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EARLY INHABITANTS AND SETTLEMENT

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The character and context of highland preceramic society

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Any discussion of preceramic Andean cultures must define its limits. A strict consideration of totally non-food-producing societies would leave aside the great majority of preceramic remains from the Peruvian highlands. While the earliest human arrivals in this area may not have brought important domesticated plants and animals, domesticates do show up shortly after their arrival. In a more realistic vein, this chapter considers societies organized around relatively small residential groups, perhaps in the 20–50 person range, that subsisted mainly on wild foods, and probably had relatively egalitarian relations.

This isolates a Non-Complex Preceramic, which excludes large sites such as Kotosh (Izumi and Terada 1972) and complex preceramic evidence in or near the Callejón de Huaylas (Burger and Burger 1980, Bueno Mendoza and Grieder 1979). These sites show evidence of elaborate ceremonialism, probably involving a specialized and status-differentiated society. While these developments are underway by at least 2500 BC, a more traditional, small-group and egalitarian existence continued in other Andean areas.

The environment, character, and adaptation of these societies in the Peruvian highlands will be the focus of this chapter. In keeping with current trends in the study of prehistoric hunter-gatherers, I will avoid extensive comparisons of chronologies, stone tools and other artifacts, and instead examine socio-cultural adaptations to the specific environmental conditions of the highland Central Andes.

Since different adaptations were evolving at varying speeds in contrasting highland ecological situations, wide-ranging chronologies such as those of Lanning (1967a) and MacNeish, Patterson, and Browman (1975) are of limited use here. Rather than describe preceramic archaeological remains from all known phases in all known areas, I will make general observations about two broad periods: an early glacial period, prior to 9000 BC, and a postglacial preceramic of 9000 to 1800 BC.

HIGHLAND ENVIRONMENTS AND PALEOENVIRONMENTS

Natural resource characteristics, such as seasonality, behavior and distribution, greatly influence hunter-gatherer adaptation. This is in contrast to

Fig. 1.1 Major preceramic sites mentioned in the text, and three important zones of preceramic investigation.

advanced food-producing societies with storage facilities, which are capable of altering ecosystems to their advantage and storing foods across seasonal gaps in availability. Since highland preceramic cultures depended mostly on wild foods, the Andean ecosystem provides an important foundation for our consideration of these early peoples.

Evidence of human occupation in Peru may be 20,000 years old, so the significant climatic changes at the end of the Pleistocene are of concern. In the highly altitude-stratified Andean environment, any change in temperature or rainfall would have shifted present zones upwards or downwards. Such changes in resource distribution have serious implications for hunter-gatherer occupation. Pleistocene ice cover over large areas of the Andes, potentially limiting or eliminating highland occupation, represents an even greater impact (Lynch 1980: 311, Hester 1973). To cover these possibilities I will briefly describe the modern highland environment, and then review evidence for climate change.

Modern environment

Crossing the Andes chain from east to west anywhere in Peru, zones are highly stratified in synchrony with the steep altitude gradients. Starting at the top of the Andes and moving down, we can recognize the snow and periglacial zone, the puna zone, and below this the highland valley macrozone, an internally complex biotic area. Still lower is the lush tropical vegetation to the east of the Andes, and a contrasting riparian-xerophytic-littoral-fog-meadow complex along the western coastline – but these areas are beyond the geographic range of this discussion.

Snow and periglacial zone. As the name implies, this very high altitude wasteland above 5,000 m is either covered by permanent ice and snow, or seasonally frozen or snow-covered. The very limited range of resources, low biomass, and rugged topography make this zone of dubious value for human subsistence.

Puna zone. This is the highest area fit for human occupation, consisting of rolling grasslands spotted with flat lakeshore plains and crossed by a network of perennial streams (Fig. 1.2). The altitude range of the puna, from about 3,900 to 5,000 m, has rather little effect on puna ecology, especially in central Peru. More significant are moisture-retention and heat-protection differences due to a variety of topographical, ground-water, and bedrock-exposure conditions. In general, the puna is best considered a fine-grained mosaic environment, which contains scattered plant resources such as berries, tubers, and seeds, but with ideal grassland areas for grazing of abundant wild camelids (Fig. 1.3) and deer. Lakeshore areas may have been productive for waterfowl, aquatic plants, and amphibians.

