People of the Coastal Atacama Desert Living Between Sand Dunes and Waves of the Pacific Ocean

Calogero M. Santoro, Bernardo T. Arriaza, Vivien G. Standen, and Pablo A. Marquet

Introduction

When Europeans colonized the coast of the Atacama Desert region (18°–27°S) in the sixteenth century they described the local people as skillful fishermen. In particular, Bibar (1966 [1565]: 12) observed:

Those who kill sea lions do not kill other fish, as we have said, and those who kill toninas [dolphin] do it routinely. In this way, each category of fisherman kills the type of fish of his specialty and no other; and when they die, it is custom to place the skulls [of marine mammals] and all the fishing tools such as nets, harpoons, and fishhooks on top of the grave.

This specialized labor force was not linked to complex forms of social organization as depicted in prehistoric cultures of the coasts of central Peru and northwestern North America. For this reason, the Europeans were not able to appreciate the cultural richness of the native populations that were settled along the coast of the Atacama Desert. For the Spaniards, these Indians were dirty and poor, with a simple way of life and modest possessions (Lozano-Machuca 1885 [1581]); thus, the sixteenth century Hispanic records provide no information relating to other cultural traits of this Amerindian population, such as funerary procedures, body painting, or tool decoration, nor about their geoglyphs and petroglyphs.

The coastal way of life has deep roots in the cultural history of the American continent, as it seems to be connected with the first people who immigrated into South America, late in the Pleistocene epoch. Around 11,000–10,000 years ago,
people focused on the coast of the Atacama territories and over several millennia they gradually transformed their culture. They created efficient technologies and strategies to maximize the subsistence possibilities provided by the Pacific Ocean and the desert coast (Llagostera 1992; Núñez 1983; Rivera and Rothhammer 1991; Standen et al. in press). This allowed them to reduce risks of the uncertainties typical of a desert environment as they lived between diverse habitats within a large but narrow territory along the coast. Despite the fact that the hunter-gatherers and fishermen of the coastal Atacama Desert inhabited a landscape with limited terrestrial resources, their descendants were able to create and develop a complex cultural system, with rather egalitarian political structures. However, the most fascinating creation of these early people was the development of sophisticated systems of artificial mummification, the ideological and social principles of which were arguably crucial for the maintenance of social ties. As we show below, artificial mummification, and its unknown cosmological world, was the most dynamic feature of the cultural history of these coastal desert people (Arriaza and Standen 2002).

Lying adjacent to the littoral of the Pacific Ocean in western South America, the Atacama Desert has a very limited range of edible plants and herded animals. This contrasts sharply with the Australian deserts or the Kalahari and Namib Deserts of southern Africa, which offer many (albeit patchy) terrestrial food resources for hunter-gatherers. These larger desert territories, however, lack the abundance of water seen in the Atacama in the form of permanent or seasonal streams originating in the high Andes, located around 100–150 km to the east (see Figure 13.1). This supporting network of water sources and the Pacific Ocean, one of the richest and most diverse marine biomasses in the world, creates unusual conditions allowing for the permanent occupation of this area by hunter-gatherers and fishermen. The first known inhabitants who arrived on the Pacific coastline of this region initiated a subsistence system that after 2,000–3,000 years of experimentation became strongly dependent on a wide variety of marine resources, hidden under the waves of the Pacific (Bird 1943; Llagostera 1992; Núñez 1983; Schiappacasse and Niemeyer 1984). They complemented their maritime economy with unpredictable and dispersed terrestrial resources, located along the quebradas (narrow deep canyons with permanent or intermittent courses of water) and oases touched by sand dunes swept by the desert winds.

