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## Was There a Process of Regionalization in Northeastern Patagonia During the Late Holocene?

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### ABSTRACT

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*The objective of this article is to evaluate if changes in the social organization of hunter-gatherer groups from northeastern Patagonia (Argentina) during the Final Late Holocene (ca. 1000–250 years BP) may be understood as a regionalization process. A portion of this region, the lower course of the Colorado River, is taken as a case study. This arid/semi-arid area is part of an ecotone between the Pampas and northeastern Patagonia situated beside the Atlantic coast. Most of the evidence for occupation is concentrated in the Late Holocene, more precisely from 1000 to 250 BP. The archaeological record of this period indicates increased human population, along with a greater intensity of site occupation, the first systematic evidence of coastal occupation, reduced mobility and territoriality, diversification and intensification of subsistence practices, changes in the procurement and use of exotic raw materials, more complex funerary practices, and decreased circulation of specific images in portable artifacts. Based on these data, it is proposed that in some sectors of northeastern Patagonia during the Initial*

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*Late Holocene (3000–1000 BP) relatively open social networks operated, while for the Final Late Holocene (1000–250 BP) relatively closed social networks took their place within a framework of increasing regionalization. Factors relating to the latter are likely to have included demographic packing, spatial circumscription, territorial behaviors, and changes in population dynamics that were accompanied by social differentiation and more intense and competitive social interaction networks.*

**Keywords** hunter-gatherer groups, Late Holocene, northeastern Patagonia, regionalization, social differentiation

## INTRODUCTION AND OBJECTIVES

Regionalization refers to a sociocultural compartmentalization of the landscape as part of the emergence of a new socio-demographic order (David and Lourandos 1998). The process entails more closed social systems and greater territoriality, which together regulate access to both resources and people (David and Lourandos 1998; Gamble 1982; Gonzalez Morales 1991; Guilfoyle 2005). The consequences of more relatively closed social systems can include mechanisms such as greater demography, territorial constraints, landscape markers (e.g., rock art, cemeteries), greater intensity in the occupation of sites and regions accompanied by a higher rate of discarded artifacts, formalized residential bases (intensively used and reoccupied through time), more intensive occupation of sections of the landscape that were previously ignored (marginality), specialization, diversification and intensification processes relating to food resources, introduction of new types of tools and technologies, changes in funerary practices, aggregation, more complex ceremonies (e.g., ritual, feasting), widespread exchange patterns and more formalized exchange of goods, landscape building and “management” of resources, and the emergence of hierarchies and social relationships not necessarily based on kinship, among others. The construction of regional identities as part of the emergence of social differentiation is expected as part of this process. However, even though networks may become more closed, they remain “inclusive” because they still allow contacts between persons and groups, albeit with different intensities through time,

and thus permit integration at different levels. The process defines “regional behaviors” that generate distinctive archaeological correlates which we explore in this article.

Regionalization has been addressed from the study of rock art (David and Lourandos 1998) and also from other kinds of evidence, such as the use of rocks and lithic technology (Guilfoyle 2005). In this article we mainly follow the model proposed by David and Lourandos (1998; see also Lourandos 1997). Through studying the regionalization of rock art, these authors postulate that this process is the result of the interplay of factors such as environment (e.g., changes in productivity), demography (e.g., increase in population and modes of occupation of the landscape) and socio-cultural issues (e.g., socio-political organization of territoriality). Important changes in hunter-gatherer organization (e.g., subsistence, technology, settlements, mobility, territoriality, demographic packing, spatial circumscription, competition, and violence, among others) have been proposed for the Final Late Holocene in the north Patagonia and Pampas regions of Argentina (Barberena 2013; Barrientos and Perez 2004; Berón 2012; Favier Dubois et al. 2009; Martínez and Mackie 2003–2004; Mazzanti 2006; Politis 2008; Prates 2008). Within Argentina, regionalization as a process has been treated analytically with varying degrees of depth in the Pampean region (Mazzanti 2006), southern Patagonia (Charlin and Borrero 2012; Re et al. 2009), the northwest of the country (Aschero and Hocsman 2011), and the Fuegian Channels of its far south (Zangrando 2009).

In this article we introduce another case study in order to explore if there was a

process of regionalization as part of the social reorganization experienced by northeastern Patagonian hunter-gatherers since ca. 1000 BP (Final Late Holocene). For this purpose we analyse the archaeological evidence from one area of northeastern Patagonia, the lower course of the Colorado River. As part of exploring the regionalization process we also wish to evaluate the meaning of relatively more closed social systems and the implications of territoriality. In this sense, we consider that a socially partitioned landscape with strong territoriality should not necessarily indicate that regionalization took place. We are thus interested in exploring to what extent - and with what evidence - increased territoriality can be interpreted as part of a regionalization process. Naturally, the process operates on widespread spatial scales and we therefore interpret our results in the light of archaeological knowledge from a broader macro-region (the Pampas and northern Patagonia).