The puna, like all highland environments, varies considerably between northern and southern Peru. In the north the puna is largely lacking, due to heavy erosional dissection of the Andes (Fig. 1.4). Central Peru has a large puna girdle at about 11° S latitude. This expanse is surprisingly non-seasonal, varying more in precipitation than temperature between the wet (November–April) and dry (May–October) seasons. Modern puna herders maintain their grazing animals the year round on the same pastures, since the grasses are productive across the seasons. In far southern Peru the snowline is higher, and there is a greater contrast between wet and dry seasons. Nevertheless, the vicuña, a camelid which needs year-round productive territories, are as at home as they are in the central puna.

The puna of southern Peru has been described as an unpredictable environment with reference to modern herder-agriculturalists (Winterhalder and Thomas 1978). Given their reliance on domestic plants and animals not totally adapted to the zone, this is a reasonable view. But for much of the central puna's natural food sources, predictability may have been rather high with a

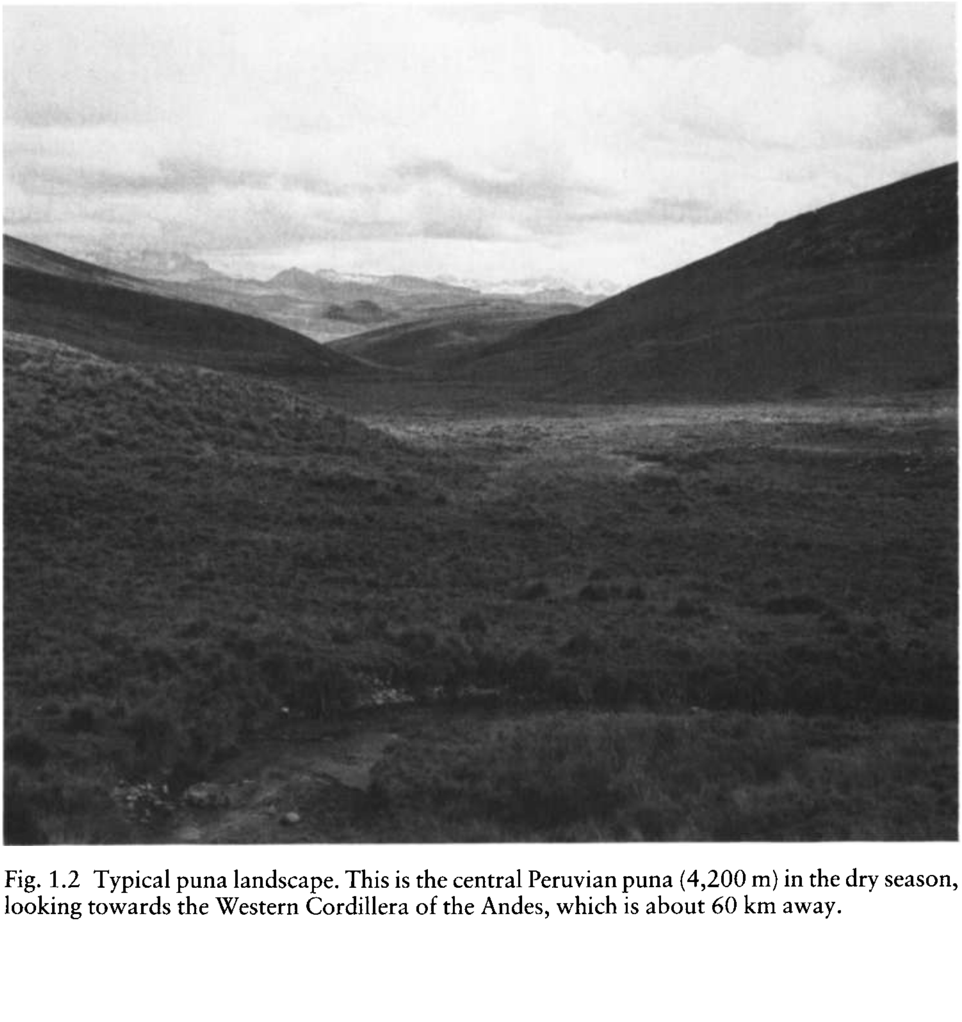

Fig. 1.2 Typical puna landscape. This is the central Peruvian puna (4,200 m) in the dry season, looking towards the Western Cordillera of the Andes, which is about 60 km away.

