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Moving: Hunter-gatherers and the cultural geography of South America

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ABSTRACT

The conditions under which the process of human colonization of South America took place are discussed. The modes of acquisition of environmental knowledge, as a way to construct a cultural geography, are also considered. An example concerning the peopling of the forests, particularly in Northwest South America, and the role of plants in the early stages of colonization is also offered. Finally the significance of non-utilitarian items, exchange, and empty lands for our understanding of the process of peopling is discussed.

1. Introduction

Even when there is no consensus about when and how the process of peopling of South America started, the available evidence indicates that ecologically disparate regions of the continent were already occupied around 10,000 BP (Politis, 1999; Dillehay, 2000; Aceituno et al., 2013). This was a process that surely involved generalist hunter-gatherers with the necessary flexibility to exploit different niches. There is archaeological evidence of diverse lithic industries, use of large and small terrestrial and marine vertebrates, and intense exploitation of plant resources (Stahl, 1996; Dillehay, 2000; Ranere and López, 2007). At the same time, the existence of this variety of adaptations requires a long previous history of peopling. No matter how fast was the process of human peopling, several generations of people interacting with the environments, and with the local climates, would be needed to be successful in so many regions. These people have to understand the new environment and then transform it as a result of its exploitation.

The variety of habitats exploited ca. 10,000 BP also suggests that the history of the human expansion into South America was not simple, and that a number of theoretical and practical issues should be considered. The situation is of course similar to that of the colonization of other regions of the world. From a theoretical point of view what is implied is that the "net diffusion through time was simple a by-product of how people lived in landscapes" (Denham et al., 2009: 29), in other words an exaptation (see Gamble, 1994). If this explanation is valid, then there is no requirement of major migrations, be it fast or slow, to explain the displacement of people. On the other hand, practical issues fall within the purview of what can be called a taphonomic approach to the archaeology of peopling. In the first place it includes what I call "Regional taphonomy", that is a concern for the distribution of preservational pockets in the landscape and the study of the mechanisms that accumulate and preserve materials (Borrero, 2001). The construction of a continental scale taphonomy is a difficult task, one that can only be delineated at this time. The basic idea is to apply this approach at the same geographical scale at which archaeological projects work. The goal is a better definition of the archaeological problems implicated in the processes of exploration and colonization. A first distinction is between large environmental patches, as can be defined for the Late Pleistocene (Clapperton, 1993), and a relatively sharp definition of the relevant habitats for the first inhabitants within those patches. These can be defined on the basis of paleoecological research, particularly the paleodistribution of corridors and other biogeographic features. Variation along a number of taphonomically relevant properties can be examined. Among other measures, the proportion of space covered by different classes of soils constitute a first approximation to understand differences in bone preservation among patches, while charts of the impact of erosion mark differences in the feasibility of burial and general visibility of the archaeological record. A ranking of past habitats in terms of archaeologically relevant properties should be the main result. For example, the evidence showing that large parts of the Pacific coast of South America were affected by the action of tsunamis is relevant for our assessment of the early exploration of the coastal habitats (López-Castaño and Cano-Echeverría, 2012: 49).

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The amount of knowledge of the environment available to the early colonizers can be inferred from the archaeological record. For example, after examining the evidence from early coastal sites in Peru, Dan Sandweiss was able to conclude that "people knew how to exploit the sea when they first arrived in Western South America, or shortly thereafter" (Sandweiss, 2008: 153). Information to discuss this at the continental scale is not available, but some cases can be explored. The first product of this approach is a re-reading of the archaeological record in terms of evidences of knowledge of the environment by the first inhabitants. Only a very crude approximation to these issues can be considered here, where we will specifically discuss issues related with the archaeology of tropical forests, of empty lands and the importance of non-utilitarian items.

2. Exploration

An ecological model of this process may be useful in selecting the relevant data. I have previously used such a model to organize the archaeological information from Fuego-Patagonia (Borrero, 1989–1990, 1989). This model contemplates the human exploration of new lands, sometimes followed by colonization and effective occupation. The reason to call one stage of this process "colonization" is that it is difficult to view a group of explorers as cut off from their original population (Rogers, 1990). The biological viability of those explorers that will allow them to be colonizers is based on the fact that ties with their mother group are not shut off. One of the main properties of this model is that it does not require constant southward movement, but only a slow multidirectional flow of people. In some way, this is convergent with results of human morphological studies that indicate that the peopling process was "probably the result of multiple discrete expansions of highly variable founder populations" (Delgado-Burbano, 2012: 35). Discussing the early archaeology of North America, Hofman wrote that many times the repeated use of specific high-quality lithic sources led to believe that "their long-term pattern of land use should have resulted in lithic distributional patterns suggesting one-way movement, even if people moved in complex patterns" (Hofman, 2003: 234).