The Selknam, hunter-gatherers of Tierra del Fuego, can serve as an analogy for understanding early Atacama populations. They inhabited an extremely harsh environment, but also developed a complex ideological system expressed in sophisticated ceremonies, which included body painting, masks, and performances representing supernatural characters. These rituals helped them to maintain and pass on their ideology and promoted social and biological reproduction. Similarly, Australian desert Aborigines continue to exercise complex systems of thinking and performance through a rich iconographic rock art and curation of tjuringa (sacred boards with painted or incised motif), comprising “a semiotic system that mediates social and territorial relations” (Rosenfeld and Smith 2002: 112), and body painting with the “appearance of ancestral forces” (Morphy 1998: 23). In these
cases we are dealing with highly abstract thought processes and complex aesthetic expression which appears to have originated in the late Pleistocene (cf. Mulvaney and Kamminga 1999).

In this chapter we present an analytical and comparative description of the origin and cultural evolution of people in the Atacama Desert, bringing together...
varied ecological and archaeological data to discuss the principal issues of the natural and cultural history of the region, from the late Pleistocene to the late Holocene (ca. 12,000–4,000 BP).

The Ecological Setting of the Atacama Desert

The Atacama/Peruvian Coastal Desert is one of the driest places on earth. Hyperaridity has been present in the central Atacama for at least the last 15 million years, although recent studies have documented environmental changes (Betancourt et al. 2000; Grosjean and Núñez 1994; Latorre et al. 2002). These paleoecological changes greatly affected the distribution of animals and plants as well as that of past human populations in this region. This desertic landscape, located on the west coast of South America, extends for more than 3,000 km along a narrow strip from northern Peru (Lat. 5°S) to northern Chile (Lat. 27°S). It owes its existence to the drying effect of the cold northward flowing Humboldt Current, the existence of air masses associated with the sub-tropical high known as the South Pacific Anticyclone, and to the rain-shadow effect of the Andean mountain ranges, which impedes the penetration of moisture carried by the eastern trade winds. Although this desert is continuous from Peru to Chile, it is usually broken into two main components. The Peruvian Coastal Desert extends from Tumbes (ca. 5°S) to Tacna in southern Peru (ca. 18°S), and the Atacama Desert from the area of Arica in northern Chile (ca. 18°S) to Copiapo (ca. 27°S) (Marquet et al. 2002; Rauh 1985).

The northern part of the Peruvian Coastal Desert consists of a wide coastal plain with shifting sands known as the Sechura Desert, some 100–150 km wide. During the terminal Pleistocene and Holocene this coastal desert provided more favorable living conditions in the form of spring water and shallow lagoons with fresh water, as documented in Pampa de los Fósiles in the Cupisnique Desert, of northern Peru. Further south in the Peruvian Coastal Desert, thick cloudbanks form over the desert lands as a result of the cooling effect of the Humboldt Current, as similarly occurs with the cold Bengela Current in the Namib Desert. When intercepted by isolated mountains or steep coastal slopes, this cool moist air gives rise to a fog zone known as garúa in Peru and camanchaca in Chile. This moisture allows for the development of isolated and diverse vegetation formations called lomas (small hills), where plants are adapted to condense this humidity. The lomas, comprising communities of annual and perennial plants (Herbaceae and Gramineae) and cacti (Dillon 1997; Rauh 1985), grow vigorously during a short period in the winter of the Southern Hemisphere, and attract a wide variety of animals and birds (carnivores, rodents, foxes). These ephemeral “fog oases” (Lavallée 2000) were occupied seasonally by hunter-gatherers whose base camps were located on the nearby coast (Benfer 1999; Quilter 1991).

