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The process of human colonization of Southern South America: Migration, peopling and “The Archaeology of Place”



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ABSTRACT

This paper describes the significance and relevance of concepts presented by Lewis Binford in “The Archaeology of Place” (1982) in studying the process of human colonization in Patagonia. Models and observational techniques inspired by and presented in that seminal paper have been instrumental in the discussion of the mobility of the first inhabitants of southern Patagonia. The result is a flexible ecological model of a slow process of human expansion into the southern end of the continent, and the recognition of at least three early occupational nodes.

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1. Introduction

The study of the process of human colonization of new lands is as long as the history of archaeology. Effectively, the process of peopling of continents like America was among the first subjects to attract the attention of archaeologists and ethnographers (e.g. Holmes, 1918). In spite of this very long commitment and the tremendous amount and quantity of the accumulated data, the issues are still far from clear. One reason for this is that data without adequate frames of reference are next to useless, and the discussion of the peopling of America proves this. Dominant positions like “Clovis-first” or “Pre-Clovis” were discussed for years i.e. Fiedel, 2000), and it was observed that it was not sufficient to find a site older than 11,200 BP south of North America to settle the issue (Goebel, 1999). This information may solve the chronological side of the question, but it will be hardly relevant to understand the ways in which the peopling process operated.

The process of peopling is longer than previously speculated as indicated by strong information recently published for the period immediately after the Last Glacial Maximum in North America (i.e. Waters and Stafford, 2013). There are even older claims, most of which still require better formational and taphonomic support (i.e., Boëda et al., 2013). In any case, what we still need is a better understanding of the process of human colonization. Minimally, a discussion concerning its broader significance is required. In a sense this depends on what Binford calls the prior knowledge that the investigator brings to the discussion, since “observations are one thing, and what constitutes evidence for a given interpretation is quite another” (Binford, 1991a:275).

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2. Ethnography and human mobility

The mechanisms of colonization were usually discussed by appealing to the concept of migration (Martin, 1973; Greenberg et al., 1986; Mulligan and Kitchen, 2013). Migration alludes to permanent intentional or unintentional abandonment of a former territory (Kelly, 1992:45; Gamble, 1994:7). The discussion of these concepts was not central to most processual archaeologies, but some of the recent advances in the study of peopling processes can be traced to classic processual studies (i.e. Binford, 1982). Anthony mentions that “Migrants are not likely to move to areas about which they have no information” (Anthony, 1990:901), but clearly many times this was exactly the case. Indeed, migration or some sort of movement of people is required to explain the filling of previously unoccupied lands. Scouts probably were basic components of the process of human expansion, and their function was to acquire geographic and subsistence information.

Migration processes were mostly conceived at grand scales and were measured in hundreds or thousands of years (Anderson and Gillam, 2000; Surovell, 2000). These are the appropriate scales to discuss continental colonization, and they are useful to clarify some of the properties implicated by the peopling process, such as the need to adapt to a variety of contrasting habitats, or the conditions under which the movement would have been fast or slow (Gamble, 1994). On the other hand, the limitations posed by lack of knowledge about new resources or the need for social networks behind the success of colonization are subjects that need to be discussed at other scales. This is the point at which ethnographic information is extremely useful.

For example, ethnography has been especially informative for the understanding of the adaptations to cold required to colonize

Beringia (Nelson, 1969) as well as for the process of acquiring knowledge about new resources (Kelly, 2003; Meltzer, 2009). But rarely has ethnographic information about the ways in which humans expand into new lands been intensively used. Kelly notes the scarcity of information about “ethnographically known hunter-gatherers moving into terra incognita” (Kelly, 2003: 44). Most of the available information concerns movements into areas which were already occupied by other people, like the case of the Kutchin that “might decide to spend a season, a year, or more in the area of another tribe” (Nelson, 1973: 274). For that reason, it is very important to use whatever information is available.

The ethnographically and ethnohistorically well researched information provided by the 19th century Inuit displacement from Baffin Land to N.W. Greenland, (Freuchen, 1961; Mary-Rousselière, 2008 [1980]) is relevant here. This displacement indicates the importance of social causes for movement, since the reason behind the abandonment of Baffin Land appears to be “une histoire de meurtres et de vengeance” [a story of murder and revenge] (Mary-Rousselière, 2008 [1980]:30). This movement involved some 40–50 people and took years to complete, a period during which the Inuit had to deal with unknown territories and resources. They were even forced to scavenge “restes de phoques abandonnés sur la glace par les ours” [seal remains abandoned by bears on the ice] (Mary-Rousselière, 2008 [1980]:44).

