

We are IntechOpen, the world's leading publisher of Open Access books Built by scientists, for scientists

4,800

Open access books available

123,000

International authors and editors

135M

Downloads

Our authors are among the

154

Countries delivered to

TOP 1%

most cited scientists

12.2%

Contributors from top 500 universities



WEB OF SCIENCE™

Selection of our books indexed in the Book Citation Index
in Web of Science™ Core Collection (BKCI)

Interested in publishing with us?
Contact book.department@intechopen.com

Numbers displayed above are based on latest data collected.
For more information visit www.intechopen.com



Chapter

Sociocultural Interaction and Symbolism in Prehistoric South America: Quartz Crystal Manuports from Tierra del Fuego

*María Estela Mansur, Hernán Horacio De Angelis,
Vanessa Esther Parmigiani, María Celina Alvarez Soncini
and Anna Franch Bach*

Abstract

The use of mineral elements with special characteristics, such as quartz crystals, in ornamental or ceremonial contexts, is not uncommon in archaeology. Their appearance in different archaeological sites is the basis to discuss their significance for past societies. However, while these objects are loaded with symbolic value, it is difficult to identify them in hunter-gatherer sites. In this chapter, we discuss this subject from the case of a series of crystals discovered in the central area of the Big Island of Tierra del Fuego, and we outline their interpretation based on technofunctional analysis confronted with the ethnographic information for the region. Tierra del Fuego is located at the southern tip of South America. It was inhabited by hunter-gatherer societies since the end of last glaciation until the beginning of the twentieth century. In historical times, the central-northern sector of the Big Island was occupied by the Selknam society, in which there is an extensive ethnographic and ethnohistorical bibliography. Archaeological research in the central area of Tierra del Fuego has revealed a continuous occupation of hunter-gatherer societies. The analysis of provenience of raw materials lets us to propose hypothesis about mobility and interaction networks that can be confronted with the ethnographic information.

Keywords: interaction networks, ornaments, ceremonial, technofunctional analysis, raw materials

1. Introduction

Tierra del Fuego is located at the extreme south of South America. The archipelago is formed by a large island, the Big Island of Tierra del Fuego, and a series of smaller ones extending to the south up to Cape Horn. From there, the Nassau Strait separates the southern tip of the American continent from the top of Antarctic Peninsula. Politically, the archipelago is divided between two countries, Chile and Argentina (i.e., in [1–10]).

The Big Island is separated from the continent, to the north and west, by the Magellan Strait. However, by the end of last glaciation, low sea levels converted the island in a peninsula of Southern Patagonia and gave one of the windows of opportunity for the peopling of Tierra del Fuego. During that short time, pedestrian hunter-gatherer populations arrived from Northern Patagonia via this existing land connection (i.e., in [11–14]). Their older remains have been dated from 11.000 BP. Shortly later, canoe hunter-gatherers from Southern Chile colonized the islands, sailing along the Pacific southern coast. Their older remains in the Big Island Beagle Channel coasts date from 9.000 BP (i.e., in [15, 16]) (**Figure 1**).

Thereafter, hunter-gatherer societies spread all over the Big Island and the archipelagos, keeping these two different ways of life. One of them extended in almost all the Island; it was oriented to exploitation of inland resources, especially hunting of the biggest mammal in Tierra del Fuego, the *guanaco* (*Lama glama guanicoe*), as well as rodents, that was complemented by collection of a wide variety of plant products, eggs, and occasional fishing and shellfish collection near the coast. The other one developed on the southern coast of the Big Island as well as in the archipelagos extending to the south. It was adapted to sea mammal hunting, especially sea otters (*Otaria flavescens* and *Arctocephalus australis*), as well as to exploitation of coastal resources including all types of shellfish, maritime birds, and plant resources from the forest. These two different ways of life of hunter-gatherer populations persisted in Tierra del Fuego until the early twentieth century.

A long tradition of ethnographic and archeological studies produced a detailed corpus of information about the occupation dynamics of large portions of the island by these societies, their ways of life, and the characteristics of biotic and abiotic resource management strategies (i.e., in [1–6, 11, 13, 15, 17–22]).

Our research concerns specifically the central mountains region of the Big Island, within the frame of an ethnoarchaeological project called “Proyecto Arqueológico Corazón de la Isla” (PACI) that started in the late 80s and early 90s. This region, according to the reports written by the travelers arrived to Tierra del Fuego during the nineteenth century, was inhabited by the Selknam, a nomad hunter-gatherer society who exploited a wide range of biotic and abiotic resources



Figure 1.
Geographic location of the study area and archeological sites.

that were used for subsistence goods (food, medicine), as well as sociocultural (shelter, clothing, technology, ornament, ceremonies, etc.).

Anthropologist A. Chapman registered different modes of interaction that allowed the maintenance of the hunter-gatherer way of life, until the arrival of the Europeans. The most important were different aggregation events, in which the ceremonies stand out. As an example, we can mention the initiation ritual of adolescent males, the Hain ceremony. While this ritual has as an essential objective the consolidation and maintenance of social order, it is also true that it is an opportunity to meet relatives or friends, coming from different territories, who gather and camp together for months. These events were ideal occasions for carrying out exchanges and transactions (i.e., in [4]).

Within the scope of our archeological project, evaluations and systematic surveys were carried out in several sectors that allowed evaluating the intensity of human occupation and locating archeological sites in different environments and microenvironments within the mountain landscape. The results of these investigations show evidence of different types of archeological sites. On one hand, there are small archeological sites with diffuse combustion structures, poor conservation of bone remains, and reduced lithic registry, attributed to short occupations of small and mobile family groups. On the other, there are large extensive sites with abundant archeological material and evidence of different activities considered as multiple task base camps, as Kami and Ewan (i.e., in Refs. [6, 7, 9, 18, 23, 24]).

The archeological site Kami is formed by horizontal palimpsests caused by successive reoccupations, at least over the last 1000 years approximately (i.e., in [7, 19, 24–28]). It is located on the southern coast of Fagnano Lake, the largest lake in the Big Island, cutting the relief in two parts, north and south of Fagnano (**Figure 1**). On the other hand, Ewan is a very special site, with only one occupation. It is formed by two sectors. In one of them, there is still visible part of the structure of a log hut, thus indicating its recent chronology (Ewan 1). The other sector (Ewan 2), apart around 200 mts from the first one, has no aerial structure conserved. It was identified by systematic survey, where we could locate four more structures, smaller than that of Ewan I. Excavations and analysis in both sectors let us confirm that Ewan I was a ceremonial hut. The whole site's settlement pattern as well as the characteristics of materials and distributions recorded correspond to those described for the Hain ceremony (i.e., in Refs. [3–5]). This ceremony was held, as dated by dendrochronology and other chronological indicators, in the spring–summer of 1905 (i.e., in [26, 29, 30]).

