

MIDDLE PRECERAMIC HOUSEHOLD, RITUAL, AND TECHNOLOGY IN NORTHERN PERU

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ABSTRACT

This paper discusses the archaeological and paleoecological data for the first people to enter the Zaña Valley and their later development as sedentary horticulturalists. The technical, social and economic implications of these developments in regard to forming the foundations of early Andean civilization are also presented for the Early (ca. 10000-7500 b.p.) and Middle (ca. 7500-5000 b.p.) Preceramic Periods. We discuss the Paijan, Nanchoc, Pircas and Tierra Blanca cultures in terms of their settlement patterns, bifacial and unifacial lithic technologies, economies, and social organization. The most important site complex is the Nanchoc Mound site, dated between 7200-5000 years ago, where lime seems to have been produced in a separate ritual space for consumption with coca leaves. The broader implications of these cultural transformations are discussed with respect to the importance of the Middle Preceramic period for understanding the beginnings of central Andean civilization.

Key words: Peru, Archaic Period, tropical forest, prehispanic cultigens, ritual technology.

RESUMEN

Se presenta un análisis arqueológico y paleoambiental de los primeros pobladores prehistóricos en el Valle de Zaña y las siguientes etapas de desarrollo técnico y económico hacia la vida sedentaria y eventualmente la formación de la base de la civilización andina en la zona desde el Período Precerámico Temprano (ca. 10000-7500 a.p.) al Período Precerámico Medio (ca. 7500-5000 a.p.). Más específicamente, se discuten las culturas de Paijan, Nanchoc, Pircas y Tierra Blanca en términos de los patrones de asentamientos, las tecnologías líticas bifaciales y unifaciales y sus funciones espaciales y temporales, y la organización social. El más importante conjunto de sitios precerámicos corresponde al yacimiento de los Montículos de Nanchoc, fechado entre 7200 y 5000 a.p. y su relación a la producción de cal, en un asociado espacio "ritual", para el consumo de coca. Las implicancias más amplias de estos cambios y procesos locales son discutidos en cuanto al valor histórico y científico del Período Precerámico Medio para el entendimiento de la base socio-cultural de las sociedades complejas en los Andes Centrales.

Palabras claves: Perú, arcaico, bosque tropical, cultivos prehispánicos, tecnología ritual.

Human history is about adaptation to changing environments, social relations, access to power, and the increased growth of collectivities in the form of culturally identifiable communities. Cultural identity and a sense of shared purpose has always binded people together and given them power as a society. Anthropologists have identified several ways to establish and sustain identity, including material culture, burial practices, the development of local resources for trade and exchange, the invention of technology, and public rituals of solidarity held at permanent ceremonial places. It is no coincidence that in each part of the world where preindustrial civilizations appeared, ceremonial places were the first seats of power exchange, authority, and identity. Participation in rituals at these places enhanced the sense of group identity, coordinated the actions of the individual members of the group, and prepared the group for immediate or future cooperative action. Certain favorable environments also played a significant part in the rise of civilization but the final importance must be

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Recibido: julio 1996

Aceptado: octubre 1999

given to the nature of social relations between and within communities in such environments and to the ritually sponsored activities among them.

The Central Andes is one of the few places in the world where the emergence of civilization was an indigenous, autonomous process of development. Most Andeanists agree that the first great culture was Chavin (Burger 1993), which developed around 1000 b.C. and was characterized by a dominant art style and architecture that influenced later cultures. Yet it is important to realize that prior to the emergence of Chavin culture many Andean communities already exhibited monumental architecture, urban populations, incipient irrigation farming, long distance exchange, craft specialization, elaborate art, and mechanisms for the regulation of both production and distribution of resources. Sometime between ca. 3200 and 1800 b.C., during the Late Preceramic and Early Initial periods in Peru and Ecuador, large public buildings suddenly appeared with local small scale communities.

The important events leading up to these evolving cultural developments are little known. It is the Middle Preceramic hunting gathering period, between 6000 and 3000 b.C., which is important for revealing a series of technological, economic, and probably ritual events that characterize the forms of social relations that provided the base institutions for later societal complexity. As Michael Moseley (1993) of the University of Florida and Peter Kaulicke (1994) of the Universidad Católica de Peru have noted, it is within these early hunter gatherer societies that we can legitimately seek the initial moves towards domestication, sedentism, technological innovation, occupational specialization, the construction of public architecture, and complex society in general.

