *Cah. Géogr. Québec* 21 (53/54), 123–134.
- Ravines, R., 1967. El abrigo de Caru y sus relaciones culturales con otros sitios tempranos del sur del Perú. *Nawpa Pacha J. Andean Archaeol.* 5, 39–57.
- Santoro, C., 1989. Antiguos cazadores de la puna (9.000 a 6.000 A.C.). In: Hidalgo, J., Schiappacasse, V., Niemeyer, H., Aldunate, C., Solimano, I. (Eds.), *Culturas de Chile. Desde sus orígenes hasta los áboles de la conquista*. Andrés Bello, Santiago de Chile, pp. 33–55.
- Santoro, C., Chacama, J., 1982. Secuencia cultural de las tierras altas del área Centro Sur Andina. *Chungará Rev. Antropol. Chil.* 9, 22–45.
- Santoro, C., Dauelsberg, P., 1985. Identificación de indicadores tempo culturales en el arte rupestre del extremo norte de Chile. In: Aldunate, C., Berenguer, J., Castro, V. (Eds.), *Estudios en arte rupestre. Primeras jornadas de Arte y Arqueología*. Museo Chileno de Arte Precolombino, Santiago de Chile, pp. 69–86.
- Schiappacasse, V., Niemeyer, H., 1996. Pictografías de los aleros de Itiza y de Mulipungo de la Sierra de Arica. *Chungará Rev. Antropol. Chil.* 28 (1–2), 253–276.
- Sepúlveda, M., Saintenoy, T., Faunes, W., 2010. Rock paintings of the Precordillera region of northern Chile. *Rock Art Res.* 27 (2), 161–175.
- Sepúlveda, M., 2011. La tradition naturaliste des peintures rupestres des groupes de chasseurs-cueilleurs de l'extrême nord du Chili. In: Vialou, D. (Ed.), *Préhistoire des Amériques. Editions du Comité des Travaux historiques et scientifiques*, Paris, pp. 453–464.
- Sepúlveda, M., García, M., Calás, E., Carrasco, C., Santoro, C., 2013. Pinturas rupestres y contextos arqueológicos de la Precordillera de Arica (Extremo norte de Chile). *Estud. Atacameños* 46, 27–46.
- Uribe, C., 2008. Tradición cultural chiribiquete. In: *Rupestreweb* (accessed October 15.2012.). <http://www.rupestreweb.info/chiribiquete2.html>.
- Villagrán, C., Romo, M., Castro, V., 2003. Etnobotánica del sur de los Andes de la primera región de Chile: un enclave entre las culturas altiplánicas y las de quebradas altas del Loa superior. *Chungará Rev. Antropol. Chil.* 35 (1), 73–124.
- Wheeler, J., 1999. Patrones prehistóricos de utilización de los camélidos sudamericanos. *Bol. Arqueol. PUCP* 3, 297–305.
- Yacobaccio, H., 2003. Procesos de intensificación y de domesticación de camélidos en los Andes Centro-Sur. Tercer congreso mundial sobre camélidos. Centro de Investigación en Forrajes, Potosí, pp. 211–216.
- Yacobaccio, H., Cata, M.P., Solá, P., Alonso, M.S., 2008. Estudio arqueológico y físico-químico de pinturas rupestres en Hornillos 2 (Puna de Jujuy). *Estud. Atacameños* 36, 5–28.