The mechanisms behind movement probably included the gradual extension of hunting ranges, the fission of bands, the search for high quality raw material sources, and perhaps also starvation, curiosity, and other causes, principal among them the simple act of living within a variable home range (Anderson and Gillam, 2000; Belovsky, 1987; McGhee, 1997: 125–126). Problems in the home territory may also be a cause for movement, as recorded in the classic ethnographic example of the 19th Century Inuit migration (Mary-Rousselière, 2008 [1980]). In general terms, Kelly described the situation of expansion as one of "giving up a known environment for an unknown environment" (Kelly, 1999: 124). It is true that hunter-gatherers surely bring with them a variety of strategies and technologies useful for a number of circumstances, but this does not implies that "people never enter unknown territory" (Randall and Hollenbach, 2007: 220).

The availability of hierarchically ordered space, and the structure of critical resources should have directed people in different directions, not necessarily filling all ground behind. Places with fauna that lack anti-predatory behaviors were probably initially favored, even when most published studies suggest that these behaviors were probably rapidly learned (Berger et al., 2001). A strong negative impact on the success of explorers could be the result of the prey increasing vigilance or improving its escape abilities.

For this and other reasons, the resulting distribution of people should be discontinuous, leaving many empty zones and with some differences between "settling-in" and "on-the-move" places. The visibility of those places should be very different, and it can be maintained that most of the discovered early archaeological sites correspond to the first class. The usual trend toward the study of large sites goes against chances of finding sites related with an exploration stage.

The criteria to find and recognize the first stages in the process of exploration and colonization of any region are not completely understood. Generally speaking, archaeological markers that signal lack of local knowledge are useful, because they are indicative of partial familiarity with the local geography. In another level, they also mark the possibility of maladaptations, suggesting that local extinctions (extirpations) and cultural failures may happen. A recent review of the limited evidence for the earlier human remains in America showed that earlier people were living a life with "a significant amount of risk", and that "stress on Paleoamerican females makes it unlikely that the population of the first Americans could have grown rapidly" (Chatters, 2010: 67). The result at a supra-regional scale should be spatial discontinuity of the human settlement (Butzer, 1988). Similar situations are modeled by the "point and arrow pattern" proposed by Rockman, in which there is "movement in which colonizers "stream" from known areas to new areas, leaving the areas in between uncolonized" (Rockman, 2003: 9). I have reiteratively sustained that early settlers need not have a perfect adjustment to their environments. For example, the cases of the Holocene sites Túnel and Imiwaia in Tierra del Fuego (Fig. 1) are good examples of places where the knowledge of the local resources appear not to be high for the first inhabitants (Piana et al., 2012), a situation that contrasts with later occupations that indicate a detailed knowledge of the local resources (Orquera and Piana, 2009).

The potential markers of the degree of familiarity with the local resources are varied, including evidences of sub-optimal use of the available resources (Muscio, 2001). Exploration refers to the initial radiation of humans to new empty land (see Borrero, 1994-1995). Less resistance routes are usually implicated and most of the settling-in places are probably widely separated. Undoubtedlly, the visibility of relevant materials should be low, since sub-optimal places probably were not reoccupied. The basic criteria to recognize these sites include chronological precedence, in other words the older sites or older archaeological strata within a region are candidates. Application of this criterion is in no way restricted to the Late Pleistocene, but to the older evidence in any given habitat or region. The presence of few remains should testify to exploration stage occupations, many times at sub-optimal locations. Identification of the substrate on which the older occupation rests is also informative. For example in large sections of northeast Tierra del Fuego, the older substratum is slightly older than 4000 radiocarbon years. Any occupation around that age which is resting on that substratum is a candidate for an exploration stage representative. Similar situations with dates immediately after deglaciation exist along the Andean Cordillera.