#### STUDY AREA: ENVIRONMENT, RESOURCES, CLIMATE, AND PALEOCLIMATE

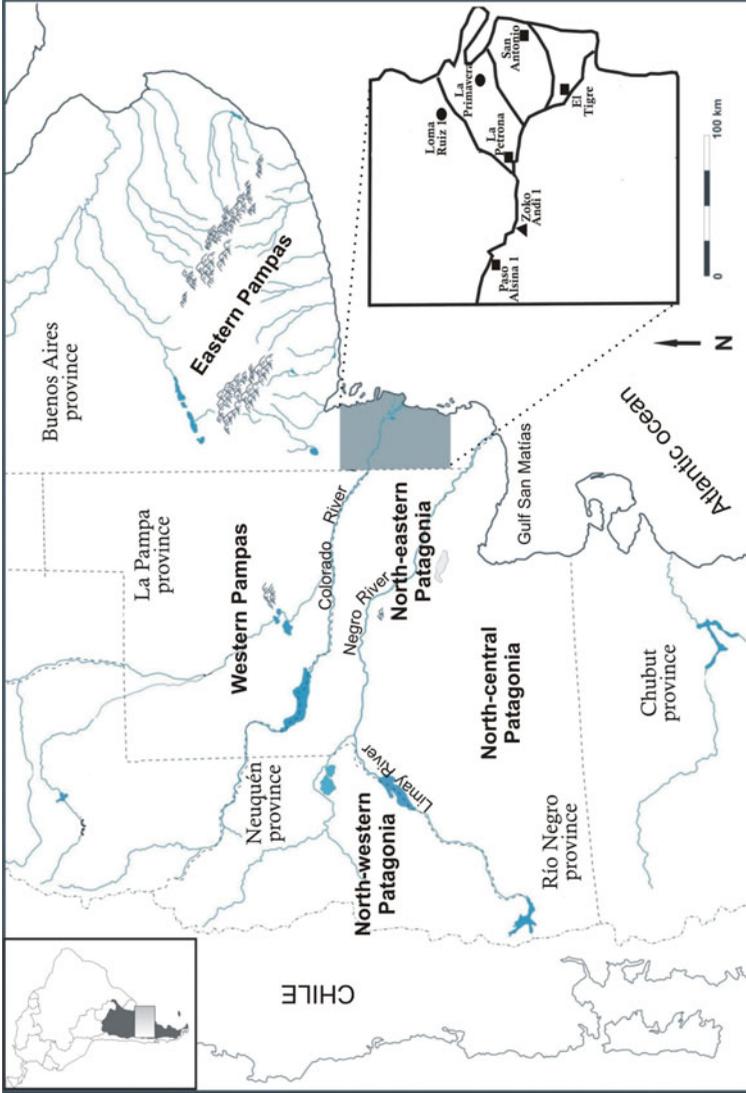
The Colorado River cuts across Argentina from the Andes to the Atlantic Ocean (Figure 1). Its lower course forms part of the so-called *Diagonal Árida* (or Arid Diagonal; Abraham de Vázquez et al. 2000) and is an ecotone of the Pampean-Patagonian transition. Despite this transitional situation, for analytical purposes the sector is treated as part of northeastern Patagonia. It is an arid steppe with a dry temperate climate (Morello 1958; Villamil and Scofield 2003). The river ends in a delta, the estuary of which is characterized by high biological productivity. Ungulates, large and small birds, marine and freshwater fish, rodents, and armadillos are the area's most conspicuous fauna.

Plant communities form a diverse and mixed xerophytic open forest belonging to the *Monte*, *Espinal*, and *Patagonica* provinces (Morello 1958). Archaeological sites are located from beside the sea to ca. 100 km inland. Arid to semi-arid environments placed near the ocean have some advantages relating to their higher and sus-

tained productivity, more temperate climatic conditions, and higher water table levels (Bailey and Milner 2002–2003; Borrero and Barberena 2006; Favier Dubois et al. 2009).

This coast has suffered geomorphological transformations since Middle Holocene times due to the effects of transgressive and regressive sea events. Nevertheless, the northeastern Patagonian coast was not evenly transformed, and remarkable geomorphological differences exist along this littoral coastal fringe. On the one hand, the north portion of the coast (e.g., the Colorado River and its delta) is characterized by the absence of cliffs and a gentle slope and extended low beaches. By the Middle Holocene, marine geofoms are identified approximately 8 km inland (Weiler 1983). On the other hand, in the south section of the coast (e.g., the San Matías Gulf; Figure 1) an alternating pattern of low-lying and abrupt coastal cliffs is recorded, and severe coastal transformation operative since ca. 6000 BP is only evident up to about 1 km inland of the current Atlantic coast (Favier Dubois and Kokot 2011). Although generalizations are difficult to establish due to these differences, in general terms coastal landscapes acquired similar conditions to those of the present after 1800–1000 BP (Favier Dubois and Kokot 2011; Martínez and Martínez 2011). These dynamics affected the availability of both inhabited spaces and resources.

Inland areas, especially fluvial valleys that may be considered as “corridors,” also offered important sources of resource diversity and productivity. Thus, in spite of their arid to semi-arid regimes, both the coast and the inland fluvial valleys have a high biodiversity and bioproductivity that potentially encouraged the settlement of hunter-gatherer populations. Rocks suitable for knapping are present in the study area in the form of small siliceous, chalcedony, and basalt/andesite pebbles. Rocks from outcrops located on the eastern and western Pampas, as well as others from northern Patagonia, were also exploited (Figure 1). The Tandilia and Ventania Sierras in the eastern Pampas, the Meseta del Fresco in the western Pampas, Cerro Huenul in northwestern Patagonia, and Meseta de Somuncura in northern Patagonia, are all places from which



**Figure 1.** Location of the lower course of the Colorado River (grey) relative to neighboring regions. Location of the main archaeological sites per period: Rectangle: Initial Late Holocene; Circle: Final Late Holocene; Triangle: Initial and Final Late Holocene.

lithic raw materials were obtained (see Armentano 2012, 2014; Santos Valero 2015).