The adventures of this group of Inuit constitute a “living” example of a situation in which “The facts of interest are the ways in which places are differentiated one from another, and how this differentiation is related to patterns of seasonal environmental dynamics” (Binford, 1982:28). Effectively, Baffin Land and N.W. Greenland differ in many important ways from each other, and all these differences required special attention on the part of the migrants. They moved during summer, they had to settle during winter, and they had to select resources according to this seasonal rhythm in accordance with the requirement of good information for “the most limiting time of the year” (Gamble, 1994:111). At the end of their journey, they made contact with the “Polar Eskimo” with whom they have communication problems. In the end, the migrants found that they did not fit in easily, reaching a point at which some of them decided to return to the homeland.

McGhee thought that this information could be useful to estimate hunter-gatherers’ migration rates, and calculated that a distance of some 1000 kms traveled in just three years was proof of fast movement (McGhee, 1997: 103). However, I do not think that his calculations took all relevant facts into account. It may have taken about three years to reach N.W. Greenland, but on their way they spent near five years at Devon island (McGhee, 2004: 234), and the distance that they had traveled up to that point was only about 150 kms (Mary-Rousselière, 2008 [1980]). After their arrival at Greenland, they settled for several years and, at some point, the group split up, with some people moving back. In sum, it took them about 10–12 years to move multi-directionally within a radius of some 700–1000 km.

Mobility is one concept that archaeologists often use, whose main properties are derived from ethnoarchaeological work. It concerns movements basically related with subsistence, but also with other human interests (Sellet, 2006; Politis, 2006; Whallon, 2006), including escaping from starvation (McGhee, 1997). Moreover, there is an organizational framework within which all these goals are interconnected. As Kelly says, “the ways people move exert strong influences on their culture and societies” (1992: 43).

Binford’s work among the Nunamiut developed useful information on mobility, economic zonation and annual ranges (1982–1983). The concept of territorial or long-term mobility, which refers to cyclical movements over a long period, perhaps a decade, is an important one (Binford, 1982; Kelly, 1992). The economic zonation offered by Binford is in part a development of concepts from the

Cambridge School of Paleoeconomy (Higgs and Vita-Finzi, 1972). Its main contribution to the discussion of places was in distinguishing the importance of foraging and logistical radii from a central hub, and archaeological implications at larger scales. Binford defined different modes of movement which he called, “half-radius continuous”, “complete-radius leapfrog” and “point-to-point” patterns. A description of the subsistence of people on the move, how they move, and the conditions under which they selected different modes of movement was a welcome addition to discussions at a microregional or location-specific scales. These discussions impacted the ways in which we currently discuss the past use of the landscape (Kelly, 1992), to the point that there are claims for example, that the archaeology of Australia is “basically an ‘archaeology of place’ in the sense Binford (1982) describes” (Smith, 2013: 13). Settlement began to be seen in terms of possible number of “moves per year”, and duration of use of places began to be measured in terms of the availability of fuel and food. Among other things, these concepts helped to further thinking about tactics that people use to explore and appropriate space (Surovell, 2000). The combination of the results of ethnoarchaeological research with the issue of acquisition of knowledge (see below) was adequate to produce fresh views on peopling processes.

3. The Archaeology of Place and colonization

Clearly, Binford did not write “The Archaeology of Place” as a study on colonization. Indeed, most of its utility is not related to that subject or even to his often-quoted concepts of economic zonation. Assemblage variability within and among places is the focus of the paper. However, some of the central concepts presented in that paper are important in clarifying colonization issues. For example, a variant of his “half-radius continuous pattern” appears to describe the kind of wave advance that people like Martin (1973) and others have in mind when proposing that America was populated by people advancing swiftly and extinguishing the megamammals at the same time.

Anyway, the concept of leapfrogging means different things to different authors. Anthony mentions that “great distances may be jumped and large areas bypassed through the agency of advance ‘scouts’ who collect information on social conditions” (Anthony, 1990:902). Then there is discontinuity in the use of space in Anthony’s leapfrogging, which is similar to what Binford calls the “Point-to Point” pattern. Both patterns should be archaeologically characterized by multimodal distributions of sites. The global record shows that there are places that were never colonized by hunter-gatherers, such as remote islands, or plateaus and other highlands that were ignored or just traversed (Charlin et al., 2011; Méndez et al., 2013). In other words, humans select where to go and where to stay. In the long-run, demographic, environmental and social reasons may accelerate or retard the process for decades or even centuries. Most certainly this is the reason why – together with taphonomic bias – so many spatial and temporal discontinuities are observed in the archaeological record.