In recent years, PACI investigations have extended to the eastern and western extremes of this central strip of the Big Island that is to the Atlantic coast to the east and to the west where the international border Argentina-Chile is located. In general, the results obtained allowed the identification of sites near to the Atlantic coast (Cabo San Pablo and Lainez and Irigoyen rivers) and at the western end of the Fagnano Lake (National Park and Torito Bay). The spatial distribution of archeological sites and remains indicates a general occupation of all environments within the subantarctic forest. However, for the different environments, it has been possible to document differences in density and intensity of occupation, as well as differences in raw materials used, as revealed by technofunctional analysis. These variations are related to the mobility of hunter-gatherer groups, due to the accessibility, availability, and/or seasonal abundance of resources (i.e., in Refs. [7, 24, 27, 28, 31–33]).

We believe that these differences are good indicators to study mobility of hunter-gatherer groups around the whole territory. Currently we are investigating social interaction networks from the archeological point of view, from the determination of nodes and internodal spaces (i.e., in [34, 35]), taking as a basis

the circulation of raw materials and ornaments (i.e., in [10, 36]). However, there are elements that we cannot explain from the point of view of circulation of raw materials, because they are really exceptional in archeological contexts and also because they have not been manufactured or used.

If we consider these elements as manuports, we can analyze the possibility of circulation as ornamental pieces loaded with symbolic value within social interaction networks. From this point of view, we present and discuss the case of a series of nine prismatic quartz crystals that were discovered in one of the sites. This is something really unusual for the archeological record of Tierra del Fuego. The technofunctional analysis revealed that they have neither been manufactured nor used. Their provenience source is far from the site, and the primary sources of this raw material have not yet been identified.

Different scenarios can be proposed to explain their presence here; however, the most probable interpretation is that they have arrived as a “gift” between relatives in one of the social interaction networks. Because of their attractiveness, color, rarity, and difficulty to be found, they are likely to be included in exchange activities, reinforcing connections, like the Hain ceremony. Since the works of Marcel Mauss, especially the publication of the essay *The Gift* (i.e., in [37]), the concepts of “gift” and “counter-gift” start to be used to understand the economic logics in primitive societies. For Mauss, “gift” and “counter-gift” constitute the basis of reciprocity. They are not a simple exchange; they give prestige and importance to the donor. Then, Lévi-Strauss gives a clear dimension to reciprocity in relation to kinship relations and alliances. He considers that in primitive societies, the reason for gifts is to create alliances. In the type of exchange where there is a gift and a counter-gift, there is much more in the exchange than the exchanged objects themselves (i.e., in [38]). In this case, we understand as a gift the exchange of particular objects (with ornamental or symbolic value) that have as purpose to strengthen the relations between groups during and after aggregation events, as the Hain ceremony.

We believe that the models extracted from ethnographic and ethnohistoric information, which we utilize to explain this perspective on strategies implemented by Fuegian hunter-gatherer societies, are an excellent starting point to approach the interpretation of different aspects of Paleolithic hunter-gatherer strategies. Consequently, it would be interesting to explore them in relation with different findings of quartz crystals in archeological contexts in other parts of the world.

2. Quartz as raw material

Quartz is a common raw material on earth that occurs in different states, such as milky quartz or as hyaline quartz (rock crystal). Due to this availability, it was a raw material highly used in prehistory, mainly milky quartz. This archeological abundance does not occur in the same way for hyaline quartz crystals; however, they have been used as raw materials for lithic assemblages in certain regions as central Brazil, South Africa, Russia, Greece, and Portugal (i.e., in Refs. [39–44]). On the other hand, this material has been interpreted with functions associated with the symbolic, votive aspect, as part of funeral garments, in megalithic constructions, or used by the shamans for their possible magical powers (i.e., e.g., [45–49]). There are ethnographic works that account for the use of quartz by shamans and their magical-symbolic function (i.e., [50–52]). However, as mentioned by Fenandez-Machena and Ollé (i.e., [53]), these attributions are difficult to prove with materials from archaeological contexts.

In the case of quartz crystal prisms, with little or no modification, something similar occurs; they are not represented in a large number of archeological sites. Some examples are the quartz prisms found within the megalithic complex of Palace III, in the Almadén de la Plata, Seville. The complex consists three different funeral structures in type and temporality. It is a Dolmen in Gallery, a monument of the Tholos type of the Copper Age, and finally a cremation burial mound of the Iron Age. There, quartz elements of different aspects such as pebbles and sheets were recovered, but the most striking were the quartz prisms. In addition, other quartz prisms associated with other dolmen have been found in Spain such as Navalcán (Toledo) (i.e., in [54]) or the single crystal of Alberite (Cádiz) which is 20 cm long (i.e., in [55]). Another case with the presence of prisms of quartz crystals is the Dembeni site, on Mayotte Island in East Africa, dated between the ninth and twelfth centuries. These crystals are not native to the island but possibly come from Madagascar. The authors suggest that it would be a material transported as part of regional trade at short and long distance; this data is in turn supported by ethnohistoric information (i.e., in [56]). Finally, in Paleolithic sites associated with hunter-gatherer societies, some quartz crystal prisms without modification have been identified, in Europe, India, the Near East, and China (i.e., in [57]).

Specifically, in the Great Island of Tierra del Fuego, quartz is a raw material that is widely distributed. Its ubiquity, accessibility, and effectiveness to make usable edges can explain its presence in several archeological sites on the island.

Generally, it is milky quartz that appears in the landscape like a boulder of various sizes (from 3 to 15 cm) or in veins within the Yaghan Formation (of the lower Cretaceous) (i.e., in [58]). For lithic production activity, it can be exploited using various knapping techniques. However, in the region a type of exploitation has been identified that appears on a recurring basis. This is the selection of quartz pebbles that are opened using bipolar percussion technique, which produces elongated flakes or hemi-pebbles. These have been systematically used to make only one type of tool, scrapers (i.e., in [59]). These are small artifacts, whose maximum lengths range between 1.5 and 2.5 cm. With respect to their use, in most of the cases analyzed, they have been used to scrape skins and to a lesser extent for wood and bone, with a kinematics of work transverse to the edge (i.e., e.g., [27, 59, 60]).

As we have written on other occasions, the particularity of the quartz edges is that they have no tendency to round by losing grains—as occurs with other raw materials such as sandstones, rhyolites, or basalts when they are used—but to shear; as a result, they allow longer use and continuous sharp edge, with no need for constant reactivation (i.e., in [61]).