The Atacama Desert, located between 18°S and 27°S, can be divided in three sections: north, central, and south (see Figure 13.1). The latter, being the driest, has negligible archaeological data and thus is not described herein. Flanked to the east by the high Coastal Cordillera, the littoral offers discrete bays and beaches for
human habitation, experiencing a mild climate (see Figure 13.2). In contrast to other Southern Hemisphere deserts (such as in Australia and southern Africa) average yearly precipitation is near zero. Thus the supply of fresh water depends on rain events outside the desert caused by convective air masses that cross the Andean crest bringing moisture laden air across the altiplano from the Amazon Basin. This phenomenon of the austral summer known as the *invierno boliviano* (the Bolivian or altiplanic winter) is responsible for the radical fluctuation of superficial runoff and groundwater that typically flows from the western slopes of the Andes to the Pacific. In the northern Atacama the runoff creates narrow and deep *quebradas* separated by 20–30 km of barren terrain with no vegetation at all. As rainfall gradually declines toward the south the *quebradas* do not reach the ocean, but rather discharge into inland basins, such as the Pampa del Tamarugal and Salar de Atacama in the central Atacama. The southern Atacama (24°–27°S) is a territory with no human habitation until recently, known as the *despoblado* (*depopulate*) *de Atacama*. In sum, although terrestrial biomass production is scanty and sparse, the existing water network, a distinctive feature of the Atacama Desert, offers a predictable resource for hunter-gatherers and fishermen.

*Figure 13.2* Typical landscape in the coast of the Atacama Desert flanked to the east by the high Coastal Cordillera, leaving discrete bays and beaches for human habitation, with a rather mild climate. The arrow shows shell middens of a permanent Holocene camp, south of Camarones Valley.
In contrast to limited terrestrial resources, the ocean offers a great variety and quantity of fish, molluscs, sea mammals, sea birds, and algae. This high productivity is triggered by a series of oceanographic, geographic, and climatic factors that produce very high levels of biomass (Llagostera 1992; Núñez 1983; Schiappacasse and Niemeyer 1984; Yesner 1980) crucial to the establishment of relatively permanent human occupations along the coast of Peru and Chile appearing in the late Pleistocene (Lavallée 2000; Llagostera 1992; Núñez 1983; Sandweiss et al. 1998, 1999; Schiappacasse and Niemeyer 1984). The Atacama Desert would have had a completely different cultural history if human populations had depended exclusively on terrestrial resources, as did many groups of the arid zone of interior Australia and the Kalahari (Hank 2002a). The combination of coastal and terrestrial resources is also observed in the Namib Desert, though the latter contains a much larger terrestrial biomass in terms of edible plants and animals (Hank 2002b).

The northern section, known as the Fertile Coast, is characterized by five valleys or quebradas that traverse the desert (see Figures 13.1 and 13.3). In the Peruvian Desert to the north, more than 50 wider valleys reach the coast (Lavallée 2000). At the mouth and upstream of these valleys one finds localized habitats in the form of oases, which host fruit-bearing plants such as Prosopis (a mesquite-like tree found...
in patches), small game (such as *Ctenomys*, a gopher-like fosorial animal), and camelids (*guanaco* – *Lama guanicoe*), abundant sea birds, small quantities of freshwater fish and crayfish, roots of reed and *tomatillo* (*Lycopersicon chilense*), and potable water. People also appear to have moved upstream to look for lithic raw materials, a resource which is noticeably absent on the coast. Conditions in the terminal Pleistocene appear to have been more lacustral than today, with fluctuations of a magnitude that are seen to have had varying effects on human populations – an issue which is still under vigorous debate (Grosjean and Núñez 1994; Latorre et al. in press; Núñez et al. 2002; Usselmann et al. 1999).

The central Atacama lacks the coastal oases, with fresh water restricted to brackish springs. The landscape is essentially barren and vegetation is restricted to *lomas*, the vegetation depending on the coastal fog which is reduced in extent along the coast and the Pampa del Tamarugal. This is a large inland basin connected to 15 to 20 *quebradas*, with Aroma, Tarapacá, Chacarilla, Guatacondo, and Maní being the most important (Luis Briones pers. comm.), and a series of *salares* (ancient dry lakes) located behind the Coastal Cordillera. These interior basins experienced wetter conditions by the end of the Pleistocene and also possibly the Holocene (Latorre et al. in press).