Thus, evidence for spatial discontinuity is not necessarily related to difficulty of human colonization. We can safely assume that most of the required survival strategies and tactics were available for the first *Homo sapiens* exploring the Americas (Borrero, 2011). What ethnography teaches us is that organizational issues are always involved in the explanation of these spatial gaps. They have more to do with demography and human selection of attractive places for initial settlement than anything else. In sum, it can be asserted that there was a ranking of environmental patches or habitats (Borrero, 1989; Beaton, 1991; Politis, 2006), and that people made decisions about where and how to move based on a number of criteria. In a world without neighbors it is possible that productivity is the main reason to select places to stay (Anderson

et al., 2013), but once the process of human expansion started alternative or additional criteria also apply.

In discussing the case of the radial pattern with home bases and satellite camps attributed to the Natufian, Olszewski highlights one of the archaeological implications of one of Binford's patterns. She maintains that, given that contemporaneity between sites is difficult to demonstrate, recorded settlement patterns "may not represent territories in the sense of bounded units/but/something akin to what Binford (1982: 9) has called "complete-radius leapfrogging", in which, given enough time, one or a few groups are responsible for many/all of the radial patterns in a certain geographical range" (Olszewski, 1991:329). Also, Beaton's model of Early Settlers and Transient Explorers present vivid descriptions of human decision-making at small spatial scales, with the result that "the estate would come to be configured as a landscape of camps, foraging grounds, and other special places" (Beaton, 1991: 223). This characterization is very similar to that envisaged by Olszewski (1991) for the Natufian, and also fit descriptions of the peopling of Patagonia (Borrero, 1989). In other words, slow expansion of people in the long run may fill much space, therefore constituting a valid model of expansion. Beaton also discuss what he calls "Transient Explorers", who move quickly. At the moment this mode of movement does not appear to accommodate the available evidence for the peopling of America, South America, or more specifically, Patagonia.

In their model for colonization of America, Anderson and Gillam (2000) considered two modes of movement, called the "String of Pearls" and the "Leap-frog" models. The first consist of circular territories and proceed by fissioning and displacement into additional territories. Leap-frog movements (*sensu* Anthony) assume movements of appreciable distances. Anderson and Gillam (2000:47) explain that: "... awareness of what lay ahead cannot be assumed". It can be argued that the well known "leap-frog" pattern – useful for movement to distant places – does not apply in the process of exploration of diverse environments since it requires the existence of previous knowledge (Rockman, 2009:55). This is also implicit in Binford's definition of "Point-to Point", since the "placement of camps under such an organization is always an accommodation to a prior understanding of resource distribution" (Binford, 1982: 11). This pattern may apply whenever homogeneous habitats were explored. In other words, it may be useful at the scale of the megapatch (*sensu* Beaton, 1991). Since mobility is "a byproduct of strategic articulations between the structure of the habitat and the demand for resources" (Binford, 2001:255), it is no wonder that the velocity of new settlement slows down whenever new habitats are reached.

Beyond the particulars of these examples, the applications are interesting and operative at different time scales. Olszewski's application, while functioning at a strict archaeological scale, still says something about the functioning of people on a landscape. Variants of that application – similar to territorial mobility – can also be used to explain large-scale peopling of land masses. In spite of Anthony's opinion that short-distance migration should not apply to understanding long-distance migration like the colonization of America (Anthony, 1990:90), it really constitutes the best way to understand colonization in multi-generational time. Complete-radius leapfrogging (*sensu* Binford, 1982) is a way to incorporate neighboring places at which most of the resources will not differ significantly from those already known (e.g. Kelly and Todd, 1988).

As already mentioned, the concept of megapatch as envisioned by Beaton (1991: 220) is central to the feasibility of successful colonizations. Movement within a megapatch allows for successful, more-or-less continuous, displacement. On the contrary, incursions into new megapatches are occasions where the velocity of colonization should have been at its lowest. Those were the times when new knowledge was required, since a shifting of resources was taking place. The process of learning the local ecological cycles

and distribution of resources takes some time, and scouting new lands requires well-connected social networks for the transmission of information (Lovis et al., 2005; Whallon, 2006; Whallon et al., 2011). This slow, continuous advance may produce the colonization of a continent in the long run. In the end, these are powerful tools to discuss the colonization of new lands. The point is that Binford's scheme of economic zonation explains that, as a simple result of people regularly occupying annual ranges, the filling of new territories may be the result. When people are moving near unoccupied territory, minimal changes about where to camp next, or where to hunt, begin to fill in space. This is basically a non-directional process that only takes advantage of the most suitable neighboring environments (Borrero, 1989).