Undoubtedly, this material was specially selected by hunter-gatherers of Tierra del Fuego, as indicated by the recurrence of this raw material in lithic samples of different archeological sites of the island, in particular those of the IV component of Tunel I (i.e., in [59]), Shamakush 1 (i.e., in [60]), Kami 1 (i.e., in [19]), and La Vueltas and La Herradura—although in smaller proportions (i.e., in [62]).

Unlikewise, with respect to the quartz crystals, it is surprising to note that their presence in archeological sites is very low: they have only been registered in Laguna town northwest of Filaret (NOF), in San Sebastián Bay (one fragment), and in Rancho Donata site (two fragments) (Borrazzo, personal communication, 2013) and the cases of our research that we present in this work.

3. Quartz crystals in Tierra del Fuego

During its geological evolution, Tierra del Fuego experienced the necessary conditions for the development of quartz crystals: hydrothermal solutions loaded on silica

and cavities in the rock, where these solutions decompress and deposit dissolved silica. Both during the Jurassic volcanism generated by the Fm Lemaire (which occupies the northern flank of the Sorondo mountain range, the Vinciguerra mountain range, the Valdivieso-Alvear mountain range, Montes Negros, etc. to States Island and to the west in Chile) and then during the regional metamorphism, these conditions could occur together with a moderate temperature of more than 200°C. The first case is more favorable than the second, because there was a higher temperature and wide availability of silica since it is an acid volcanism. Given the extent reached by the geological formations affected by these characteristics (i.e., in [58]), there may be outcrops of this raw material distributed in various parts of the island.

However, as mentioned above, its presence in archeological sites is very low. Therefore, it is interesting to mention the case of those we discovered the investigations in the central strip of Tierra del Fuego.

4. Quartz crystals at the sites of *Corazón de la Isla*

In the central strip of Tierra del Fuego, hyaline quartz materials were recovered at two archeological sites, Kami 7 site and Lainez 1 site.

Kami 7 is an extensive site located on an elevation of till, surrounded by a small pebble beach on the south coast of Lake Fagnano. This area has a thin soil eroded in many sectors, characterized by a mixed evergreen forest of *Nothofagus pumilio* and *Nothofagus betuloides*, and the presence of an extensive *Sphagnum* bog to the east (i.e., in Refs. [19, 28]).

The archeological researches in Kami 7 were made from two methodological strategies: excavation and surface collection. Two excavations were carried out: a large one (K7a) in which a total area of 12.75 m² and another 1 × 1 m (K7b) were excavated to protect material that was at the edge of the road. Finally, the whole area was squared and the surface material recovered following the grid.

In the wide excavation, two combustion areas could be determined, located 1 m away from each other. These areas have important differences between them, as well as in the archeological materials associated with each one. The combustion area no. 1 has an approximate diameter of 60 cm, and its thickness does not exceed 3 cm. The associated archeological materials include coals, bone remains, remains of lithic technology, etc. Within the raw materials represented, there are various types of rhyolites and green industrial glass (flake and microflakes). The presence of glass microflakes in this combustion area implies that this occupation took place after contact with the Europeans (**Table 1**).

The combustion area no. 2 has an approximate diameter of 50 cm, and its thickness did not exceed 2 cm. Coals of various sizes and with a wider dispersion than in combustion area no. 1 were recovered. It was obtained by analysis of AMS, on a sample of charcoal, a date of 769–974 cal AD (OxCal V 4.3.2, SHtCal 13, 95.4%) which implies that the site was occupied—so less—also in this antiquity. The lithic sample inside this combustion area is formed by 1757 elements. The majority correspond to remains smaller than 2 cm, followed by numerous flakes and fragments of various sizes, while the finished instruments are very scarce, as well as cores (**Table 2** and **Figure 2**). The raw materials represented are mainly fine- and medium-grain rhyolites, followed by cinerites.

During the excavation, the presence of prismatic crystals of hyaline quartz was recorded. They were scattered over a radius of approximately 4 m. The sample consists of eight crystals with varying degrees of fragmentation, although large, pyramidal, and bipyramidal between 1.5 and 4 cm (**Figure 3**). To date, no sources of supply of this raw material have been detected near the site.

	Type	Chalcedony	Chert	Cinerite	Quartz	Indet.	Lutite	Slate	Riolite	Flint	Glass	Total
Not retouched	Fragment	4		41	2	13	4	4	90	1		159
	Flake	6		58		5	2		74	2	1	148
	Core	2		3					30			35
	Percutor					3			1			4
	Bipolar Fragm.		1							1		2
	Bipolar core					1				1		2
	small flake	1	2	39	2	2			14			60
	Debris	1	2	58	2	3			22			88
	Total	14	5	199	6	27	6	4	231	5	1	498

Table 1.
 Not retouched artifacts from the Kami 7 site.

Sites	Size	Technological types	Raw materials										
			Basalt	Slate	Lutite	Quartz	Flint	Chert	Chalcedony	Cinerite	Rhyolite	Undet.	Total
Kami 7	> 2 cm	Bifacial tool									1		1
		Instrument fragment			1				1	2	3		7
		Composite instrument								1			1
		Notch		1									1
		Projectil point preform									1		1
		Bifacial tool fragment									2		2
		Endscraper	1				2	2	1	1	10		17
		Sidescraper	1							3	4		8
	Total retouched	2	1	1	0	2	2	2	10	18		38	
	< 2 cm	Micro endscraper				1				1	1	1	4
Total retouched					1				1	1	1	4	
	Total	2	1	1	1	2	2	2	11	19	1	42	

Table 2.
 Retouched artifacts from the Kami 7 site.



Figure 2.
 Kami 7 archeological site excavation plant.

To carry out the techno-morphological study, we treated the crystals surfaces with ammonium chloride powder in order to avoid translucency that impeded examination (Figure 4). The crystals generally have a faceted structure that even



Figure 3.
Quartz crystal from the Kami 7 site, natural surface.

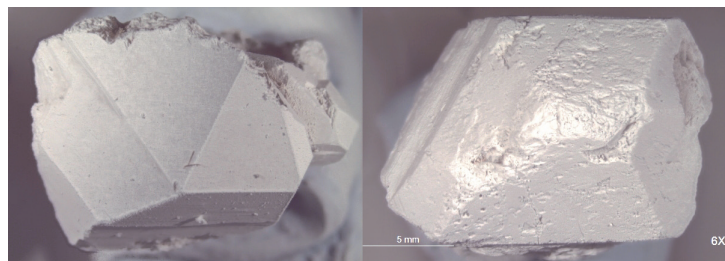


Figure 4.
Quartz crystals from with bleaching process for techno-morphological analysis.