Palaeoclimatic information shows that during the Middle Holocene plant communities in different sectors of northeastern Patagonia indicate semi-arid conditions with a low frequency of precipitation and increased temperatures (Schäbitz 2003). Along the Colorado River valley a strong deactivation of the river system was accompanied by an intense morphogenesis under arid conditions ca. 5700 BP (Martínez et al. 2012b). On the north coast of the San Matías Gulf arid climatic conditions developed between 6700 and 3000 BP, and pollen records point to a greater intensity of the Southern Hemisphere's westerly winds (see discussion in Marcos et al. 2014). At the beginning of the Late Holocene (ca. 3000 BP), arid to semi-arid conditions prevailed, although constant rainfall events occurred. This was related to the weakening of the westerlies and to a strong influence of humid air masses from the Atlantic Ocean. A pattern of greater seasonality and frequency of rainfall with lagoon expansions is recorded (Schäbitz 2003). While in the San Matías Gulf area arid pulses are identified ca. 1000–500 BP, in the Colorado River basin buried "A" soil horizons represent periods of landscape stability ca. 1000–400 BP (Marcos et al. 2014; Martínez and Martínez 2011). In the Negro and Colorado Basins evidence from other proxies such as small vertebrates sensitive to climate changes (e.g., *Holochilus brasiliensis*, *Ceratophrys* spp.) suggests warm and humid conditions (Fernandez et al. 2011; Prates 2008; Stoessel et al. 2008). However, these palaeoclimatic proxies are still insufficient to assess whether events related to the Medieval Climatic Anomaly and the Little Ice Age took place in northeastern Patagonia (Martínez et al. 2013).

#### ARCHAEOLOGICAL INDICATORS OF REGIONALIZATION: THE EVIDENCE FROM THE STUDY AREA

Despite the intense geomorphological processes that impacted the archaeological record (Martínez et al. 2013; Martínez

and Martínez 2011) sites in the lower course of the Colorado River have been recorded between ca. 5900 and 250 BP, although most archaeological sites are concentrated in the Late Holocene. Important organizational changes in hunter-gatherer societies were detected between the Initial Late Holocene (ca. 3000–1000 BP) and the Final Late Holocene (ca. 1000–250 BP). In this section, we present different lines of evidence and archaeological indicators for discussing the process of social reorganization. Some of the consequences and archaeological expectations of regionalization mentioned in the introduction are discussed. Due to space constraints not all the available data can be presented in this work and can be consulted in previously published papers (see references along the text). We, therefore, emphasize those lines of evidence considered stronger and more sensitive for discussing the issue (mortuary practices, lithic raw material provenience, and designs on portable items).

One process that needs to be considered when dealing with regionalization is that of population growth. Considering northeastern Patagonia, the probabilistic distribution of radiocarbon dates shows an increased archaeological signal towards the last 1000 years BP (Favier Dubois 2013; Martínez et al. 2013). We interpret this as the result of an increasing population that provided the scenario for the operation of a variety of density-dependent factors that produced an effective occupation of the regional landscape (*sensu* Borrero 1994–1995). The other evidence takes the form of an increase in the number of sites, a more stable system, and the re-use of places through time. During the Final Late Holocene, archaeological sites are more abundant and several lines of evidence suggest a greater intensity in site occupation. While Initial Late Holocene sites, such as La Primavera (ca. 2900–2700 BP) and Loma Ruiz 1 (ca. 1900–1600 BP) show more limited radiocarbon age ranges and evidence of relatively short-lived use, others of Final Late Holocene age, like La Petrona (ca. 800–250 BP) and El Tigre (ca. 900–400 BP; see Figure 1), indicate longer periods of occupation with repeated use of the same



**Figure 2.** A) Stratigraphic spatial relation between grinding materials and human burials at Zoko Andi 1; B) Formal disposal area at Paso Alsina.

places of landscape (Flensburg et al. 2011; Martínez 2008–2009). This is also supported by the artifact densities recorded per site, both in superficial and in stratigraphic contexts, which are larger towards the Final Late Holocene (Martínez 2008–2009). Larger and well-demarcated base camps with formal furniture artifacts (mortars) are also noticeable for this period (e.g., Zoko Andi 1; Figure 2A). Along with this, ca. 1000–800 BP we find evidence of systematic and repeated coastal occupation (e.g., at the San Antonio archaeological locality; Figure 1). Recurrent occupation of some places is also indicated by the funerary record. In some sites (e.g., La Petrona) primary burials are incomplete as a consequence of the prehistoric recovery of bones for making funerary bundles as part of secondary burial practices. Secondary burials were dated at La Petrona between ca. 800 and 250 BP, indicating reuse of the same place in the landscape over some 500 years (Martínez et al. 2012a). Intra- and inter-site variability has also been observed in the settlements of this period (Martínez 2008–2009).

Regarding mobility, some of the evidence mentioned above (and see also our discussion of lithic artifacts below) indicates a reduction in the residential component of mobility (*sensu* Binford 1980). Moreover, the handling of corpses and the funerary rituals from this period, which are represented archaeologically by formal disposal areas (Figure 2B) (see below), also indicate a logistical component of mobility. A very complex system of mobility triggered by economic and ritual factors can thus be inferred for the Final Late Holocene (Martínez et al. 2012a).