4. Acquisition of knowledge

The use of different strategies can result in different velocities of movement or different propensities for colonization. Goebel (1999) suggested the use of subsistence strategies in Beringia in which technologically mediated risk reduction, together with "a reliance on familiarity with local terrain ... would not be conducive to rapid expansion" (Bettinger and Young, 2004:243), while "logistical mobility would provide a more rapid way to acquire landscape knowledge" (Kelly, 2003:54). At the same time that logistic exploitation is turning the landscape into a known resource, the velocity of advance is reduced. As Meltzer puts it, "Colonizers had to balance the equation between moving to explore and staying to observe" (Meltzer, 2009: 253).

These patterns refer to Extended Ranges (Binford, 1983: 381) in which new hunting grounds or lithic sources are sought (Binford, 1991b). They refer to practical decisions made by people during the time in which they are familiarizing themselves with new land. More sophisticated technologies are required by some new habitats, but increasing knowledge of the "how-to", which is always knowledge relative to specific environments is crucial to make these decisions. Long distances measured by the distribution of exotic resources were considered as the result of "annual ranges or regular patterns of movement but also to some extent, the colonization of new areas" (Ellis, 2011:392). It is the study of how hunter-gatherers acquire knowledge about large areas that leads us to understand how land is explored and colonized (Lovis et al., 2005).

The role played by the acquisition of knowledge in all these models cannot be overemphasized. Meltzer quotes Binford concerning the role of knowledge: "Insurance for hunter-gatherers ... is knowing where to go next, when things go bad where they are currently" (Meltzer, 2004:377). Scouting and an adequate flow of information are requisites for a successful colonization plan.

The acquisition of knowledge about new land and resources was only recently systematically researched (Borrero, 1994–95; Franco, 2002; Rockman and Steele, 2003; Meltzer, 2009; Rockman, 2009). People have to interact with new patterns of rock, animal and plant distribution. Trial and error tactics were probably used. These are expensive tactics, but it is difficult to be conservative when you are exploring new lands. Beyond knowing how to get an adequate input of food, fuel and raw materials, measures to avoid danger and getting lost have to be taken (Nelson, 1969). All in all, under these conditions the velocity of the expansion could not be very fast.

5. The colonization of Patagonia

Most interpretations of the colonization of Patagonia have alluded to one form or another of long-distance migration (Bórmida, 1953-1954). In trying to make sense of the human exploration and colonization of this huge region, Borrero considered people that spread slowly progressively filling all the available or

attractive space (Borrero, 1999). On the basis of ethnographic sources about the way in which the mobility of hunter-gatherers operates (Nelson, 1973; Binford, 1982; Kelly, 1992, 2013) this process “should not be viewed as a constant southward movement. Instead a slow multi-directional flow of people should be considered” (Borrero, 1989:258). Generalized diets are expected, and the archaeological implications for lithic tools were specified in Franco (2002). No differentiation in the organization of interior space was recorded, a condition expected under high residential mobility (see Schmader and Graham, 2015).

As to reasons for movement, it was offered that “the gradual extension of hunting ranges and the splitting of bands into new smaller units must have been causes for movement” (Borrero, 1989:258), but other reasons can be considered as well (Mary-Rousselière, 2008 [1980]). Descriptions of the mobility of hunter-gatherers like those presented by Binford can be used to characterize this model. He contends that environmental changes may prompt exploration of “previously avoided areas” (Binford, 2001:454), and gives the example of the Nunamiut whose reaction to problems in the availability of caribou is to split up into search parties “who went on long trips to look for caribou. Some of these trips lasted over eighteen months” (Binford, 2001:490). This is an extreme example of long-distance logistic mobility (Lovis et al., 2005) that has the collateral result of exploration of large ranges and the acquisition of geographical knowledge, allowing for the fission of groups “into new areas”.