Most anthropological explanations for the rise of social complexity identify four critical variables: demographic change, subsistence intensification, sedentism, and storage economies. The most common model views population growth and intensified subsistence strategies as primary movers that result in the reduction of home ranges and the emergence of sedentary communities and storage economies. The subsequent advent of high population densities and the resulting social circumscription of communities across the landscape, in which population fission is no longer a viable option, provide the necessary conditions for socio political hierarchies to evolve. Under these conditions, it has been argued that aspiring elites could maintain control of key resources through exchange, warfare, and ownership of property. In the Central Andes, this may not have always been the case, because religious development, the appropriation of a central public place for cultural identity and inter group activity, technological innovation, and the development of diverse societies across a mosaic of extremely varied and juxtaposed environments may have played equally important roles.

We report here on a Middle Preceramic hunter gatherer society that thrived in a highly localized tropical environment of the upper Zaña Valley of northern Peru (Figure 1). This population apparently took important initial steps toward societal complexity by constructing two small scale earthen mounds suggestive of incipient corporate unity and group identity, acquiring exotic resources from distant lands, possibly developing a ritually related technology to produce lime for use with coca leaves, and treating their dead differently. An understanding of these steps may provide insights into the early principles of societal organization and civilization.

ENVIRONMENTAL SETTING AND SITE PATTERNS

As our previous work in the area has shown, the Zaña Valley is characterized by a series of branching, lateral canyons and alluvial fans which contain access routes to a tropical forest above and to an arid middle valley and coastal plain below. The Preceramic sites are located

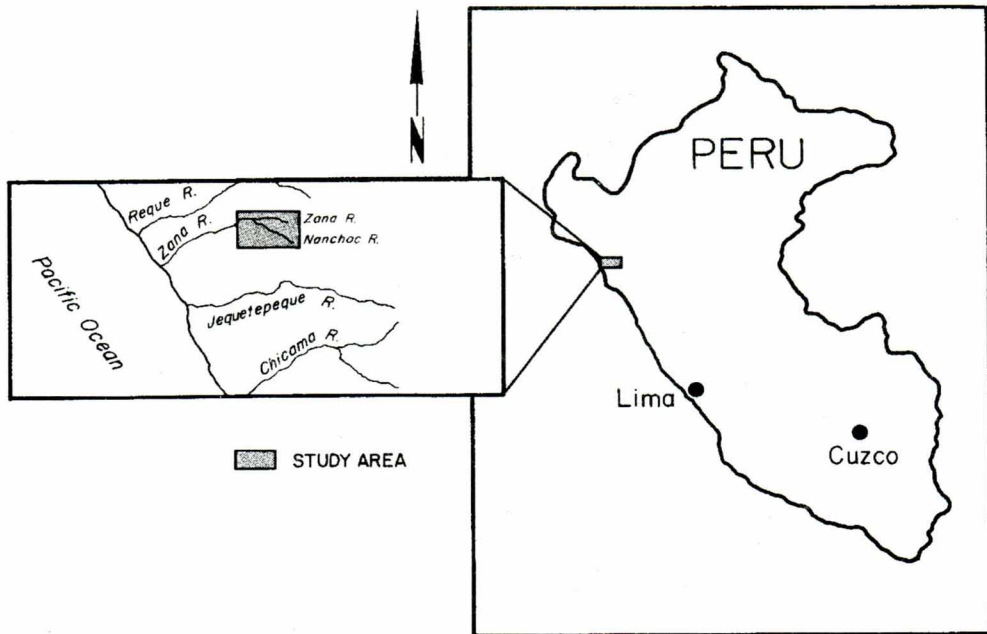


Figure 1. Location of the study area in the upper Zaña Valley of Peru.

in a side canyon, the Nanchoc Valley, where the vegetation grades from thorny brush at 300-500 meters above sea level and dry subtropical forest between 500-1200 meters above sea level to low montane dry forest between 1200-3000 meters above sea level. This vegetation is sustained by seasonal montane rainfall between November and April and by the condensation of ambient humidity and evapotranspiration, in the form of fog and fine rain the rest of the year. These lifezones probably oscillated in the past. The montane forest of the valley was and still is a primary coca growing zone.