**The Peopling of the Region and Possible Migratory Routes**

Three human migratory routes have been proposed for the colonization of this desert zone by the end of the Pleistocene, linked to colonists entering South America through the Isthmus of Panama (ca. 13,000–12,000 BP). In the first route, people are argued to have moved from the Amazonian Basin to the cold territories of the high Andes. On the coast of the Atacama Desert these late Pleistocene immigrants are argued to have become hunter-gatherers and fishermen. Recent mitochondrial DNA analyses from late Holocene human remains of the Atacama (ca. 4,000 BP) illustrate a strong genetic link with current tropical forest populations (Moraga et al. 2002; Rivera and Rothhammer 1986, 1991). This does not necessarily mean, however, that all cultural traits found in the Pacific were imported from the Amazon Basin.

The second migratory route assumes that specialized hunter-gatherers, with sophisticated lithic industries, colonized the Andes from northern Colombia, next to the Isthmus of Panama (Rothhammer et al. 1984). According to Grosjean and Núñez (1994), during the mid-Holocene a period of drought affected the highlands of the central Atacama Desert, causing the shrinking of lakes and the reduction of biotic resources with a subsequent loss of hunting opportunities (but see Latorre et al. 2002; in press, for a different paleoecological perspective). Settlements are seen to have been abandoned, creating a *silencio arqueológico* (“archaeological silence”) as residential groups became more mobile or people concentrated in local refuges or moved to the coast (Núñez 1983).

Neither of these two hypothesized migratory scenarios is currently supported, as recent archaeological data show that the first permanent settlements occurred
Santoro, Arriaza, Standen, Marquet

slightly earlier on the coast (ca. 11,000 BP; Sandweiss et al. 1998) than within the highlands, where occupation is dated to ca. 10,800–10,600 BP (Núñez et al. 2002).

A third route proposes a migration along the coast from North America, with a population carrying an unspecialized lithic industry adjusted to coastal and marine environments (Llagostera 1992). Lavallée (2000) suggests that people used watercraft to cross the Pacific Ocean from Siberia to Alaska by the end of the Pleistocene. This is plausible given that colonists of Australia used watercraft to cross a similar distance from Southeast Asia along the Wallacea Islands some 40,000 years earlier than the first Americans (cf. Mulvaney and Kamminga 1999). Although this is an interesting and challenging hypothesis, it requires further archaeological testing using dated sequences from both the coast and interior.

The First Coastal Squatters (11,000–10,000 BP)

Evidence for the earliest late Pleistocene inhabitants is difficult to find, since most of the sites are now located on drowned landscapes. Richardson (1981) has suggested investigating littoral zones with narrow continental shelves, where the rising ocean caused less horizontal displacement of the shoreline (see Chapter 10, this volume, for an extended discussion of this issue in the Australian context). It is precisely this kind of context that has allowed the preservation above modern sea level of the sites of Quebrada Jaguay, Quebrada Tacahuay, Ring Site, and Las Conchas (see Figure 13.1). For areas with less steeply declining continental shelves few archaeological sites are found along the coast before ca. 6,000 BP, when much of the current coastline formed and was settled. The same phenomenon is described for the coast of the Namib Desert (Hank 2002b) and accounts for the appearance of later occupation of the Australian coast, as well as the coast of south central Chile (Quiroz and Sanchez 2004).

The earliest known occupation of the Atacama Desert took place at the end of the last glacial period, which was characterized by more humid conditions in the highlands between 13,000 and 9,500 BP, thereby providing the coast with higher discharges of freshwater. This process created exceptional estuarine habitats at the mouths of major valleys and small quebradas, including the formation of shallow freshwater lagoons, such as is found at the Ring Site (Sandweiss et al. 1989).