medium overall resource density, without strong spatial or seasonal aggregation. The puna's fine-grain mosaic resource distribution and lack of pronounced seasons give relatively even resource availability across space and time. The frigid climate of this altitude limits the growth of leafy and herbaceous plants, permitting grasses and grazing animals to take a front seat in the human resource arena (see Cardich 1976). A possible exception to this dispersion are the lakeshores, where ameliorated temperature regimes allow concentration of waterplants and waterfowl.

Highland valley macrozone. The highland valley's highly stratified ecology is strongly influenced by altitude, and even more by rainfall (Fig. 1.5). A pan-Andean view of the highland valleys must consider more than altitude, since rainshadow areas are highly distinct from more moist environments of the same altitude. In such a water-limited situation, major watercourses are of great importance. The relatively drier condition of the highland valleys accentuates the contrasts between wet and dry seasons, highly affecting productivity across the yearly cycle. Lack of perennial grazing or browsing resources would have led to a much lower density of large game than the puna offered. Because of their own storage needs, and because of the freedom from heavy frosts, valley plants would have been more productive, but seasonal, resources for hunter-gatherers.

Fig. 1.3 Band of vicuña in the punas of Junín, 4,200 m altitude. These deer-sized wild camelids were an important, non-seasonal resource to early hunters of the high grasslands.

A reconstruction of the biotic resources characterizing the modern highland valleys is hampered by the great environmental modification of two or three millenia of intensive agriculture. Many forests, in particular, were removed long ago by field clearing and firewood collection.

Microzones present in most highland valleys would be 1) narrow riparian corridors following major streams, with low trees, shrub vegetation, and some herbaceous growth; 2) barren xerophytic areas away from streams at lower altitudes and in rainshadows; and 3) increasingly more abundant shrubby and