The alluvial fans, especially those in the Nanchoc area, contain the highest density of Preceramic sites found in the valley. Fifty one sites have been discovered along streams and adjacent to springs in the Las Pircas and Tierra Blanca areas. Two Preceramic phases have been defined, the Las Pircas Phase dated between 6500 and 5000 b.C. and the Tierra Blanca Phase dated between 4000 and 3000 b.C. (Figure 2). Thirteen sites have been partially excavated, including the Cementerio de Nanchoc site where the two small scale earthen mounds are located. Survey in nearby areas has failed to reveal the same density and diversity of sites documented in the Nanchoc area.

RESIDENTIAL SITES

A review of the settlement and subsistence pattern for individual domestic sites during the Las Pircas and subsequent Tierra Blanca phases is straightforward. The settlement pattern is characterized by a network of households scattered over high alluvial fans. The sites are found on slightly elevated ground, adjacent to tracts of low terrace soil in the middle and lower courses of streams. There are as yet no signs of settlement on the floodplain below. This is such a consistent situation that there is surely a close relationship between subsistence and the particular habitats of the high fans in lateral canyons. Such a location may have been optimal for regular, but not deep and prolonged, flooding along the streams, which would have been advantageous for incipient gardeners (Dillehay et al. 1989).

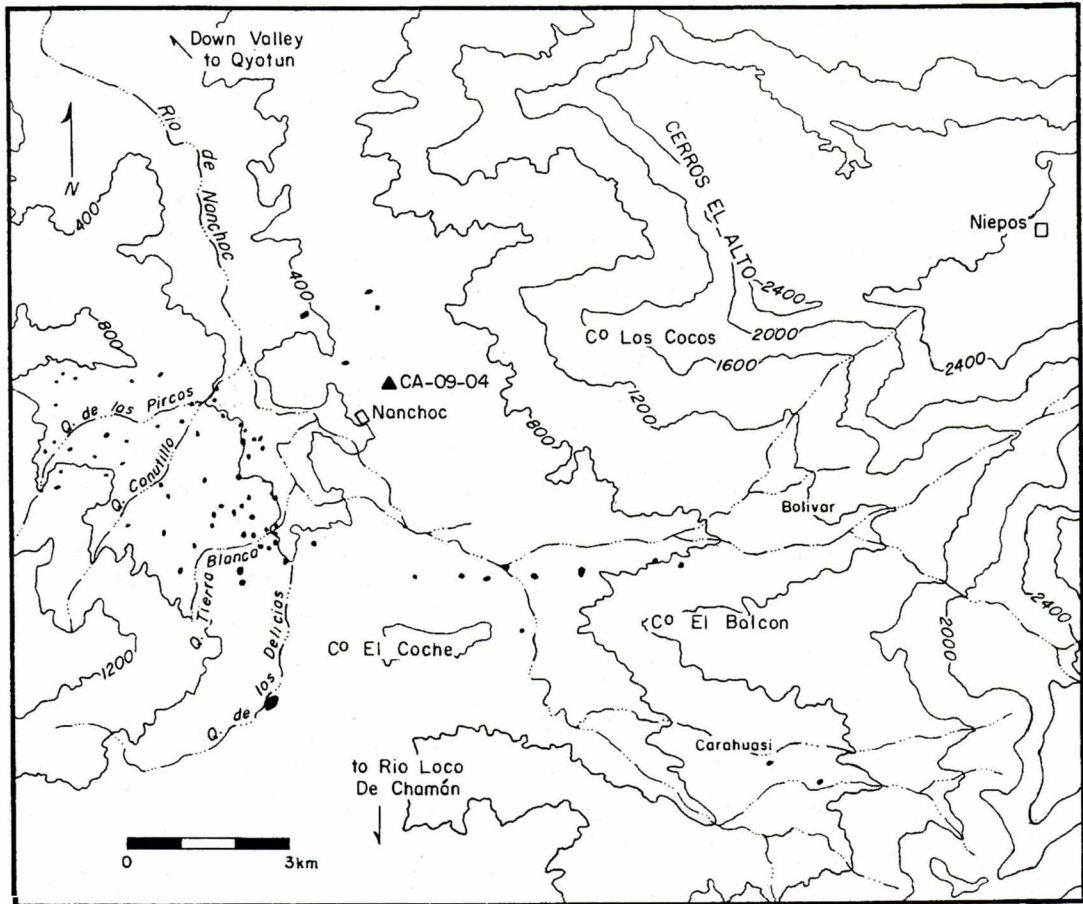


Figure 2. Dots represent the location of residential sites scattered along the Pircas, Canutillo, and Tierra Blanca streams. Note the location of the site CA 04 on the north side of the valley.