More specifically, limited redundancy in the early occupations and the existence of occupational gaps indicating discontinuity in human installation, with cases of alternate use by carnivores and humans, are also expected. Trans-generational time frames should be usually implicated. Other expectations include use of abundant local raw materials, independently of its quality. Moreover, Franco studied the criteria to recognize an exploration stage using lithic artifacts. She expects tools not to be broken, as they should be expediently made on local rocks. Long-cutting edges should be dominant and the few cases of exotic rocks are to be understood in the context of personal gear (Civalero and Franco, 2003; Franco, 2003). All these expectations were met in her analysis of the early Patagonian assemblages. Importantly, she concluded that versatility (sensu Nelson, 1991) is adequate for the task, particularly bifacial tools with high transportability (Kelly, 1988). A number of

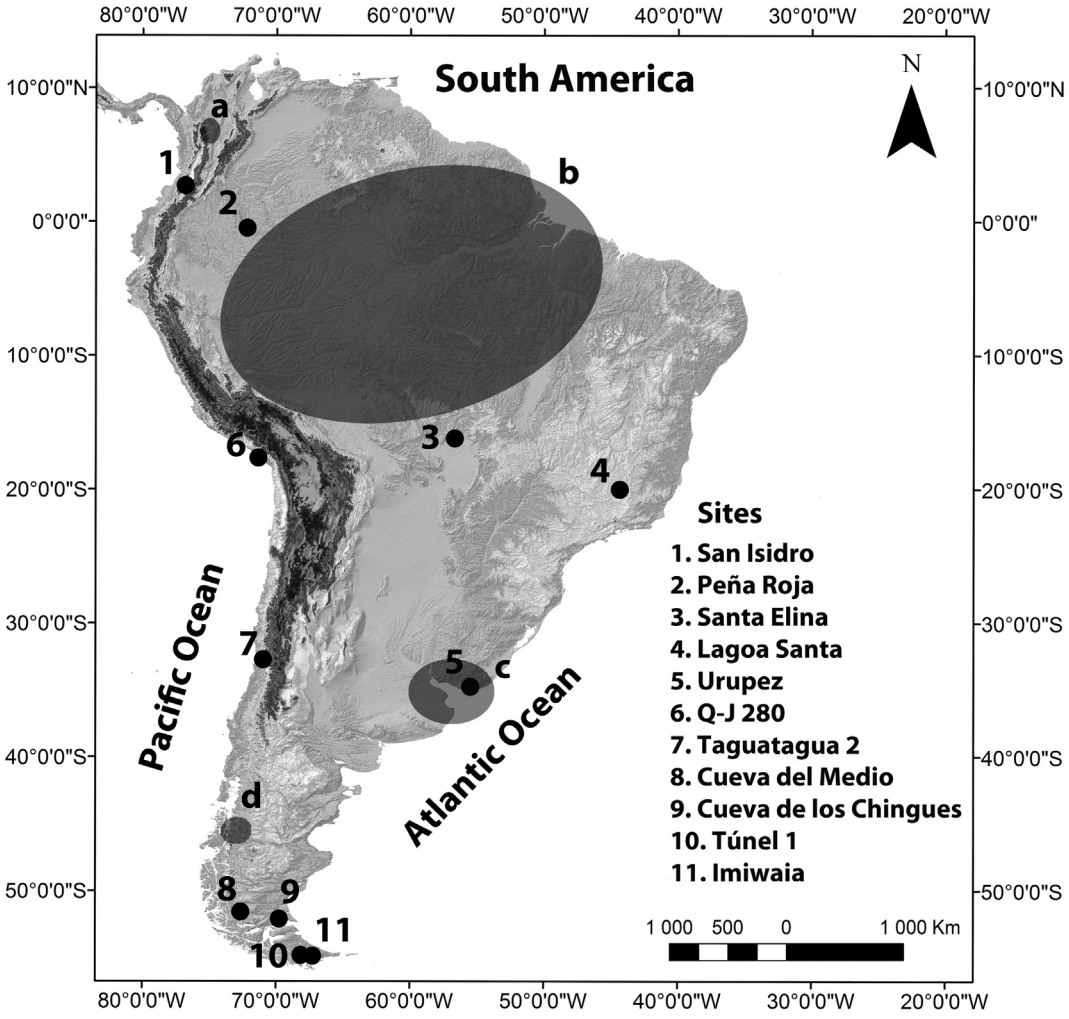

Fig. 1. South America and location of archaeological sites mentioned in the text. A = Porce Basin, B = Amazon Basin, C = Rio de la Plata Basin, D = Simpson Basin.

studies in different cultural settings of the world recently suggested that levallois technology was adequate for wide ranging movements in relatively unknown territory (White and Pettitt, 2011: 75). This is relevant because levallois technology was recognized in South America, and its distribution and significance is just beginning to be understood (Nami, 1992; Franco, 2004; Morello, 2005).