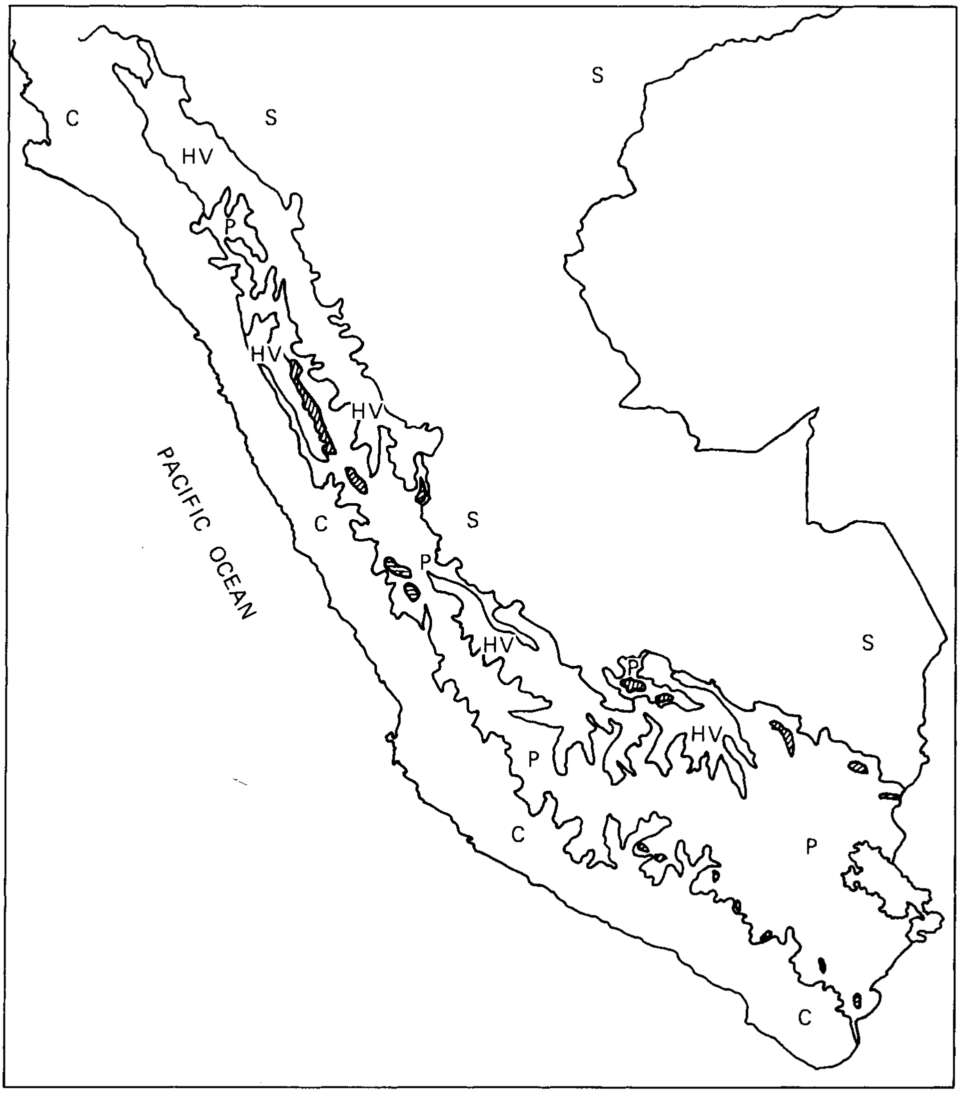

Fig. 1.4 Map of Peru, showing the approximate area of coastal (C), puna (P), highland valleys (HV), and the selva or jungle area (S). Hatched zones are the major snow and periglacial areas. Compiled from pp. 143, 175 of Instituto Nacional de Planificacion (1969).

thorn-forest vegetation as a level of 3,600 m is reached, above which the trees and shrubs thin to puna grassland. For technical reasons, terms such as "humid" and "forest" have appeared in environmental classifications of Peru (see Tosi 1960). These are not, however, the moisture levels or tree growth the average person might envision. Even "humid" areas have less than 500 mm of highly seasonal rainfall. "Forests" were mostly of low-standing, spiny trees (see esp. Smith 1980b).

In sum, highland valley areas show significant seasonality, with seasonal desiccation of lower zones and, to a lesser degree, of the higher valley areas. During dry seasons, resources would have concentrated around water sources, much as in the Kalahari desert, as animals sought out remaining green vegetation. Wet-season conditions would encourage the dispersal of food resources, with lower areas becoming relatively more productive. Resources therefore probably ranged from somewhat aggregated to quite dispersed, and density probably was low in terms of overall biomass compared to the puna. Predictability was rather low; any rainfall variation would have a striking

Fig. 1.5 Highland valley scene. This view looks eastward from the mouth of Pikimachay Cave (Ayacucho), towards higher, more vegetated zones.

effect on vegetation and game movements, since the environment is water-limited to begin with.

It is worth while to evaluate the relative surface area included in these zones. Most investigators have viewed the puna as a fringe which rings the allegedly more important highland valleys. This may in part reflect the prevalence of modern population centers in highland valleys rather than in the puna. However, using Tosi's (1960) ecological zonation for Peru, which includes the huge expanses of low eastern tropical vegetation (58% of Peru), zones assignable to the puna total 14.1% of Peru, while a liberal estimate of highland valleys is 11.4%. This large proportion of puna is further compounded, since the northern third of Peru has no puna at all – making the lower two-thirds of the country very puna-rich indeed (Fig. 1.4). This suggests a zone that is more than just an upper valley edge, but rather one of greater area, of large, unbroken extensions, and of greater natural resource productivity than highland valleys.