The earliest archaeological sites are dated to around 11,000–10,000 BP and correspond to groups with “specialized fish-netting technology,” as recorded in Quebrada Jahuay, the Ring Site, and Quebrada Tacahuay (Keef et al. 1998; Sandweiss et al. 1989, 1998). According to Sandweiss et al. (1998, 1999), site QJ 280 at Quebrada Jaguay is the only base camp dated to the late Pleistocene (ca. 11,105–11,088 BP), with evidence of post-holes representing an early form of architecture (Daniel Sandweiss, pers. comm.). It is interesting to note that people appear to have specialized their prey strategies in the capture of a single taxon of fish from the family Sciaenidae (calculated to be 17 cm in length, based on the size of the otoliths), and Mesodesma donacium, a species of mollusc bivalve normally found in sandy beaches (Sandweiss et al. 1998, 1999). Site QJ 280 also presents
abundant lithic debitage from the production of bifacial and unifacial artifacts, including obsidian that was imported from outcrops located 130 km inland, at an altitude of 2,850 m above sea level (asl) (Sandweiss et al. 1998). This suggests that people operated within a large territorial range extending from the coast to the Andes. At Tacahuay, a logistical camp with dates beginning ca. 10,800 BP, there is also an extraordinary preference for small schooling fish of the same average size and taxon (anchovies – *Engrundis ringens*, anchosas – *Anchoa* spp., shad, herring), and sea birds such as cormorant and boobies (deFrance et al. 2001). The use of fishing nets is inferred from the standardized size of the fish and the finding of a net fragment at Quebrada Jaguay dated to the Holocene (Keefer et al. 1998).

In the Holocene there is evidence for people diving in the sub-tidal zone to procure molluscs using an extraction tool known as *chope* used to pry molluscs from rocks, for hunting with harpoons for large fish and marine mammals such as sea lions (*Otaria juvata* and *O. flavescens*), for fishing with fishhook and fishing lines, and for the collection of algae. The lack of similar evidence in the terminal Pleistocene assemblages suggests that during the late Pleistocene and early Holocene people employed different procurement strategies to access marine and terrestrial resources.

**Gifted Holocene Hunter-Gatherers (10,000–4,000 BP)**

As deduced from several sites along the coast and the inland basin, by 10,000 years ago, human groups in both the northern and central sectors of the Atacama Desert employed a more specialized maritime economy, incorporating an integrated transhumance system (Núñez 1983). The archaeological sites along the coast comprise extended and more permanent open camps with shell middens that cover several square kilometers and which have a depth of more than 4 m, such as the Punta Pichalo site excavated by Bird in the 1940s (Bird 1943) (see Figure 13.4). Occupants employed a sophisticated tool kit that included fishhooks of vegetal thorns, weights and composite sinker hooks made of bone, ring-necked nets (*chinguillo*), and harpoon heads made of bone. They also manufactured a wide variety of lithic tools used as projectile points, knives, and scrapers. Obsidian implements and debitage are common at the coastal sites (Munoz 1993), indicating that foraging included journeys to the interior highlands and/or that these and other materials were obtained through exchange networks with peoples of these interior areas. By the mid-Holocene (after ca. 7,000 BP) maritime technology evolved to include fishhooks manufactured from *Choromytilus chorus* shell, awls, polishers, lanceolates and double points, burins, knife blades made on thick bifacial preforms, grinding stones, hand stones, choppers, multipurpose flaked tools made out of chalcedony and basalt, wooden darts, bags stitched with fiber, cords, and reed mats. Later in the Holocene (ca. 4,000 BP) the manufacture and use of shell beads and pendants, fringed skirts, reed brushes, lithic artifacts with ochre, and pelican skins appear in the archaeological record, pointing to the beginning of a new cultural era.
The lack of terrestrial animals appears to be “compensated” by the hunting of sea lions which were hunted with harpoons while asleep on rocky foreshores (Standen 2003). Molluscs were another source of protein, principally loco (*Concholepas concholepas*), lapas (*Fissurella* spp.), and chorito maico (*Perumytilus purpuratus*) (Luis Briones pers. comm.). The size of these species corresponds to individuals normally found in the intertidal and supratidal zones of rocky beaches. The evidence for watercraft at this time is still uncertain and seems to have been a later technological development.