Generally speaking, the early stages of exploration promote the conditions under which there is a role for exaptations (Borrero and Borrazzo, 2013). The main reason is that in environments under colonization there are new needs and also unknown or poorly known resources. Hunter-gatherers have ways to deal with unexpected situations: for example Binford describes the skills of the Umialuk among the Nunamiut, who "knows how to use knowledge and has great knowledge depth regarding the long-term behavior of animals – what might be called the regularity in their erratic behavior" (Binford, 1991: 55). This knowledge simply covers the behavioral range of a known species. It is a different story to deal with new species for which knowledge is incomplete. Importantly, there is always the "risk of applying preconceived and perhaps faulty models to a landscape" (Meltzer, 2009: 372). This is one of the reasons why colonizers of diverse lands probably were not specialists. This marks an important difficulty with Kelly and Todd's model of colonization, which states that the first inhabitants of a region has no need to occupy new niches (1988: 235). This can be sustained for North America, but only by restricting their movements to the Andean region it was possible for the explorers of South America to remain in the same niche. The available evidence on the distribution of early sites suggests that a variety of niches were exploited by the end of the Pleistocene (Roosevelt et al., 1996; Borrero, 2004; Aceituno et al., 2013.). Another reason for the early explorers not to be specialists is that on all accounts the dependency on meat, particularly lean meat, known as "Rabbit starvation", should be avoided by including carbohydrates in the diet (Speth and Spielmann, 1983). Early explorers should have wide generalist diets, which perhaps should differ markedly from diets of posterior inhabitants. Although the bioanthropological record for early population is meager, these changes should be detectable in stable isotopes values, and perhaps in other bioanthropological markers (Guichón, 1994; Chatters, 2010).

3. Peopling South America

Early explorers of South America were probably using varied criteria in order to rank potentially attractive habitats, in relation with their previous knowledge and technium (Arthur, 2009; Borrero et al., 2013), which are the basic tools used to transform the geography. At the landscape scale, habitats are larger units than those that Optimal Foraging Theory usually treat as a patch, sometimes similar to what Beaton (1991) called megapatches. Quality and availability of raw materials and other basic subsistence

needs were probably paramount in deciding which places were more interesting to be settled, but probably were not the only criteria. Minimally, distance to their original populations and the location of neighbors must have been important. For example, the Pacific coastal habitats are largely recognized as highly productive and homogeneous along long distances (Dixon, 2001; Erlandson, 2001; Kelly, 2003a), and can be considered as a series of megapatches (sensu Beaton, 1991), where people "simply kept with an adaptation that they knew" (Kelly, 2003a: 139). Miotti considered the alternative of a process of peopling following the Atlantic coast of South America which could have also involved homogeneous megapatches (Miotti, 2003: 163–164). However, there is no evidence of strong selectivity for those coastal environments during early times. The borders of patches or megapatches are attractive spots, usually associated with access to a larger set of subsistence resources. On that basis Martino et al. conclude that, "when a resource diminishes in one habitat, they can have quick access to equivalent or alternative resources from another habitat; and this characteristic may favor dispersion" (Martino et al., 2007: 6). This suggestion ignores the fact that the process of colonization could not be accomplished simply by appropriation of what is available, but that it is mediated by a process of reconnaissance of the existent resources and the ways of exploiting them. The archaeological record is also a record of the increasing knowledge of the environment and its resources through time, which in turn is associated with its transformation into a cultural geography. Corridors in NW South America produced by deglaciation and volcanic activity probably facilitated the access to the forests (López-Castaño and Cano-Echeverría, 2012), a process that necessary implicates successive changes in the list of exploitable resources. The construction of habitat implicates both reversible and irreversible changes which will have differential archaeological results and signals. Discussions about the efficiency of the adaptations exist, but they are not usually very useful. For example, Riches (1982) suggested that individual hunting was more efficient than herd hunting, but there is a difficulty in comparing the efficiency of different strategies (Aschero and Martinez, 2001: 236–237), and both classes of strategies may prove adequate or even optimal under different sets of conditions. The point is that they will produce a quite distinct archaeological signal on the landscape and a different effect on the prey population. In the first place, efficient strategies are more visible, simply because they are associated with higher redundancy in the occupation.