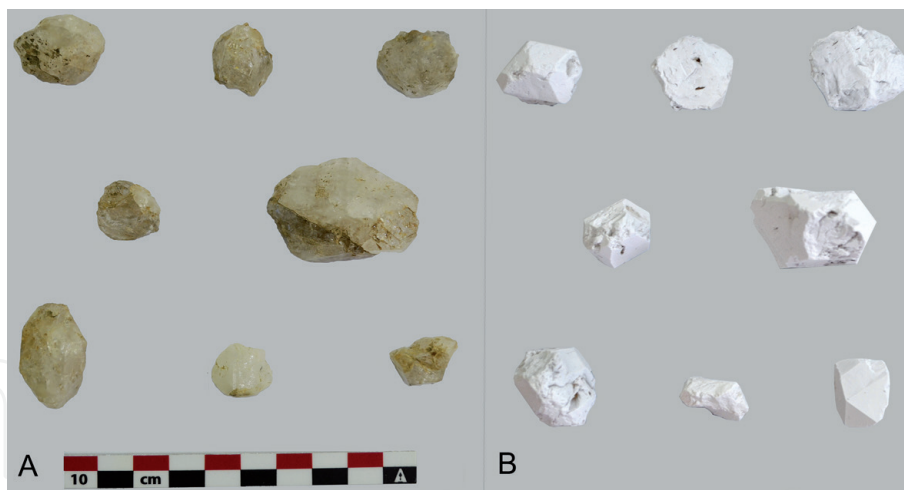


Figure 5.
Totality of quartz crystals from the Kami 7 site. A. Crystals with natural surfaces. B. Crystals with bleaching process.

some of them extend on the pyramidal end (**Figure 5**). Although they are not 100% complete, we could determine that they do not present technological modifications that can be attributed to manufacture (débitage, knapping, etc.), nor do they present extractions of flakes by bipolar technique, so they can be considered as manuports. Only one of them, the largest, has a possible flake scar.

The microscopic-based functional analysis developed on the natural edges present in the prisms ($n = 4$) did not reveal traces of use. It is worth mentioning that three of the edges belong to the same piece. However, the analysis allowed us to recognize postdepositional alterations such as patinas and surfaces with abrasion and stretch marks (**Table 3**).

Site	Colour	Surface	Thickness	Width	length	Section	N° facets	Knapping
Kami 7	Translucent	patina	17	27	41	R/B/A	5	Flakescar
	Translucent	patina	15	21	28	R/B/A	6	NO
	Translucent	patina	13	18	25	B/A	4	UNDET
	Translucent	well	15	21	25	UNDET	UNDET	Flakescar
	Translucent	very well	11	18	20	B/A	3	UNDET
	Translucent	patina	14	16	19	B/A	6	NO
	Translucent	patina	12	17	19	B/A	5	UNDET
	Translucent	Rolled/patina	8	14	17	A	6	Flakescar

Table 3.
 Techno-morphological characteristics of quartz crystals from the Kami 7 site.



Figure 6.
 Excavation of the Lainez site.



Figure 7.
 Elements of quartz crystal and bipolar obsidian fragment from the Lainez 1 site.

Lainez 1 site is located in the middle course of the homonymous valley. The area has a pasture vegetation near the banks of the river, frequently interrupted by extensive bogs. The open forest develops toward the slopes of the mountains (Figure 6). Near the site there are river meanders with pebbles of different sizes (i.e., in [22, 25]). On the site, an excavation and four surveys were carried out. Radiocarbon analysis indicates a date of 767–971 cal AD (OxCal V 4.3.2, SHtCal 13, 95.4%) (i.e., in [26]).

Among the lithic materials recovered in the excavations, two subsamples stand out. One is composed of two obsidian artifacts and the other by eight microflakes and a fragment of a quartz crystal instrument. The latter were discovered in the same survey of 1 m². The technofunctional studies showed no use in the instrument fragment, which due to its morphology could have been considered as micro-scraper, since its maximum length does not exceed 2 cm (**Figure 7**).

5. Discussion

The archeology of the central strip of Tierra del Fuego is key to understand the ways of human circulation along the territory of the Big Island. Technofunctional analysis including determination of raw materials provenience has demonstrated that there were long-distance movements of materials. Hypothesis derived from the ethnographic and historical records discusses these movements as exchanges included in social interaction networks between different groups along Tierra del Fuego (i.e., in [10]). In this research, we concentrated in a series of exceptional materials, i.e., quartz prisms. The objective of the analysis was to determine whether they had been either manufactured or used and to discuss their appearance in some sites within the mountain environment.

5.1 Meaning of quartz as manuports

The presence of these materials in Kami 7 and Lainez sites, in the central part of the Big Island, is extremely interesting in several aspects.

In the first place, it is not the case of materials that were taken to the site as raw materials for tool making, nor for uses of any kind, as it was revealed to be the technofunctional analysis, since they do not present any kind of modification.

Secondly, it is unlikely that their presence is natural in the sites, since they are not located close or within outcrops. Although the characteristics of the geology of Tierra del Fuego could allow the formation of quartz crystals, these are associated with the Le Maire formations, and so far no outcrops of large crystals have been identified. Some very small crystals were found in the Emerald lagoon area, in the Paso Francés valley that flows into the Domo Blanco hill. And others of larger sizes have been identified in the elevations near the springs of the Malengüena River (**Figure 8**).

It is also unlikely that the crystals correspond to secondary deposits formed by glacial or river drag. The microscopic analysis does not reveal the characteristic surface alteration traces produced by glacial or river erosion. Moreover, the crystals were in direct association and stratigraphy with the archeological materials of Kami 7 site, and the same happened at Lainez 1 site.

Consequently, we started to consider the possible scenarios for their arrival to the site, in routine migrations circuits or in more complex social interaction networks.

Circulation of materials along long distances is not a new phenomenon in Tierra del Fuego (i.e., in Refs. [25, 63]). It has been recorded in different contexts, such as the case of the Miraflores silicified tuff in the Kami 1 site, the quartz crystals in the Kami 7 site, the black obsidian and microflake of quartz crystal in Lainez 1, the silicified wood of Cabo San Pablo, and even the presence of a marine shell of *Fasciolaridae* family discovered in Punta Amarilla, an area inside the forest on the south coast of lake Fagnano (i.e., in [64]).