Subsistence also underwent important changes through the Late Holocene. At Initial Late Holocene sites few species were exploited, predominately ungulates (guanaco—*Lama guanicoe*—and pampayan deer—*Ozotoceros bezoarticus*) and large-sized birds (ñandú—*Rhea americana*). During the Final Late Holocene, although these species continued to be exploited, a greater frequency and diversity of smaller sized species was consumed, including medium and small-sized birds, marine and freshwater fishes, rodents and armadillos. (Alcaráz 2015;

Stoessel 2014). The high variety of freshwater and marine fish exploited is also remarkable (Table 1). Fragmentation and fracture patterns on ungulate bone assemblages indicate that in sites belonging to the Final Late Holocene marrow processing for consumption was more intense than in the former period (Stoessel 2014). Consistent with this, stable isotope analysis of human remains indicates a diet based on consuming protein from the meat of terrestrial herbivores (e.g., artiodactyls) complemented by fish (Martínez et al. 2009). The same trends were observed through studies of fatty acids in pottery sherds (Stoessel et al. 2015). Caries were only recorded in individuals of the Final Late Holocene (5.2%) when an increase in the frequency of dental calculus is also observed, indicating a higher intake of carbohydrates during this period (Flensburg 2011a). In short, the evidence supports the proposal of dietary diversification and a process of intensification in resource exploitation during the Final Late Holocene (Stoessel and Martínez 2014). Clearly for this period plant and aquatic resources played an important role in subsistence compared with the former period, consistent with reduced mobility and increased population density (Binford 2001), thus reinforcing the points made above.

Changes in technology are also observed, some of which are related to the modifications already mentioned for subsistence. Pottery is first recorded in the study area ca. 1900–1600 BP, although its use became much more frequent and systematic ca. 900–250 BP. The lithic assemblages recovered for the Final Late Holocene (ca. 1000–250 BP) show longer and more complex *chaîne opératoires* and more standardized tool assemblages compared with those from the Initial Late Holocene (Armentano 2012, 2014; Santos Valero 2015). Bifacial techniques and heat treatment for improving raw material quality also increase, and specialization in tool production (e.g., for projectile points) has been proposed (Armentano 2012). Evidence for curation, the retention of artifacts as site furniture and provisional place strategies is strong. Issues related to lithic raw material exploitation are considered later. To sum up, the Final Late Holocene saw people

**Table 1. Exploited taxa (NISP and NISP%) in initial and final Late Holocene sites considered in this article. Initial Late Holocene sites: La Primavera and Loma Ruiz 1 (Stoessel 2012). Final Late Holocene sites: El Tigre and San Antonio (Alcaráz 2015; Stoessel and Alcaráz 2015; Stoessel 2012).**

Taxa	Initial Late Holocene (3000–1000 years C <sup>14</sup> BP)				Final Late Holocene (1000–250 years C <sup>14</sup> BP)			
	La Primavera		Loma Ruíz 1		San Antonio		El Tigre	
	NISP	NISP%	NISP	NISP%	NISP	NISP%	NISP	NISP%
Ungulates								
<i>Lama guanicoe</i> (guanaco)	68 CM/F/TA	79,07	55 F/TA	100	37 F/TA	1,10	614 CM/F/TA	28,16
<i>Ozotoceros</i> <i>bezoarticus</i> (pampean deer)	10 F	11,63	—	—	—	—	—	—
Large-sized birds								
<i>Rhea americana</i> (ñandú)	8 F	9,30	—	—	—	—	—	—
Medium-sized birds								
Anatidae indet.	—	—	—	—	—	—	2CM	0,09
<i>Theristicus</i> sp. (ibis)	—	—	—	—	—	—	1CM/TA	0,04
<i>Larus</i> sp. (gull)	—	—	—	—	—	—	2 CM	0,09
<i>Nycticorax</i> <i>nycticorax</i> (black- crowned night heron)	—	—	—	—	—	—	1 CM	0,04
Small-sized birds								
<i>Pitangus</i> <i>sulphuratus</i> (great kiskadee)	—	—	—	—	—	—	1 CM	0,04
Marine fishes								
<i>Genidens</i> <i>barbus</i> (sea catfish)	—	—	—	—	2743 CM/TA	81,44	—	—
<i>Micropogonias</i> <i>furnieri</i> (white croaker)	—	—	—	—	254 TA	7,54	—	—
<i>Myliobatis</i> sp. (eagle ray)	—	—	—	—	25 TA	0,74	—	—

(Continued on next page)

**Table 1. Exploited taxa (NISP and NISP%) in initial and final Late Holocene sites considered in this article. Initial Late Holocene sites: La Primavera and Loma Ruiz 1 (Stoessel 2012). Final Late Holocene sites: El Tigre and San Antonio (Alcaráz 2015; Stoessel and Alcaráz 2015; Stoessel 2012). (Continued)**

Taxa	Initial Late Holocene (3000–1000 years C <sup>14</sup> BP)				Final Late Holocene (1000–250 years C <sup>14</sup> BP)			
	La Primavera		Loma Ruiz 1		San Antonio		El Tigre	
	NISP	NISP%	NISP	NISP%	NISP	NISP%	NISP	NISP%
Chondrichthyes	—	—	—	—	29 TA	0,86	—	—
Sciaenidae indet.	—	—	—	—	75	2,23	—	—
					CM/TA			
Freshwater fishes								
<i>Percichthys sp.</i> (perch)	—	—	—	—	205 TA	6,09	1359	62,33
Medium-sized rodents								
<i>Lagostomus maximus</i> (plains vizcacha)	—	—	—	—	—	—	16 CM	0,73
<i>Myocastor coypus</i> (coypus)	—	—	—	—	—	—	6 CM	0,27
Small-sized rodents								
Small-sized caviomorph	—	—	—	—	—	—	122	5,59
<i>Holochilus brasiliensis</i> (web-footed marsh rat)	—	—	—	—	—	—	26 CM	1,19
Armadillos								
<i>Chaetopbractus villosus</i> (armadillo)	—	—	—	—	—	—	30	1,37
							CM/TA	
Total	86	100	55	100	3368	100	2180	100
Ntaxa	3		1		7		12	

Note: CM: cut marks; F: fractures; TA: thermal alteration.

reorganize their lithic technology according to different production objectives and technological strategies (Armentano 2012, 2014; Santos Valero 2015).