Sites in the inland basin of Pampa del Tamarugal such as Tiliviche and Aragón (see Figure 13.1), located 40 km from the littoral and about 950 m asl, appear to have served as transitory logistical camps. It is thought that groups traveled there to gather raw material for lithic artifacts, to collect reed fiber, to gather scanty terrestrial plants, and to hunt small game. These camps were occupied from 9,000–4,500 BP when this region experienced wetter conditions (Latorre at al. in press). At Tiliviche there is evidence for domestic structures consisting of simple circular and shallow depressions surrounded by post-holes dug into the hard ground of the terrace (Núñez 1983; see Figure 13.5). These kinds of wind shelters were possibly covered with reed mats, fur, and branches. Domestic refuse was dispersed around these enclosures, and after their abandonment, they were covered.

Figure 13.4 Shell midden at Punta Pichalo in central Atacama Desert, which demonstrates the permanent and intense occupation of the coast based on a hunting-gathering marine economy, during the Holocene (picture taken by Junius Birds in 1939; reproduced courtesy of the American Museum of Natural History). Grete Mostny, former Director of the Museo Nacional de Historia Natural, is shown in the right corner.
by refuse from nearby dwellings (see also Quiani 9, a middle Archaic camp, located in the south of Arica; cf. Muñoz 1993).

Social and Ideological Complexity in the Atacama Desert Coast

According to Arriaza and Standen (2002), one of the most remarkable aspects of coastal Atacama Desert people were the processes they used to mummify their dead. This cultural trait is labeled “Chinchorro” after the name of a beach, north of Arica, where the first evidence was found by Max Uhle, early in the twentieth century (Uhle 1919). Geographically this phenomenon has a rather narrow distribution from Ilo in southern Peru, to Patillo south of Iquique, approximately 300 km in length (see Figure 13.1); to date there is no evidence of artificial mummification away from the coast. The earliest evidence to date for mummification was located at the mouth of the valley of Camarones (see Figures 13.1 and 13.3), where Virgilio Schiappacasse y Hans Niemeyer established the association of domestic debris and Chinchorro inhumation. These findings in the Atacama represent the most ancient (ca. 8,000–7,000 bp and 3,500 bp) artificial mummification known in the world, a typical trait of the northern and central Atacama
Desert. South of Patillo, still in central Atacama and in the southern Atacama, artificial mummification was not part of the Huentelauquen Tradition linked to the Las Conchas site (see Figure 13.1) in Antofagasta (Costa-Junqueira 2001; Llagostera et al. 2000). Although natural mummification was likely known to the Chinchorro, they created their own unique artificial mummification methods. These methods drastically transformed the bodies, halting decomposition, and were seen to allow the dead to “participate” in a new social context of unknown meanings within an egalitarian social system. It is important to note that the highland and coastal hunter-gatherers of western South America developed a wide variety of procedures to “manipulate” their dead. These practices become associated with ceremonial centers linked to the elite of highly stratified societies of the central Andes (Santoro et al. in press).

Arriaza and Standen (2002: 23) point out “societies with centralized socio-political power and class differentiation would have richer and more sophisticated mortuary rites allocated for elite members than hunter-gatherer societies.” They created a “variety of techniques of artificial mummification that transformed the bodies into gleaming black or red statues, a sharp contrast to the opaque shades of the desert” that rivals those of complex societies. Arriaza (1995) classified the body preparation procedures as black, red, bandaged, and mud-coated mummies. The black, red, and bandaged mummies correspond to the category known as complex preparation (Uhle 1919). This great variety of mummification methods changed through time from black to red, and from red to mud-coated techniques.

The “black mummies” were the most elaborate, requiring more time and knowledge of anatomy for their preparation. Examples of these mummies have been radiocarbon dated from 7,000 to 4,800 BP. According to Arriaza and Standen (2002), these bodies were completely skinned, disarticulated, and the organs and muscles were removed. Subsequently, the skeleton was rearticulated and the bones reinforced with sticks and reeds. The body cavities (head and trunk) were stuffed with ashes or dry grasses. Later, they modeled the entire body with an ash paste, recreating the original volume of the corpse. Following this process, the morticians reattached the skin, possibly the body’s own or that of an animal (seal or sea lion) and the head was adorned with a short, black haired wig. The Chinchorros also kept and modeled some of the facial features and genitalia. As a final touch they painted the mummy with a thin layer of black-blue manganese paste; hence the reason for the title “black mummy” (Arriaza and Standen 2002: 29).