The Miraflores silicified tuff has its primary outcrop about 200 km in a straight line from Kami 1. The inhabitants of the Kami 1 site could have obtained this raw material directly from the outcrop, although it is a little improbable, due to both

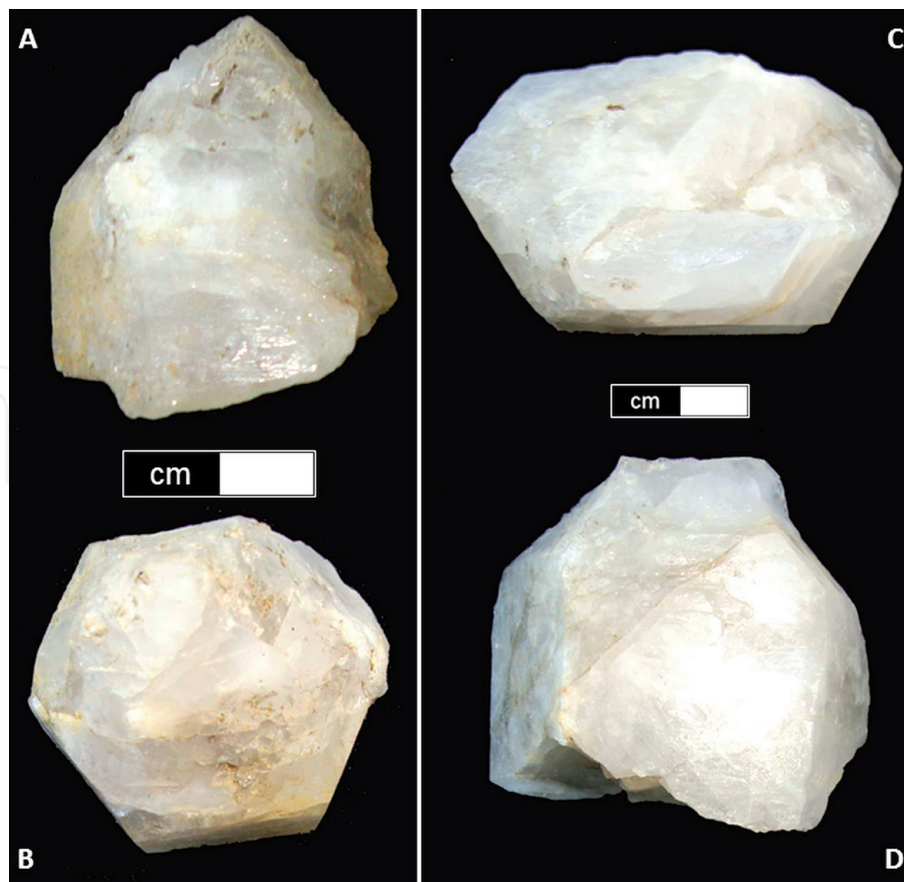


Figure 8.
Quartz prisms from the Malengüena River. (A–D) Different quartz prisms from the Malengüena River area. They show natural impact traces and erosion marks.

distance, different landscape units, and the technological characteristics of the tools and fragments from Kami 1 (i.e., in [63]). In order to get to source and assure provision of material, it would be necessary that the source be included in the mobility circuits for seasonal migration, or resource exploitation, of the group. Alternatively, the raw material could have been obtained through exchange with people from the northern or western territories of the island, where this silicified tuff has been identified, in low quantities, in several sites (i.e., in [63]).

In the case of Lainez 1 site, there are two fragments of black obsidian, a raw material that up to now has not been discovered in Tierra del Fuego. If it corresponds to a source located in the continent, on the other side of Magellan Strait, it would indicate long-distance interaction networks that interlink territories with different landscapes, peoples, and probably even languages. As here it is the case of just two non-used fragments, we believe that the most likely scenario corresponds to prestige goods exchanged in social interaction networks (i.e., in [63]). As for the elements of quartz crystal, outcrops or primary sources of this raw material have not yet been identified.

As for the silicified wood, a core was discovered in a site on the Atlantic coast. This raw material is very abundant across the Magellan Strait (in continental Patagonia), but in Tierra del Fuego, until now only one area was identified in the northeast, near Cullen River (i.e., in [65]).

We believe that the most relevant indicators for interaction recovered up to now are those that come from the analysis of raw materials use in the sites in the center of the island; they show evidence of nonlocal raw materials, which reveal then some mode of circulation. However, these observations suggest that their acquisition and conservation can be connected with symbolic or ornamental aspects related to social interaction (i.e., in [28]).

5.2 Interaction and symbolism in the hunter-gatherer populations of the area

There is an important number of publications where the role of quartz is evidenced as a raw material for the manufacture of artifacts that intervene in different production and use processes. But in addition, quartz, especially pyramidal or bipyramidal prisms or monocrystals, were used for symbolic and votive purposes, and they could even be part of the shamans' toolkits as suggested by Márquez Pecchio and Eielson (i.e., in Ref. [66]) in their work *Pre-Columbian Sculpture of Quartz*, where they comment that for some pre-Hispanic societies of Venezuela, the crystals were used as amulets by the shamans. It is also mentioned that because of their attractiveness, color, rarity, and difficulty in being found, they were objects that were included in exchange activities.

The central region of Tierra del Fuego was inhabited by a hunter-gatherer society until the beginnings of the twentieth century. There are many reports written by travelers who arrived during the eighteenth and nineteenth century and by missionaries and colonialists in the early twentieth century (i.e., in Ref. [1, 2]). However, the best information about these people comes from the work and publications of two ethnographers, Martin Gusinde, who made different stays in the island during the years 1920, and Anne Chapman, who worked in Tierra del Fuego since 1966 until her death in 2011 (i.e., in Refs. [3–5]).

According to the ethnographic data, each Selknam family had a territory that was considered as their “own,” called “haruwen.” However, the borders of these territories were relatively permeable. They could be opened, especially at certain times, such as for passage for aggregation events, or at critical times for the exploitation of animal resources (i.e., in [4]).

Aggregation events and particularly ceremonies played an essential role in maintenance of biological and social reproduction. The most relevant for the Selknam people was the initiation ritual of adolescent males, the Hain ceremony. While this ritual has as an essential objective the consolidation and maintenance of social order, it is also true that it is an opportunity to meet relatives or friends coming from different territories, who gather and camp together for months. These events were ideal occasions for carrying out exchanges and transactions (i.e., in [4]). They could take the form of gifts, understood in the sense of Levi Strauss (i.e., in [38]), reinforce social links among relatives, or constitute formal exchanges. In any case, mobility circuits, fortuitous meetings, or events as ceremonies, many of which were made up of families or distant groups that shared long periods of time, were propitious moments to exchange material goods, sumptuaries, ideas, etc. (i.e., in Refs. [3–5]).

As for circulation of other goods within the different groups and territories, the literature mentions an important circulation of materials, among which perishable resources are abundant: woods from the forest area that are exchanged with the neighbors of the northern steppe (in the form of bows, sticks, etc.) or sea lion skins from the coastal areas (i.e., in [3]). We believe that circulation could also include other resources that we consider critical, such as the case of the lithic raw materials. However, although there are all these mentions to movements and exchanges in mechanisms of reciprocity and redistribution, there are no detailed accounts of the type of prestige goods with symbolic value that could enter in this exchange.