3.1. Forests

More specific examples are provided by the available information for the exploration of the tropical forests of Colombia or Brazil. The timing of the early exploration of forests is an issue that goes beyond the case of South America. The Amazonian evidence runs counter to the principle asserting that only the possession of metal tools allows humans to colonize forested environments (see Politis and Gamble, 1994). However, one thing is to recognize that humans are fully capable of coping with forested environments, and another to maintain that the process of expansion to the forests was without difficulties. It was shown that "Despite the high diversity of species 'useful' plants are few" (Aceituno-Bocanegra and Castillo Espitía, 2005: 4). Quoting archaeological observations by Gnecco and ethnoarchaeological evidence provided by Politis, Scheinsohn sustains that "some researchers support the idea that… people created their own patches of resources in order to increase their effectiveness in the environment" (Scheinsohn, 2003: 345). This is true in general, of course, but it is probably not something that early explorers achieve immediately. On the basis of evidence collected at the Porce valley, Colombia, it was sustained the existence of early Holocene logistical camps "from which the hunter gatherers set out for other zones of the basin in order to obtain resources and information" (Aceituno-Bocanegra and Castillo Espitía, 2005: 5). On that basis it is claimed that the lower levels of those sites resulted from explorers occupying an unknown land. Certainly, the presence of stone axes, cutting and scraping tools and quern stones, and the low levels of disturbance of the forest support this claim. Some time for adaptation was required before hunter-gatherers possess the necessary knowledge and skills to modify their environment according to their needs, which in the case of the Porce valley included increasing diversity of lithic tools and the construction of stone floorings (Aceituno-Bocanegra and Castillo Espitía, 2005: 6).

One problem with forests is that plant-related information and non-organic resources, such as lithics, may have very low transferable value from habitat to habitat (Rockman, 2003: 19). This should have been especially pressing in environments such as the Amazon basin, where lithics are very scarce. Also, the lack of topographic relief makes navigation more difficult, retarding the process of learning the intricacies of the landscape (Kelly, 2003b: 49, 54). Moreover, hunter-gatherers cannot endanger themselves by collecting and consuming unknown wild plants. An extreme example is provided by the process of acquiring the knowledge to recognize and eventually process toxic plants, including for example *Lonchacarpus nicou* which was used to hunt fish in ethnographic times (Cárdenas and Politis, 2000: 59). It is expected that this plants are not incorporated early in the process of gathering information on the environment, and for some the use of toxic plants for subsistence signals the existence of some kind of stress (O'Connell and Allen, 2012).

In tropical forests, we have the important evidence obtained by Gnecco and Mora for the early Holocene (Gnecco and Mora, 1997; Gnecco, 2000). Sites San Isidro and Peña Roja, Colombia were occupied ca. 10,000-9000 BP, and the archaeological remains suggest a non-especialized extractive technology (Mora and Gnecco, 2003: 275), although the stone axes with side notches and the mortar-like stones of Peña Roja may indicate tree-falling and nut-cracking respectively (Oliver, 2008: 202), and "finely made stone hoes" are recorded at several early Holocene sites in NW South America (Piperno, 2011a:S460). The inhabitants of Peña Roja arrived before 9000 BP within a rain forest context. Some changes through time were recorded, including reductions in the abundance of charcoal "concomitant with the introduction of squashes (*Cucurbita* spp.)" (Mora and Gnecco, 2003: 276). Several species of palms with possible economic value are also recorded. The evidence at San Isidro, located at ~1600 m asl, clearly indicates that some previous knowledge of the area existed. More than 65000 lithic artifacts were found, suggesting that this place was redundantly used. The variety of raw materials, some of them from distant sources, indicates that formal exploration took place before the intense utilization of that place. In that sense, exploitation of "the very small, buried obsidian flows in the valley of Popayán/underscores/… a detailed territorial knowledge" (Gnecco, 2003a: 18). There is not a well preserved faunal record, but there are fascinating evidences of the consumption of a variety of plants – "charred seeds of *Persea* spp. and *Erythrina* and starch grains from *Xanthosoma*, *Ipomea*, *Manihot* and *Maranta* cf. *arundinacea*" (Aceituno et al., 2013: 27) – a list that can also be seen as an indication of a previous history of exploration of the local resources (Ichikawa et al., 2011). In this context, it is interesting to propose, like Mora and Gnecco do, that at sites such as these "foragers promoted the artificial concentration of useful plants across their territory. This farming-like behavior focused on species that required little planting or tending" (Mora and Gnecco, 2003: 282). However, evidence in support of this is difficult to find. The presence of pioneer species like *Plantago* and *Trema* in a context of