We consider information related to the social differentiation and construction of regional identities to be a key issue for defining regionalization. In this vein, three additional lines of evidence generated at the study

area are more sensitive for further understanding the process, namely (1) increased ritual, burial modalities, and violence; (2) lithic raw material provenience, circulation, and use; and (3) decoration on portable items. We discuss each of these in turn.

### Increased Ritual, Changes in Burial Modalities, and Violence

The bioarchaeological record of the lower course of the Colorado River shows significant variability throughout the Late Holocene. Primary burials are found during the entire period, secondary burials begin to appear ca. 1400 BP, and formal inhumation areas are first detected ca. 500 BP (Martínez et al. 2012a). Cemeteries such as Paso Alsina 1 (Figure 1) show 10 multiple secondary burials simultaneously deposited in a small area (6 m<sup>2</sup>) (Figure 2B). A minimum of 77 individuals of both sexes and all ages has been recorded (Flensburg et al. 2015). Red coloring, as well as evidence of defleshing, cutting, and scraping on bone surfaces, indicates significant manipulation of corpses. An intensively scheduled mortuary ritual took place during the Final Late Holocene. On a regional scale a similar trend in the handling of bodies and the making of bundles (e.g., distribution of bone elements) is observed from ca. 1200 BP in the western and southeastern Pampas and the southern portion of northeastern Patagonia, among other regions (see Berón 2012; Martínez et al. 2012a; Prates and Di Prado 2013 and references therein). The appearance of formal inhumation areas during the last 1000 years BP indicates a clear delimitation of certain parts of the landscape for ceremonial and sacred purposes with important implications for territorial demarcation (see discussion in Berón 2012; Curtoni and Berón 2011; Martínez et al. 2012a). In this sense, rituals became more complex and acquired greater symbolic efficacy in controlling space (Insoll 2004). Mortuary rituals and the handling of human remains significantly influence the development and maintenance of identities, and the strengthening of social relationships and collective social memory, but they also indicate changes in relationships with “others”, suggesting mechanisms

of social differentiation (Chénier 2009; Shaffer 2005) that can be interpreted in terms of regionalization.

For northeastern Patagonia, with the exception of the post-contact period, evidence of conflicts and interpersonal violence is scarce (Flensburg 2011b; Gordon 2013). In this sense, changes as part of the process of social reorganization during the Final Late Holocene do not appear to have led to increased violence or conflict. If social tensions existed, people presumably resolved them through other mechanisms, such as population movements, mechanisms of group fusion and fission, and alliances for obtaining goods and partners (Flensburg 2011b; Gordon 2013). As stated elsewhere (Gordón 2013), the lower course of the Colorado River functioned as a soft border, with permeable territories inhabited and negotiated by various human groups (see also Martínez 2008–2009). On the contrary, for the western Pampas a scenario of important conflicts has been proposed with some evidence of interpersonal violence present ca. 1000–700 BP. For this same time,  $\delta^{18}\text{O}$  results and associated material culture from two individuals with evidence of violence from the Chenque 1 site indicates that these people came from the western side of the Andes (Berón et al. 2013). Afterwards, severe conflict is evident, accentuating toward 400 BP when wars involving special social formations such as castes of warriors may have developed (Berón 2012). In this sense, a scenario of greater violence in the southwestern Pampas at the very end of the Final Late Holocene seems to be more related to the presence or intervention of groups of western (Araucanian) origin. As proposed, in northeastern Patagonia conflict levels were lower and, possibly, interactions with western populations were not very fluent for this moment. These different scenarios of violence may indicate different kinds of relationships between groups from the west and east of the Pampas and northern Patagonia. It has been proposed that the presence of burials with clear indicators of conflict could be a response to dynamics related to the social reproduction, redefinition, and reconstruction of identities during the

**Table 2.** Frequency of local and exotic lithic raw materials in the lower course of the Colorado River. Initial Late Holocene: El Puma 3, Campo Monaldi, Caldén Guazú-Médano 1 SE, Loma Ruíz, El Caldén, Voladero Tulli and La Primavera sites (Armentano 2012; Santos Valero 2014, 2015). Final Late Holocene: EL Tigre, San Antonio, Zoko Andi 1 and La Salada sites (Armentano 2012; Martínez et al. 2014; Santos Valero and Armentano 2013).

Geographic source	Raw materials	Initial Late Holocene	Final Late Holocene
Local/areal rocks	Siliceous rocks	21.96	50.76
	Basalt/andesite	19.27	2.71
	Chalcedony	20.86	31.36
	Dacite	4.62	1.91
	Tufite	5.22	2.74
	Undifferentiated rock	3.39	4.88
	Rhyolite	3.27	0.65
	Other	6.47	1.57
Eastern Pampa	Quartz sandstone	1.91	0.02
	Metaquartzite	4.09	0.32
	Orthoquartzite	4.84	0
	Undetermined. quartzite	1.22	0.23
	Siltstone	0.69	0.02
	Granite	0.04	0
Western Pampa	Siliceous chert	0.06	0.21
Central North Patagonia	Translucid chaledony	0.34	2.42
	Brown silica	0.04	0.03
Western Patagonia	Obsidian	0.28	0.11
	Possible obsidian	1.43	0.06
	Total	100	100

Late Holocene in the broader macro-region (Berón 2012:107). These processes would have demarcated frontiers, indicating regionalization through social differentiation between these sectors.