6. Conclusions

In most of the cases of findings of distant origin materials that we have analyzed, these are materials that have entered the productive circuit, since they were modified into instruments and used. However, their small number, their distant

origin, and the fact that the complete operational chains are not present suggest the hypothesis that these materials could have arrived as “gifts” between relatives, in some of the interaction circuits that reinforce connections between distant groups.

Materials that by their exotism, or by their physical characteristics, their place of origin, etc. that were used by societies at various times and places, can be traced from the Middle Paleolithic with the incorporation, by Neanderthal societies, of such elements as marine fossils found at the Chez-Pourrez and the Grotte de l’Hyene (i.e., in [67, 68]).

The justification for these hypotheses can be found in the diversity of evidence of the use of quartz crystals in various archeological sites around the world. The use of this raw material can be divided into two fields of social activities of human groups: on the one hand, within the production and use process, included in the subsistence context, and on the other, within the activities of symbolic and/or magical character, granting powers by the shamans.

However, in the case of the quartz crystals that we present, there is an important difference, and that is that they were not manufactured or used. For this reason, they are considered as manuports. As we said, so far there have never been discovered so many crystals and of such large dimensions in sites of Tierra del Fuego. Then these crystals could have been collected somewhere for their peculiarity, their size, their translucent character, their rarity, etc.; they could have been considered as amulets or ornaments that could be used for exchange or have been obtained by exchange. From this point of view, we can consider them as elements that have an important ornamental or symbolic value and therefore circulated in reciprocity circuits that reinforced social structure.

Acknowledgements

We thank Dr. Ignacio Clemente Comte (CSIC, Barcelona), Dr. Jaques Pelegrin (CNRS, Paris), and Marcio Alonso Lima (UFMG, Belo Horizonte) who kindly accepted to look at these materials with us. Drs. Mauricio Gonzales Guillot and Pablo Torres Carbonell (area of Geology of CADIC-CONICET) for the geological information. Dr. Eugenia Raffi for the bleaching process of crystals.

Field and laboratory works were done within the scope of projects “Proyecto Arqueológico Corazón de la Isla” (D. C. y T., S. D. y P. Tierra del Fuego, Res. 285/97), PICT of the National Agency of Scientific and technological promotion (PICT 1236 and 2648), CONICET (PIP 0452).

IntechOpen

Author details

María Estela Mansur^{1*}, Hernán Horacio De Angelis², Vanesa Esther Parmigiani²,
María Celina Alvarez Soncini¹ and Anna Franch Bach²

1 Centro Austral de Investigaciones Científicas (CADIC-CONICET), Universidad Nacional de Tierra del Fuego (UNTDF), Ushuaia, Argentina

2 Centro Austral de Investigaciones Científicas (CADIC-CONICET), Ushuaia, Argentina

*Address all correspondence to: memansur@gmail.com

IntechOpen

© 2019 The Author(s). Licensee IntechOpen. This chapter is distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/3.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. 

References

- [1] Gallardo CR. Tierra del Fuego: Los Onas. Buenos Aires: Cabaut&Cia; 1998 [1910]
- [2] Bridges L. The Utter Most Part of the Earth. Translation: El último confín de la Tierra. Buenos Aires: Ed. Marymar; 1978 [1951]
- [3] Gusinde M. Die Feuer land Indianer. T.I: Die Selk'Nam. Mödlig-Wien. Translation: Los indios de Tierra del Fuego. I: Los Selk'nam. Vol. 2 Vols. Buenos Aires: Centro Argentino de Etnología Americana; 1937 [1982]
- [4] Chapman A. Los selk'nam. La vida de los onas. Buenos aires: Emecé; 1986
- [5] Chapman A. El fin de un mundo: los selk'nam de Tierra del Fuego. Ed. Vázquez Mazzini; 1989. 309 p
- [6] Mansur ME, Piqué R. Between the forest and the sea: Hunter-gatherer occupations in the subantarctic forests in Tierra del Fuego, Argentina. *Arctic Anthropologist*. 2009;46(1-2):144-157
- [7] Mansur ME, De Angelis H, Parmigiani V. Explotación de materias primas y circuitos de movilidad en la zona central de Tierra del Fuego. In: *Arqueología Argentina en el Bicentenario de la Revolución de Mayo. Proceedings of XVII Congreso Nacional de Arqueología Argentina Tomo V*. Mendoza; 11-15 Oct 2010. p. 1935-1940
- [8] Mansur ME, Hardy K, Piqué R. Landscape and human settlement dynamics in insular environments. An archeological approach. *Arctic & Antarctic—International Journal on Circumpolar Sociocultural*. 2011;5:63-84
- [9] De Angelis H, Parmigiani V, AlvarezSoncini MC. Prospecciones en el corazón de la isla grande de Tierra del Fuego. *Tendencias teórico-metodológicas y casos de estudio en la arqueología de Patagonia*. 2013:577-586
- [10] De Angelis H, Mansur ME, Parmigiani V, Alvarez Soncini MC, Franch A. Between mountains and glacial valleys. Archeology in the mountain ranges of the central strip of Tierra del Fuego. In: Presented in 18° Congres de l'UISPP. Université Paris 1-Panthéon Sorbonne. Francia. (in press)
- [11] Borrero LA. La economía prehistórica de los habitantes del norte de la isla grande de Tierra del Fuego [thesis]. Buenos Aires: Facultad de Filosofía y Letras, Universidad del; 1985
- [12] Borrero LA. Los selk'nam (onas). Su evolución cultural. Ed. Búsqueda-yuchán, Buenos Aires. 1991
- [13] Borrero LA, Lanata JL. Estrategias adaptativas representadas en los sitios de estancia maría luisa y cabo San Pablo. *Proceedings of IX Congreso Nacional de Arqueología Argentina*. Buenos Aires; 31-5 Nov 1988. p. 166-174
- [14] Miotti L, Salemme M. Poblamiento, movilidad y territorios entre las sociedades cazadoras-recolectoras de Patagonia. *Complutum*. 2004;15: 177-206
- [15] Orquera LA, Piana E. *Arqueología de la región del canal Beagle (Tierra del Fuego, República Argentina)*. 1st ed. Buenos Aires: Sociedad Argentina de Antropología; 1999. 146 p
- [16] Orquera LA, Piana EL, Fiore D, Zangrando AF. *Diez mil años de fuegos: Arqueología y etnografía del fin del mundo*. 1st ed. Buenos Aires: Dunken. 2012. 116 p
- [17] Massone M. Territorios, movilidad y construcción de paisajes en el mundo selk'nam. In:

Salemme M, Santiago F, Álvarez M, Piana E, Vázquez M, Mansur ME, editors. *Arqueología de Patagonia: Una mirada desde el último confín*. Tomo 1. Ushuaia: Utopías; 2009. p. 249-264

[18] Mansur ME. El Corazón de la Isla. *Arqueología de la zona central de Tierra del Fuego*. E Mundos Fueguinos. Doce Miradas. Sobre Selknam, Yaganes y Kawesqar. Santiago de Chile: Taller Experimental Cuerpos Pintados; 2002. pp. 148-166

[19] De Angelis H. *Arqueología de los cazadores-recolectores de la faja central de la Isla Grande de Tierra del Fuego*. 1st ed. Buenos Aires: Sociedad Argentina de Antropología; 2015. 280 p

[20] Orquera LA, Piana E. *La vida material y social de los Yámana*. Eudeba: Instituto Fueguino de Investigaciones Científicas; 1999

[21] Borrero LA, Casiraghi M, Yacobaccio HD. First guanaco-processing site in southern South America. *Current Anthropology*. 1985;26(2):273-276

[22] Borrero LA, editor. *Arqueología de la Patagonia meridional ("Proyecto Magallania")*. 1st ed. Entre Ríos: Ayllu; 1998. 133 p

[23] Mansur ME, Martinioni D, Lasa AE. La gestión de los recursos líticos en el sitio Marina 1 (zona central de Tierra del Fuego, Argentina). En: Belardi J, Carballo Marina F, Espinosa S. (eds.): *Desde el País de los Gigantes. Perspectivas arqueológicas en Patagonia*. Tomo I. Río Gallegos: Universidad Nacional de la Patagonia Austral. 2000:57-72

[24] Mansur ME, De Angelis H. Ambiente, recursos y dinámica poblacional en la faja central de Tierra del Fuego: El bosque subantártico. In: Zangrando AF, Barberena R, Gil A, et al editors.

Tendencias teórico-metodológicas y casos de estudio en la arqueología de la Patagonia. San Rafael: Museo de Historia Natural de San Rafael; 2013. p. 587-599

[25] Mansur ME, De Angelis H. Lithic resource management in mountain environments: The Andean sector of Tierra Del Fuego. *Quaternary International*. 2016;402:117-128

[26] Mansur ME, De Angelis H, Parmigiani V. Human occupations in the mountains of Central Tierra del Fuego: An archaeological approach. *Preistoria Alpina*. 2013;47:13-21

[27] De Angelis H. *Arqueología de la Faja central de Tierra del Fuego: Una aproximación funcional-espacial [thesis]*. Buenos Aires, Argentina: Facultad de Ciencias Naturales y Museo, Universidad Nacional de La Plata; 2013

[28] Parmigiani V, Alvarez Soncini MC, Iparraguirre A. Localidad arqueológica Kami 7, presentación general. In: Zangrando AF, Barberena R, Gil A, et al. editors. *Tendencias teórico-metodológicas y casos de estudio en la arqueología de Patagonia*. San Rafael: Museo de Historia Natural de San Rafael; 2013. p. 601-607

[29] Bogdanovic I, Camaros E, Angelis H, Lasa A, Mansur ME, Maximiano A, et al. El paraje de Ewan, un lugar de reunión Selk'nam en el centro de la isla. In: Salemme M, Santiago F, Álvarez M, Piana E, Vázquez M, Mansur ME, editors. *Arqueología de Patagonia: Una mirada desde el último confín*. Tomo 2. Ushuaia: Editorial Utopías; 2009. pp. 941-956

[30] Mansur ME, *Arqueología del Hain PR*. Investigaciones etnoarqueológicas en un sitio ceremonial de la sociedad Selknam de Tierra del Fuego. In: *Implicancias teóricas y metodológicas para los estudios arqueológicos*. Treballs

d'Etnoarqueologia 9. Vol. 220. Madrid: Ediciones CSIC; 2012. 176 p

[31] Alvarez Soncini M C, Legise S. Experimentación tecnofuncional con pulidores líticos y punzones óseos. En: Boletín de Arqueología Experimental. Madrid: Universidad Autónoma de Madrid. 2017;**12**:155-184

[32] Parmigiani VE, Alvarez Soncini MC, Mansur ME, Martinoli MP. El procesamiento de cueros de lobo marino (*Arctocephalus australis*) entre los canoeros magallánico-fueguinos: una evaluación experimental. BAEX. 2017;**95**:134

[33] De Angelis H, Huidobro C. Evaluando el uso de herramientas metálicas para la talla lítica en la Patagonia austral a través del análisis funcional de base microscópica. BAEX: Boletín de Arqueología Experimental Parmigiani V, De Angelis H, Alvarez Soncini MC, Baena J. Facultad de Filosofía y Letras, Servicio de Publicaciones de la Universidad Autónoma de Madrid. 2017;**12**: 31-71

[34] Berenguer R, Pimentel G. Introducción al estudio de los espacios internodales y su aporte a la historia, naturaleza y dinámica de las ocupaciones Humanas en zonas áridas. Estudios Atacameños. 2017;**(56)**:3-11

[35] Barberena R, Romero Villanueva G, Lucero G, Fernández MV, Rughini AA, Sosa P. Espacios internodales en patagonia septentrional: Biogeografía, información y mecanismos sociales de interacción. Estudios Atacameños. 2017;**56**:57-75

[36] De Angelis H, Mansur ME. Exploitation of allochthonous raw materials in hunter-gatherer contexts. Archaeological sites of Fagnano Lake, Tierra del Fuego, Argentina. Quaternary International. 2015;**375**:124-134

[37] Mauss M. Essai sur le don. Forme et raison de l'échange dans les sociétés archaïques. L'Année Sociologique. 1923;**1**:30-186

[38] Claude L-S. Les structures élémentaires de la parenté. Paris: La Haye, Mouton (1947); 1967

[39] Lima MA, Mansur ME. Estudio traceológico de instrumentos em quartzo e quartzito de Santana do Riacho (MG). Arquivos do Museu de História Natural UFMG. 1986;**11**:173-190

[40] Clemente-Conte I, Boëda E, Farias-Gluchy M. Macro-and micro-traces of hafting on quartz tools from Pleistocene sites in the sierra de Capivara in Piauí (Brazil). Quaternary International. 2015;**30**:1-5

[41] Petrin VT, Nokhrina TI, Kulik NA, Usacheva IV. Upper Paleolithic rock crystal artifacts from the southeastern shore of Lake Bolshiye Allaki, the Southern Urals. Archaeology, Ethnology and Anthropology of Eurasia. 2012;**40**(4):28-40