mature primary forest indicates human disturbance but, as admitted by Gnecco, "I cannot say whether this open space was naturally or humanly created" (Gnecco, 2003a: 14). There are also other evidences of early Holocene habitat transformation at the tropical forests of northwest Colombia (Gnecco and Aceituno, 2006: 93). Since the presence of humans is normally associated with disturbance (Odling-Smee et al., 2003), the evidences just presented are not necessary an indication of particularly complex interactions with the environment.

It is also argued that the presence of *Virola* in the pollen sample, which today is allopatric to the rest of the plants recorded at San Isidro, may have been transported from their original habitat (Gnecco, 2003a: 14). This is an expected situation for the Pleistocene–Holocene Transition times under the model of coevolutionary equilibrium (Graham and Lundelius, 1984), that predicts the existence of non-analog environments for the Late Pleistocene (see Gnecco, 2003b: 69).

The situation is slightly different for the Amazon basin. Beyond eating plants and insects, humans hunted a variety of animals including monkeys, peccaries, tapirs, and others and they are recorded in the archaeological record (Roosevelt et al., 1996; Politis, 1996a, 2001). These were all new species for foragers coming from non-forested habitats. Again, the ethology and distribution of these animals was to be learned in order to make adequate subsistence choices. Closer to the Atlantic coast, at Lagoa Santa, studies of the oral health of early Holocene human populations showed that during the early Holocene the diet was probably based on wild tubers and fruits (Da Gloria and Larsen, 2014). That early hunter-gatherers were advanced in the process of managing plant resources at the beginning of the Holocene is an interesting possibility, but it is not yet clear that they were the first explorers of those regions. Recent studies suggest that there is a strong possibility that the first hunter-gatherers in South America already had bottle gourds, probably used as containers (Erikson et al., 2005; Piperno, 2011a) and possibly other economically important plants (Piperno, 2006). Moreover, it is clear that the process of humanizing the South American environments began with the first explorers (Gnecco and Aceituno, 2006: 103), but it probably took some time to significantly transform them, before some demographic success was achieved. Importantly, in terms of the anthropic transformation of forested patches some knowledge is required to select the locations which are attractive enough to be settled and transformed. It probably took much travel to find the areas where burning of the forest is productive, returning was an interesting option, and human installation was desirable. In other words, the geography needs to be known before its systematic transformation fully starts.

What all this evidence clearly indicates, finding also strong support in the ethnoarchaeological work of Politis among the Nukak of Colombia, who unintentionally create patches of edible plants on abandoned camps (Politis and Gamble, 1994; Politis, 1996a, 1996b, 2007), is that the exploitation of the forest environments started very early (Roosevelt et al., 1996; Oliver, 2001; Politis, 2001). Accordingly, there is a good basis to presume that transformations of the forest are also early. This is independent of the fact that patches of edible plants can also be created in absence of human occupation (Cárdenas and Politis, 2000: 87–88). The mere presence of humans triggers habitat transformations (Lyman, 1995; Odling-Smee et al., 2003). The early presence of arrowroot (*Maranta* sp.) (Piperno, 1995), bottle gourd (Erikson et al., 2005), rhyzomes of *Calathea allouia* (Stothert et al., 2003; Piperno, 2009) and other plants in different places of South America (Piperno and Pearsall, 1998) is central in this discussion. Recently acquired knowledge about the human ways of exploiting forest resources derived from evolutionary ecology studies supports a discussion of the antiquity of these adaptations (Gragson, 1993). Also, the evidence for fires in the Amazon basin during much of the Holocene (Saldarriaga and Clark, 1986; Piperno, 1995), and for processes of deforestation associated with them (Bray, 1995), suggests that human management existed since early times (Stahl, 1996: 114). All these processes, however, must be adequately documented in relation with specific archaeological populations, acknowledging the existence of a previous process of humans entering a new environment with new resources, getting used to them, and finally learning the tactics associated with their management. David Rindos' coevolutionary theory might be relevant here, as it requires substantial time for the establishment of coevolutionary relationships between humans and plants (Rindos, 1984; Gnecco, 2000: 130; Gnecco and Aceituno, 2006: 92). However, Piperno does not believe that the protracted mutualism involved in the theory of Rindos can be defended, and instead she sustains that "long periods of experimentation with a fairly large and diverse set of species, especially those with similar life history and nutritional qualities, would not occur before the establishment of productive farming systems" (Piperno, 2006: 160). Whatever the outcome of these alternative positions, what is needed is a better knowledge of the point at which human populations display what Smith (2001) calls low-level food production systems. In order to achieve this we will also need well preserved faunal data from sites in forest contexts (see Piperno, 2006). However, what the existent archaeological record shows is "slowly unwinding reciprocal plant/human interactions" (Piperno, 2011a: S467).