The “red mummies” were simpler than the black ones in their preparations, characterized by incisions and sutures at the shoulders, groin, knees, and ankles with the objective of removing the organs and part of the muscles. The head was disconnected from the trunk and the brain removed. All the body cavities were dried with glowing coals and ashes, a custom known also in the coast of central Peru, where people added salt to treat their dead (Benfer 1999). Wooden poles were slipped under the skin through the arms, legs, and spine of the deceased to provide support and rigidity. The cavities were stuffed with feathers from sea birds (pelicans, seagulls), different types of soils, and wool from camelids (llamas (Lama glama), alpacas (Lama pacos), guanacos, or vicuñas (Vicugna vicugna), the
other wild American camelid only found in the high Andes, >4,000 m asl). The head was treated similarly – they added a long wig made from locks of human hair and a paste of manganese paint for the face, modeling the facial characteristics, as well as securing the wig to the head. Afterwards, the entire body except the face and wig was painted with red ochre. This red style first appeared approximately 4,000 years BP and continued for almost 500 years (Arriaza and Standen 2002).

The “bandaged mummies” were basically a variation on the red mummies except the skin was reattached in the form of bandages. The “mud-coated mummies” were naturally dried bodies that were covered with a layer of mud, possibly prepared with a mixture of earth, water, and an adhesive of unknown origin (Arriaza and Standen 2002).

Why did these groups expend so much energy and engage in such complex procedures to prepare their dead? Perhaps it was thought that the dead were going to face an unknown world of supernatural metaphysical forces or perhaps, instead, they would start a new life within their own community; therefore becoming a new category of social actor. It may be that their function was to mitigate the impact their death caused in their own social group. We do not know the reasons why different mummification procedures were applied to members of the same group and if the members who received greater attention enjoyed greater social prestige during their lifetime and had certain privileges that they maintained even after death. These questions warrant further investigation.

Arriaza and Standen (2002) suggest that through the act of mummification groups produced inanimate beings with simultaneous spiritual bonds to the living, their ancestors, and to the gods. Particularly, it might be possible that post-mortem manipulation of the dead began due to beliefs that “the soul of the deceased runs the risk of losing its existence if the body decomposes, or the living would lose contact with the soul of the deceased should the body decompose” (Arriaza and Standen 2002: 40–1).

Thus, these mortuary rituals may have been necessary to ensure the eternal existence of the body and the soul of the deceased, as well as the continuity of the group (Arriaza and Standen 2002: 40–1). What is certain, however, is that the Chinchorro invested a considerable amount of time and energy in mummifying their dead, which makes these mummies a unique phenomenon in the world, as much for their antiquity as for the social context in which they were produced. The technical knowledge and ideological concepts tied to mummification, as well as the subsistence patterns which underpinned these, all required a system that allowed for the preservation of a historic memory for several millennia. To ensure the cultural continuity of such a legacy from one generation to the next, people adopted a course of action which included mummification. This practice may have served to preserve internal cohesion, reinforce social integrity, and perpetuate a collective historic memory. The momentum created by the actual process of mummifying a newly deceased member of the community may have created a self-sustaining milieu for the Chinchorro people. Codes of social conduct could be instilled during the process of mummification, as this practice may have created the necessary conditions for cultural transmission and reproduction.
Conclusion