### Lithic Raw Material Provenience, Circulation, and Use of Rocks

The organization of lithic technology underwent several changes between the two periods of the Late Holocene. During the Initial Late Holocene about 86% of the exploited rocks were local or areal in origin

(Table 2). The rest (ca. 14%) came from regions to the north (e.g., quartzites from the Ventania and Tandilia Sierras), west (e.g., obsidian from Cerro Huenul and siliceous chert from Meseta del Fresco), and south (e.g., translucent chalcedony and brown silica from Meseta de Somuncurá) of the study area (Table 2, Figures 3 and 4; Armentano 2012, 2014; Santos Valero 2015). Towards the Final Late Holocene local/areal raw materials were much more extensively used and rocks coming from surrounding regions diminished to just 3% of the total. In this sense, although percentages of siliceous chert and obsidian

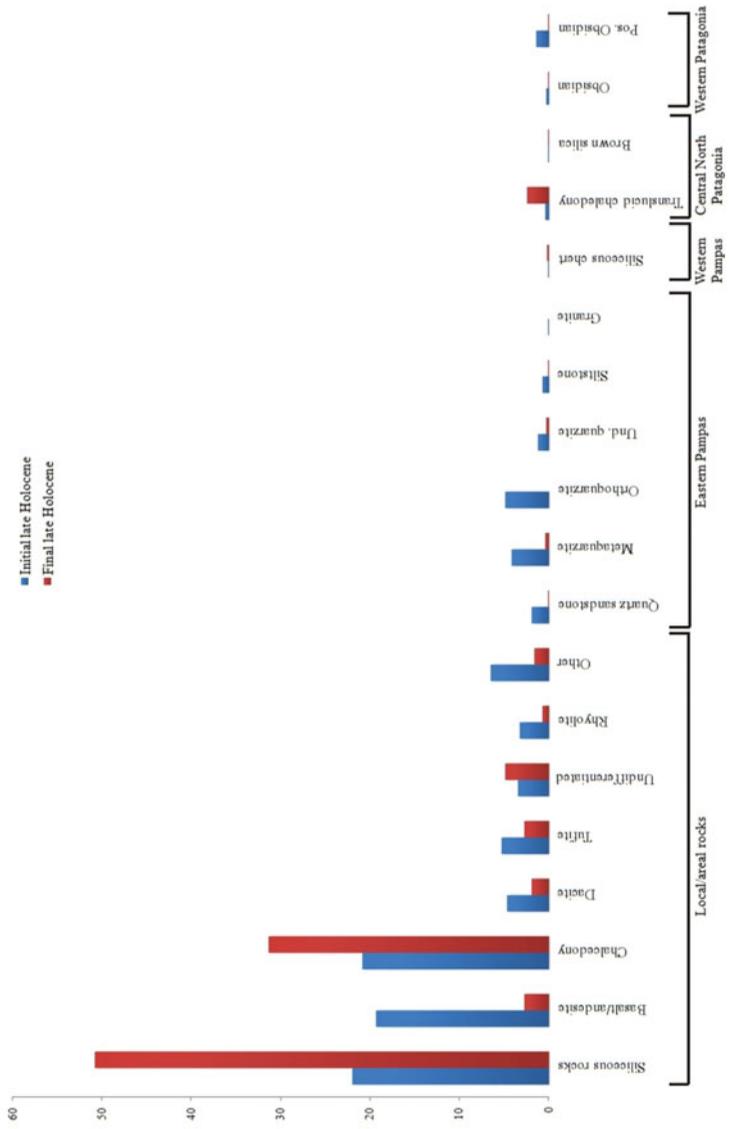
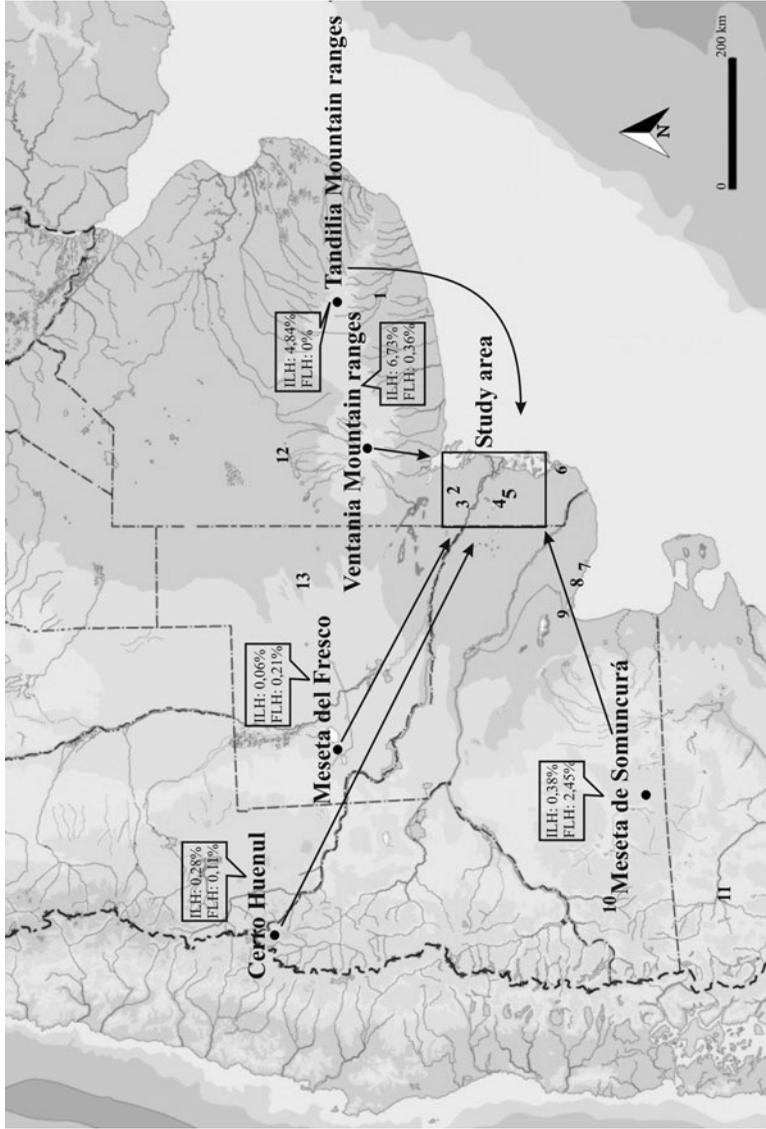
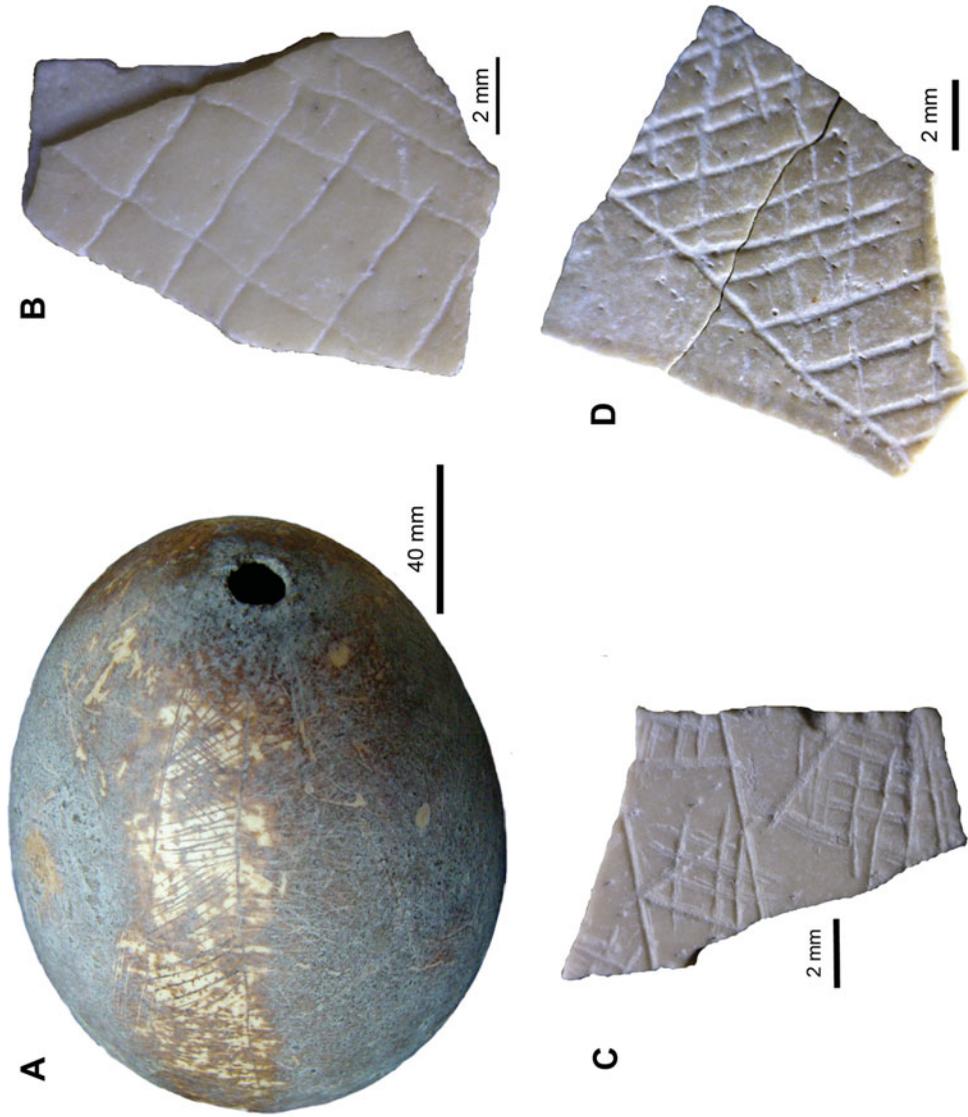