Summing up, it is now generally accepted that the ranking of the forests as habitat for hunter-gatherers is not necessarily low (Politis and Gamble, 1994; Denham et al., 2009). Moreover, Piperno emphasized that "the single most important factor driving subsistence changes after the close of the Pleistocene probably was the dramatic decline in foraging return rates associated with the demise of glacial-period resources and expansion of forests into regions where open land vegetation had prevailed during glacial times" (Piperno, 2006: 152), which clearly offers an environmental context under which management of plants was to be expected. Taking a global point of view on hunter-gatherers living in forests, it is possible to say that they were able to rapidly "explore and take advantage of local forest resources" (Mercader, 2003: 17), in other words "to live there". However, by taking a closer look it becomes clear that probably it took several generations of people to adapt to the tropical forests of Colombia, Venezuela, and Brazil. Research in the Northwest of South America, plus a series of studies based on phytoliths are leading this archaeological quest. It is clear that a process of plant resource management was identified at the Pleistocene–Holocene Transition in South America (Stahl, 1996; Gnecco, 2000; Piperno and Stothert, 2003; Dillehay et al., 2007; Piperno, 2011b) and I believe that the process will be found to be not only more complex, but also older.

3.2. Non-utilitarian items and exchange

A few places in South America display early evidence of non-utilitarian artifacts. It is not yet clear if these are associated with an exploratory stage or if they signal the time when effective colonization was taking place. The examples recorded below might represent both situations. The examples include the early evidences of the use of ochre in the Pampas, Argentina (Scalise and Prado, 2006), a bone artifact with incisions at Cueva del Medio, Chile (Nami, 1994: 159), and a mastodon tusk with geometric designs at Taguatagua 2, Chile (Nuñez et al., 1994). Also, a possible pendant on a *Glossotherium* osteoderm at Santa Elina, Brazil (Vilhena Vialou, 1997-1998) and three perforated *Mylodon* osteoderms at Cueva de los Chingues, Chile (Martin, 2013) must be considered. It is not

yet clear to what point the selection of sites to live was associated with non-utilitarian considerations, but the available evidence establish that other concerns must be also taken into account. This information is interesting because at some point the so-called "non-utilitarian mobility" (Whallon, 2006) becomes important as a result of proto-exchange webs. The degree to which these systems developed into full exchange systems is open to question. The evidence to discuss this in depth is rarely published. In the few cases in which it is available, it points toward a low level of interaction between distant populations. A rarely considered alternative is that prehistoric populations were scattered and not necessarily very interconnected. It is becoming more important to discuss interactions during early times on the basis of specific archaeological markers, and I will present two examples. One example is provided by evidence recovered at site QJ-280 on south coastal Peru, dated between about 11,100 and 10,000 BP. These include tools and debris on petrified wood from a source located at least 20 km in the interior, an obsidian bifacial tool and debris from the Alca source, located between 2720 and 5165 masl, and seeds of *Opuntia* cf. *ficus-indica* from environments above 2400 masl (Sandweiss et al., 1998; Sandweiss and Rademaker, 2011: 284–286). Even if the mode of acquisition is not clear, the evidence clearly show the interaction between the highlands and the Peruvian coast during the Pleistocene–Holocene Transition. These results indicate a detailed knowledge of resources that were available on a variety of environments at different altitudes above the ocean.