[42] Tardy N, Vosges J, Varoutsikos B. Micro-blade production on hyaline quartz during the late Neolithic of northern Greece (5400-4600 cal. BC): Examples from Dikili Tash and Promachonas-Topolnica. Quaternary International. 2016;**424**:212-231

[43] de la Peña P, Taipale N, Wadley L, Rots V. A techno-functional perspective on quartz micro-notches in Sibudu's Howiesons Poort indicates the use of barbs in hunting technology. Journal of Archaeological Science. 2018;**93**:166-195

[44] Xavier P, Alves C, Meireles, J. Geological raw materials from a mesolithic archaeological site in NW Portugal. In: Proceedings of 2nd International Electronic Conference on Geosciences (IECG '19); 8-15 June 2019; Multidisciplinary Digital Publishing

Institute; 2019. p. 23. DOI:10.3390/IECG2019-06191

[45] González MF, Sanjuán LG, Arnedo MJH, Palma JS, Wheatley D. El cuarzo como material votivo y arquitectónico en el complejo funerario megalítico de Palacio III (Almadén de la Plata, Sevilla): Análisis contextual y mineralógico. *Trabajos de Prehistoria*. 2008;**65**(2):137-150

[46] El EM. Chamanismo y las Técnicas Arcaicas del Éxtasis. Madrid: Fondo de Cultura Económica; 2001

[47] Elíade M. *Herreros y Alquimistas*. Madrid: Alianza Editorial; 2004

[48] Fábregas VR. Los prismas de cuarzo en la cultura megalítica del Noroeste de la Península Ibérica. *Brigantium*. 1983;**4**:7-12

[49] Meighan IG, Simpson DDA, Hartwell BN, Fallick AE, Kennan PS. Sourcing the quartz at Newgrange, Brúna Bóinne, Ireland. In: Burenhult G, Westergaard S, editors. *Stones and Bones. Formal Disposal of the Dead in Atlantic Europe during the Mesolithic-Neolithic Interface 6000-3000 BC*. Archaeological Conference in Honour of the Late Professor Michael J. O'Kelly, Oxford: BAR IS 1021; 2003. p. 247-252

[50] Levi JM. Wii'ipay: The living rocks—Ethnographic notes on crystal magic among some California Yumans. *The Journal of California Anthropology*. 1978;**5**(1):42-52

[51] Brady JE, Prufer KM. Caves and crystal-mancy: Evidence for the use of crystals in ancient Maya religion. *Journal of Anthropological Research*. 1999;**55**(1):129-144

[52] Koerper HC, Desautels NA, Couch JS. Quartz crystals and other sparkling minerals from the Bolsa Chica archaeological project. *Pacific*

Coast Archaeological Society Quarterly. 2022;**38**(4):61-83

[53] Fernández-Marchena JL, Ollé A. Microscopic analysis of technical and functional traces as a method for the use-wear analysis of rock crystal tools. *Quaternary International*. 2016;**424**:171-190

[54] Bueno Ramírez P, Balbín Behrmann R, Barroso Bermejo R, Alcolea González JL, Villa y Moraleda S. *El Dolmen de Navalcán. El Poblamiento Megalítico en el Guadyerbas*. Toledo: Diputación Provincial de Toledo; 1999

[55] Ramos Muñoz J, Giles PF. *El Dolmen de Alberite (Villamartín). Aportaciones a las Formas Económicas y Sociales de las Comunidades Neolíticas en el Noroeste de Cádiz*. Cádiz: Universidad de Cádiz; 1996

[56] Pradines S. *The rock crystal of Dembeni*. Mayotte Mission Report 2013. Nyame Akuma. 2013;**80**:59-72

[57] Moncel MH, Chiotti L, Gaillard C, Onoratini G, Pleurdeau D. Non-utilitarian lithic objects from the European Paleolithic. *Archaeology, Ethnology and Anthropology of Eurasia*. 2012;**40**(1):24-40

[58] Olivero EB, Malumián N. Mesozoic-Cenozoic stratigraphy of the Fuegian Andes, Argentina. *Geological Acta*. 2008;**6**(1):5-18

[59] Mansur ME, Lasa A. Diversidad artefactual vs. Especialización funcional. Análisis del IV componente de túnel I (Tierra del Fuego, Argentina). *Magallania*. 2005;**33**(2):69-91

[60] Álvarez MR, Lasa A, Mansur ME. La explotación de recursos naturales percederos: análisis funcional de los raspadores de la costa norte del canal Beagle. *Relaciones de la*

Sociedad Argentina de Antropología.
2000;XXV:275-295

[61] Mansur ME. Análisis funcional de instrumental lítico: problemas de formación y deformación de rastros de uso. In: Proceedings of XII Congreso Nacional de Arqueología Argentina; 22-26 Sep 1997; La Plata; 1999. p. 355-366

[62] Santiago FC, Pal N, Salemme M. Análisis tecno-morfológico y funcional del material lítico de superficie del sitio Las Vueltas 1 (norte de la Isla Grande de Tierra Del Fuego). Relaciones de la Sociedad Argentina de Antropología. 2009;34:231-250

[63] Mansur ME, De Angelis H, Alvarez Soncini MC, Parmigiani V. Toolkits, technology and resource exploitation in the forests of Tierra del Fuego. In: Gibaja J, Clemente I, Mazzucco N, Marreriros J, editors. Hunter-Gatherers Tool-kit: A Functional Perspective. (forthcoming)

[64] Alvarez Soncini MC, De Angelis H, Mansur ME, Parmigiani V. Evaluación del patrimonio arqueológico en la costa del lago Fagnano, Parque Nacional Tierra del Fuego, Argentina. Arqueología Iberoamericana. 2017;35:10-15

[65] Olivero E, López Cabrera MI, Reguero MA. Icnología de los depósitos fluviales de la Formación Cullen (Mioceno, Tierra del Fuego) y su relación con la Formación Santa Cruz (Mioceno) de Patagonia. In: Proceedings of III Simposio Latinoamericano de Icnología (SLIC '15). 17-27 Oct 2015; Colonia

[66] Márquez Pecchio JD, Eielson JE. In: Armitano E, editor. Escultura Precolombina de Cuarzo. Caracas; 1985. 130 p

[67] Lhomme V, Freneix S. Un coquillage de bivalve du Maastrichtien-Paléocène

Glyptoactis (Baluchicardia) sp. dans la couche inférieure du gisement moustérien de «Chez-Pourré-Chez-Comte» (Corrèze). Bulletin de la Société Préhistorique Française. 1993;20:303-306

[68] Poplin F. Aux origines néandertaliennes de l'art. Matière, forme, symétries. Contribution d'une galène et d'un oursin fossile taillé de Merry-sur-Yonne (France). L'Homme de Néandertal. 1988;5:109-116