Figure 3. Comparative chart showing the frequencies of local, areal, and exotic lithic raw materials by period.



**Figure 4.** Frequencies of exotic raw materials through the Late Holocene and outcrops distribution; ILH: Initial Late Holocene, FLH: Final Late Holocene. Spatial distribution of engraved Rheiidae eggs. Numbers indicate sites with decorated eggshell fragments: 1) Paso Otero 4; 2) El Caldén; 3) El Puma 3; 4) La Modesta; 5) Loma de los Morteros; 6) La Serranita; 7) Bajo de la Quinta; 8) Bahía Final 10; 9) San Antonio Oeste; 10) Casa de Piedra de Ortega; 11) Campo Cerdá; 12) Pintado 2; 13) Laguna del Fondo.



**Figure 5.** Engraved designs on *Rheidae* eggs and eggshell fragments. A) Cross-hatched band on a complete egg from Pintado 2; B) Cross-hatched band fragment from Pintado 2; C) Triangular design from Loma de los Morteros site; D) Infilled motif (band or rectilinear figure) from Loma de los Morteros site.

coming from the west remain similar, there is a noticeable increase in the translucent chalcedony record. On the other side, the frequencies of quartzite rocks coming from Ventania decrease considerably, while those from Tandilia are absent (Table 2; Figures 3 and 4). This changing scenario probably reflects more extended and frequent contacts with groups from the south, with correspondingly diminished relations with people further north (Armentano 2014; Santos Valero 2015). This last phenomenon could, in turn, relate to the control of quarries proposed for the Pampean region (Bayón and Flegenheimer 2004; see also Armentano 2012, 2014). In other words, it would indicate more formalized relations of exchange and the definition of territories where access to lithic resources from neighboring regions was socially regulated. One consequence of this is likely to have been relatively small territories and restrictions in the action ranges of groups. Further evidence suggesting regionalization processes in northern Patagonia is given by the clearly bounded spatial distribution of different styles of projectile points. Prates (2008) observes a marked change between the southern and northern portions of the Limay-Negro basins (Figure 1) after ca. 1000 BP concerning the designs of projectile points. Non-stemmed and small-sized projectile points are most abundant north of these basins, while the highest frequencies of stemmed projectile points are observed to their south. Since these patterns cannot be explained by technological considerations (e.g., the availability of specific types of rocks), he argues that this difference may reflect processes of identity display (Prates 2008:256–257). This situation would indicate the existence of relatively more closed social systems with respect to certain portions of the neighboring regions, such as the eastern Pampas and northeastern Patagonia, as part of overall regionalization processes.

### **Decorated Portable Items**

Portable art from the lower course of the Colorado River is represented by decorated fragments of eggshell belonging to South

America's flightless birds (Rheidae), pottery, mollusc shells, and bones. Our discussion focuses on the analysis of the engraved Rheidae eggshells, which are the most frequently decorated items in the area and are interpreted as parts of water flasks (Carden and Martínez 2014; Hitchcock 2012). During the Middle and Initial Late Holocene (ca. 5900–1000 BP) Rheidae eggs were decorated with geometric rectilinear motifs consisting of lines (simple, parallel, irregular, and crosshatched), figures (mainly triangles and rectangles), and bands containing linear elements (Figure 5). These fragmentary designs are repeated on a macro-regional scale, including the eastern and western portions of the Pampas and northern Patagonia (Figures 4 and 5) (see Carden and Martínez 2014 and references therein). The wide circulation of designs on Rheidae eggs in the study area during the Initial Late Holocene is congruent with the distribution of rocks previously discussed and suggests that style may have reinforced a scenario of relatively open social networks where objects, raw materials, and images moved fluidly across long distances (Gamble 1982). With the exception of two sites in northwestern Patagonia (Casa de Piedra de Ortega and Campo Cerdá; Fernández and Ramos 2008; Belelli personal communication 2014), no decorated eggshells have been registered in the rest of the Patagonian and Pampean region after 1000 BP. The more restricted distribution of decorated eggshell fragments could imply less fluid contacts with neighboring groups, which suggests that relatively open social networks decreased during the Final Late Holocene. It is also possible that a new system of symbols replaced the former means of communication, whether through different supports or new images. These data suggest that after 1000 BP more relatively closed social networks, and probably a greater degree of regionalization, were operating.

### **CONCLUSIONS**

In the Pampean and North Patagonian macro-region of Argentina processes of intensification in social networks, social complemen-

tarity, and exchange among groups of neighboring areas and regions have been proposed for the Final Late Holocene (Barrientos and Perez 2004; Berón 2012; Bonomo 2006; Curtioni 2006; Martínez 2008–2009; Martínez and Mackie 2003–2004; Mazzanti 2006; Politis 2008). Considering this scenario, the trends presented here regarding changes in settlement systems, mobility, subsistence, and technology are in line with those expected from processes that comprise density-dependent factors based on increasing population. The state of the art of palaeoclimatic reconstructions for northeastern Patagonia is not sufficient to determine if severe climatic events such as the Medieval Climatic Anomaly and the Little Ice Age played a role in hunter-gatherer adaptations and impacted the organization of human populations (Martínez et al. 2013). Nevertheless, the environments of northeastern Patagonia are distinctive because, despite being arid to semi-arid, they are ecotones close to the Atlantic Ocean crossed by allochthonous rivers that offer important sources of resource diversity and biological productivity. Following this reasoning, a logical consequence for more productive environments in a scenario of increased population is enhanced territoriality and possibly spatial circumscription and demographic packing (Binford 2001). Nevertheless, enhanced territoriality is not itself enough to propose a scenario of regionalization. When analyzing evidence related to increased ritual, funerary practices, and spatio-temporal patterns in the circulation of rocks and images, the existence of a regionalization process can be proposed, where the increase of territoriality cannot only be explained by density-dependent factors and environmental productivity. In this case, the increase of relatively closed social networks, particularly ca. 500 BP, would have been based on intense and competitive social relationships, identity issues, and social differentiation (Barberena 2013; Berón 2012; Mazzanti 2006; Politis 2008). Evidence of the kind presented here suggests the existence of these processes. The new territorial structure triggered by the regionalization of social behavior included a very well articulated set of territorial protocols that undoubtedly influ-

enced mobility systems and coverage of the landscape. A greater demography combined with the access to smaller territories surely needed safe social regulations that permitted access to other people and resources as part of an inclusive system. The more frequent use of local raw materials and the decrease or absence of exotic rocks from neighboring regions indicates changes in the intensity and fluidity of contacts. The disappearance of visual communication systems on certain objects such as Rheididae eggs also indicates at least a restriction and/or a lack of fluidity between these sectors. Formal inhumation areas indicate both a sense of belonging and the construction of territorial markers. Based on these arguments and on the evidence from the study area, a regionalization process can therefore be proposed for northeastern Patagonia as part of a wider macro-regional process that included other portions of Patagonia and the Pampas.

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