Another example is offered by the archaeology of the Río de La Plata basin. In this case stone tool assemblages including Fell Cave projectile points dated between 11,000 and 10,000 BP were found in the Argentine pampas (Flegenheimer, 1986) and at Urupez, Uruguay dated between 10,600 and 11,600 BP (Meneghin, 2004; Nami, 2007, 2013). Those points were also found on surface contexts in both Argentina and Uruguay (Castiñeira et al., 2011). The same raw material was used for some tools, including Fell Cave projectile points, at both sides of the Rio de la Plata, and according to Flegenheimer et al. (2003) it was collected in Uruguay. Then, interaction across what is today the Río de La Plata basin occurred at such an early time, only that then it was a small river, known as Paleo-Paraná (Bracco et al., 2011). Also, the circulation during the Pleistocene–Holocene Transition of translucid rocks used for projectile points over distances 140–170 km was recorded (Suárez, 2011: 202). This panorama indicates that a detailed knowledge of the regional environment was probably in place ca. 10,000 BP (Flegenheimer et al., 2003: 61). Both examples, suggest that the process of exploration of those sectors of the Pacific and Atlantic coast respectively were known for quite some time before these well recorded interactions took place.

3.3. Empty lands

Other evidence of the long processes involved in colonization is the existence of lands which were not used at all, or only slightly used during the Holocene. We are not talking about places that lack systematic research, such as parts of the Caribbean lowlands of Colombia (Aceituno et al., 2013). Instead, we are referring to areas that in spite of those efforts are not characterized by an abundant archaeological record. We must never forget that South America probably was never fully saturated with people, an important property that our models must still recognize. Cases like those of southern Patagonia are good examples. In Santa Cruz, Argentina there is a large area almost devoid of archaeological materials located between two nodes of intensive prehistoric occupation (Borrero and Charlin, 2010). The limited evidence recovered in that area can be explained as the result of logistical use from one of those nodes, as a transit zone, or even as a buffer. The main point is that the area was probably uninhabited most of the time. On the other hand, work by Méndez et al. (2013) in Aysén, Chile noted the extremely low frequencies of archaeological remains in the Simpson basin. They entertained the idea of an area demarcating a limit between populations, but recognized that the evidence is insufficient to discuss it. The implications of very low population densities are clear. In both examples, archaeologists were at odds to explain the absence of an archaeological signal. In the end, it probably marks the existence of very few people with too much available land. As a result, it needs to be accepted that there are many places which were populated very late during the Holocene, such as many dead-end valleys near the Patagonian Cordillera (Borrero, 2004; Espinosa et al., 2009). In this context we are reminded of the Nukak conceptualization of space, in which there are places which are named but were not effectively occupied (Politis et al., 2003:18; Politis, 2007). In the case of some of the unoccupied lands by the Nukak, Politis notes that, "It is not clear if these unoccupied areas are the product of recent demographic decline or are simply the consequence of the traditional Nukak mode of land occupation" (Politis, 2006: 41). Some are places which the Nukak "have never or seldom actually visited" (Politis, 2006: 26). It is clear that the conceptualization of space which is not personally known exists among hunter-gatherers and we have no major reasons to think that things were too different at the end of the Pleistocene. On the contrary, all the available evidence for early settlers of South America indicates very low demographies. In other words, it is suggested here that the cultural geography of the early inhabitants of South America included extensive unoccupied lands, which were rarely visited, and that only with the passing of time was some continuity in the distribution of settlement achieved.

4. Conclusions

The process of the peopling of South America was probably slow and complex. Very little is known of the early stages of appropriation of the land, and adequate methodologies to recognize them should be refined. Sites attributable to an exploration stage are elusive, but not unknown, as the examples from Tierra del Fuego (Piana et al., 2012), Colombia (Aceituno-Bocanegra and Castillo Espitía, 2005), or the Andean mountains (Gil et al., 2011) show. It was perhaps noted that I have not relied exclusively on Late Pleistocene information or examples to discuss the peopling of South America. This results from the conviction that it is only by using the full archaeological record that we are going to understand this process. Not only there are many places which were for the first time visited by humans during the Holocene, but also some that were visited in earlier times were abandoned after that initial occupation and perhaps forgotten. This is a condition that opens the possibility of successive instances of colonization of the same lands (Franco, 2004).

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