The cultural history of the people in the Atacama Desert can be divided into three major epochs, summarized as follows. The early epoch corresponds to immigrants arriving on the coast of the Atacama no later than 11,000 BP at Quebrada Jaguay and Quebrada Tacahuay, north of Arica. The available archaeological data show that these people were equipped with simple and non-specialized technologies and focused their procurement on a narrow spectrum of molluscs, sea birds, and fish. There is, however, evidence for the possible use of nets for fishing, even at this early stage. Populations also occupied the high Andes at altitudes of 3,000–4,500 m asl on the margins of the desert from around 10,800 BP, but here they employed a more technologically sophisticated lithic industry characterized by highly formalized tools for the capture and butchering of large game (including camelids, deer, and occasionally the American horse), as well as small rodents and birds (Aldenderfer 1999; Núñez et al. 2002; Santoro and Núñez 1987). This different adaptation may be linked to the arrival of two cultural “traditions” to the Atacama Desert, which maintained their character through prehistory. While the modern descendents of these original coastal peoples are hard to distinguish among the current population of the coastal cities, the highland people have survived the pressure of European invasion and the acculturation trends of the modern republic and today they assert different forms of social and ethnic recognition.

The first populations detected archaeologically in the Atacama may be related to earlier immigrants into the Americas, from 13,000–12,000 BP (or even earlier). They may have moved rapidly through new lands, as Birdsell (1977) suggested for Australia, leaving behind parties that started the more serious process of colonisation as seen in Quebrada Jaguay (site QJ 280) at around 11,000 years BP (Sandweiss et al. 1989). This fast movement of the colonists is consistent with the tight chronological sequence of the first Americans, given that there is no clear chronological gap between the earliest known settlements in North vs South America. In fact, the earliest Paleo-Indian site in the South Americas is Monte Verde, south of Chile, dated between 13,500 and 12,500 BP, with other early sites from Patagonia (i.e., Cueva del Medio, Piedra Museo, and Los Toldos) dated to between 12,390 and 12,890 BP (Massone and Prieto 2004). The occurrence of later dates for the first occupants of the Atacama Desert provides a challenge for future archaeologists to investigate whether a cline in settlement of this desert has occurred (a lag effect) or whether sites of comparable age have simply not been investigated yet or have not survived due to taphonomic processes.

In the second epoch, dated to the Holocene, the coastal desert people show a clear shift in their subsistence technology, as well as their social and ideological strategies, which persevered, with only minor changes, for several millennia. The material expressions of this new ideology seem to have been quite dynamic, as seen in the wide variety of methods used for artificial mumification. Specialized technological solutions for exploitation of marine resources were developed by
the mid-Holocene, and remained in place with only minor changes until late prehistory.

A distinctive feature of the hunter-gatherer-fishermen of the Atacama Desert was the opportunity to engage in agriculture, afforded by the presence of valleys and *quebradas* that cross-cut the desert in the northern section (see Figure 13.3). From ca. 4,000–3,000 BP the introduction of agriculture is seen to complement a maritime focused economy, thereby allowing desert people to establish permanent settlements in the form of small hamlets, with simple architecture (wooden posts, reed mats, and cane) of no more that 10 hectares in extension, as seen late in prehistory. This kind of infrastructure is commonly found along the *quebradas* and inland basins, such as Pampa del Tamarugal. Along the coast, people maintained more simple open camps until the sixteenth century AD; the time of the European invasion. This change in the way of life of the peoples of the coastal Atacama Desert can be accommodated by the concept of the “Neolithic Revolution,” as coined by the influential Australian archaeologist V. Gordon Childe, whose ideas were incorporated into the interpretation of Andean cultural history during the 1960s and 1970s. This “revolution” within the coastal economies of the Atacama did not result in substantial change in staple foods, however, as these were still provided by the ocean. Processes of social class differentiation and other cultural “sophistication” classified elsewhere as “civilization” took a different form here. The waves of the ocean and the sand dunes of the desert witness a different human social creation that we have attempted to shed some light on within this chapter.

**References**


SANTORO, ARRIAZA, STANDEN, MARQUET


People of the Coastal Atacama Desert


Lozano-Machuca, J. 1885 [1581]: Cartas del Factor de Potosí Juan Lozano Machuca al Virrey del Perú, en donde se Describe la Provincia de Lipes. Madrid: Relaciones Geográficas de Indias, Tomo II.


SANTORO, ARRIAZA, STANDEN, MARQUET