In this paper I am not discussing in any detail the archaeological record of Patagonia, except to say that several archaeological locations in Patagonia are characterized by an abundance of early human occupations dated approximately between 11,500 and 10,000 ¹⁴C years ago (Borrero and Manzi, 2007). The early occupational nodes of continental Patagonia were located in the central plateau of the Deseado basin (Miotti, 1998; Paunero, 2003), the Pali-Aike Volcanic Field (Bird, 1988; Martin, 2013), and Ultima Esperanza (Nami, 1987; Martin, 2013). All are high-ranked patches where rockshelters, lithic sources and other subsistence items are abundant. Evidence of the exploitation of extinct and modern large mammals was found at most of these sites. The larger prey, like extinct horses (*Hippidion saldiasi*) or guanacos (*Lama guanicoe*) is not migratory, a condition that goes well with short residential moves within the annual home range. No differentiation in the organization of interior space was recorded, a condition expected under high residential mobility (see Schmader and Graham, 2015).

These places constitute what Binford calls Core Areas (1983: 380), and resemble what Anderson calls staging areas: places selected whenever “resource-rich areas were encountered, ... occupied for extended periods, and in some cases settled permanently” (Anderson, 1995: 5; Anderson et al., 2013: 196). They were places heavily traveled with long-term mobility (Kelly, 1992) at the beginning of their use histories, thus attaining a degree of archaeological visibility (see Kuhn and Clark, 2015).

These locations are separated by considerable distances, on the order of hundreds of kilometers. We may ask if this discontinuity is the evidence expected from the operation of leapfrogging, as suggested by Anthony when he asserts that “the archaeological pattern produced by leapfrogging should resemble ‘islands’ of settlement in desirable or attractive locations” (Anthony, 1990: 903). The answer is negative, since the temporal scale of each node is longer than 1000 ¹⁴C years, suggesting they were staging areas, localities where people was installed for several centuries. In those places the locally abundant excellent-quality lithic raw material was used, there are evidences of tool resharpening, and the study of faunal remains suggests local exploitation conforming to a generalized adaptation. This long-term concentration of activities within the catchment of one or more sites can be used to argue against the idea that the first inhabitants of Patagonia were moving fast.

If we move beyond these core areas, the oldest archaeological evidence of well-researched habitats located nearby these staging areas is usually early Holocene or Final Pleistocene in age, and the lithic raw materials are of inferior quality (Aguerre, 1987; Franco and Borrero, 2003; Borrero, 2004; Otaola and Franco 2008; Franco et al., 2012). These patterns appears to be better explained as the visible portion of a more continuous record in which sites located in intermediate lower-ranking places are less abundant and perhaps – as a result of less intense occupation – also less visible compared to the mentioned high-ranking places. Any evidence of repetitive human occupation of specific sites is not older than early Holocene. To understand the use of this intermediate large geographic space it must remain clear that there are places that were only used to circulate – transient places – and also places that were avoided.

The early occupational nodes were special places within a wider landscape, places selected for settlement because they offered resources that recently acquired knowledge considered to be abundant, attractive or simply sufficient. These locations were not the visible result of leapfrogging through Patagonian space, but from careful selection of adequate places for early settlement. Their highly discontinuous distribution in Patagonian space was probably instrumental in propagating founder effects, whose results are observed in the subsequent largely divergent mid-Holocene occupational history at each of these nodes. Only during the Late Holocene, when human demography reached higher levels, is there some degree of spatial homogeneity in southern Patagonia.

6. Conclusion

Although colonization was not the subject of *The Archaeology of Place*, its emphasis on economic zonation and hunter-gatherer patterns of displacement as well as the archaeological consequences of “the basic organizational properties of mobile human adaptation” (Binford, 1982: 28) have advanced our understanding of colonization problems. This impact is not always explicitly acknowledged, but has still been essential in the generation of slow-moving models of colonization. Moreover, the different modes of movement described by Binford played an important role both in suggesting and discussing alternative colonization modes. In fact, it would have been difficult to provide an interpretation of the early archaeological record of Patagonia without the solid framework provided by the work started by Binford in 1982.

The exploration of Patagonia has been particularly seen as a series of slow movements into unfamiliar territory, following routes of least effort with non-optimal use of places (Borrero, 1989). The selection of places to settle suggests the existence of a ranking of habitats and the resultant preference for some localities. The study of early human occupations at those separated habitats attests to the presence of archaeological discontinuities at a regional scale. Displacement modes similar to what Binford called “complete-radius leapfrog” pattern – which in the long term translates into territorial long-term mobility – appear to be the best way to understand the process. Together with the concept of staging areas, places “from which the exploration and settlement of the rest of the region could have occurred” (Anderson et al., 2013:196), these displacement modes provide a better explanation of the process of human exploration of Patagonia than the recourse to “Point-to-Point” or other putative fast modes of movement.

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