Environmental change

There is little reliable information from highland Peru concerning climates of the recent past. Most studies have relied upon the more solid records from outside Peru, including Van Der Hammen's Quaternary Project in Colombia (1973), Heusser's Chilean pollen record (1966), or Mercer's Patagonian glacial evidence (1972). Changes in such distant locations cannot be assumed to have occurred in Peru, especially if they represent minor trends. Peru itself has a few studies of glacial stages and snowline depression, one non-archaeological pollen study just completed, and a smattering of archaeological pollen, plant, and animal remains studied in on-site contexts.

The best-documented evidence is of snowline depression and major climate change during the last stadial of the Pleistocene. Human occupation in the sierra might have been restricted by ice cover at this time, according to Hester (1973) and Lynch (1980). A number of studies examine snowline depression for the Pleistocene (Clapperton 1972, Hastenrath 1967, Nogami 1976), but there is little assurance that these studies document the latest, as opposed to earlier Pleistocene, advances. Wright (1980) suggested, on the basis of field studies coupled with carbon dates, that the last major ice advance in central Peru occurred around 12,000 BP, and involved a 300–500 m lowering of snowline. A more recent series of dates from the same area now suggest termination of glacial conditions by at least 13,000 BP (Wright, personal communication). During this last major glacial advance, ice may have descended to 4,600–4,500 m altitude, according to Wright (1980). Hastenrath (1967) documents a Pleistocene glaciation as low as 3,700 m in northern Peru, and 4,300 in the central area. But, as mentioned above, the lowest glaciations may have preceded human occupation.

The more conservative estimates suggest that most of the Peruvian sierra was not recently under ice. Even parts of the puna of central Peru were ice-free in the last advance. While it was more frigid and less productive than at present, it still may have been inhabitable. Highland valleys would have been quite productive, perhaps reflecting somewhat higher life zones than they do today. A depression of ecological zones seems probable, given the 2° C temperature drop and greater precipitation that Wright (1980) uses to explain snowline depression. Cardich (1964) presents a moraine sequence from the Lauricocha puna, which he correlates with known Pleistocene sequences elsewhere. However, independent dating is lacking to support these correlations.

Records from outside Peru have varying dates for the end of Pleistocene glaciation, but all agree that most areas were ice free by 12,000–10,000 BP. No glaciers or climate changes of Pleistocene magnitude are found after this date. A few small, undated advances are known from Junín, indicating short periods of colder/wetter climate (Wright 1980, 1984). Times of greater warmth than the present day have been mentioned for areas outside Peru by Gonzalez, Van Der Hammen, and Flint (1965) and others. But from within Peru itself, the most convincing evidence to date for postglacial climate comes from a deep, carbon-dated pollen core retrieved by H. E. Wright, Jr, and his colleagues from Lake Junín (Hansen, Wright, and Bradbury 1984). The pollen stratigraphy implies that east Andean forests were lowered in elevation or reduced in density during the last glacial maximum. The Holocene record shows uniform climate and vegetational conditions, broken some time after 3,000 years ago by an advance of local glaciers. This post-preceramic ice began a final retreat before 1,100 years ago. Therefore, after the retreat of Pleistocene glaciation, there is little evidence for changing highland climate during the preceramic period.

Other evidence for postglacial climate is based mostly on archaeological assemblages. Implicit in archaeological data is the human role in the accumulation of pollen, and plant and animal remains. Kautz (1980) clearly shows that much of the pollen record for Guitarrero Cave in the Callejón de Huaylas is a result of human contributions. MacNeish *et al.* (1980) reconstruct environments on the basis of animal remains from archaeological levels, although admitting that the various climatological data from this project are not in agreement. For Smith (1980a) the abundant plant remains from Guitarrero Cave speak for a rather constant plant environment after about 8000 BP, and Pearsall's (1980) extensive carbonized plant identifications from Pachamachay Cave in the Junín puna show no significant quantities of non-puna species since 12,000 BP, and no trends suggestive of climate change.

None of these records argues for a totally constant climate, but, in conjunction with pollen evidence, it seems safe to suggest that no radical changes capable of substantially altering subsistence patterns occurred in postglacial preceramic times. Glacial periods would have seen zone depression, but no total elimination of major zones for human habitation.