LAS PIRCAS PHASE (6500-5000 b.C.)

Las Pircas is the largest of the alluvial fans in the Nanchoc area. Its fans are dotted with small (30-100 m long) Preceramic residential and special activity sites, several of which have been excavated. Radiocarbon dates range from approximately 6500 to 5000 b.C., with the earliest sites located in the highest elevations of the fans. All Las Pircas Phase sites contain thin ashy eolian middens with alluvial caps ranging from 20-70 cm in depth. Features at these sites appear to be interrelated and are never superimposed, suggesting single continuous cultural occupations.

Site CA 27, a small (2.3 by 2 m) elliptical hut floor with a post hole pattern (Figure 3), was excavated. At two other excavated sites (CA 27 and CA 52), undulating areas without features are suggestive of ancient garden furrows. Although domestic refuse is found at all sites, human bone is primarily located at site CA 28, habitational structures and food refuse at CA 27, and possible garden plots at CA 27, CA 52. The human remains at CA 28 were most often cut longbones of adult males that were carefully placed in piles or shallow pits. Stone anvils apparently used in treating the dead lay nearby. Recent analysis of some of these bones by John Verano (1994) of Tulane University has suggested possible evidence of cannibalism. One complete flexed burial was also recovered at site CA 28.

The Las Pircas artifact collections are dominated by a varied, well made, exclusively unifacial lithic industry that we have termed the Nanchoc Lithic Tradition (NLT, 9; Dillehay

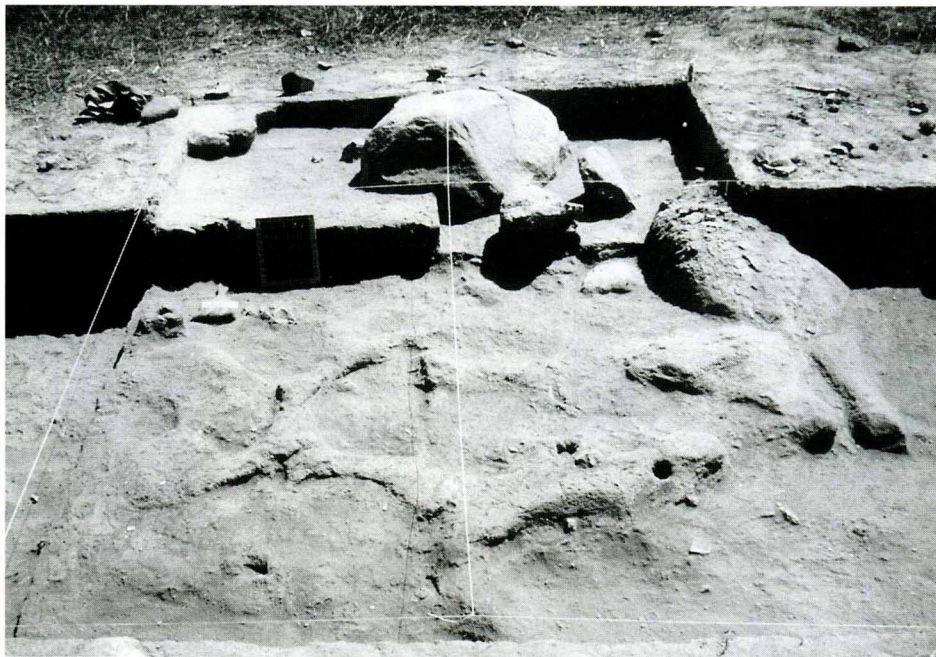


Figure 3. View of an excavated residential hut in site CA 27 of the Pircas Phase. The large rock marks the entrance to the structure. The raised adobe and mud represent the outer edges of the hut and the floor inside.

et al. 1995). Morphological, typological, and microscopic analysis of use wear on the edges of the stone tools indicate an industry with consistent flake tools. Almost 99% of all lithics are made of locally available basalt, andesite, diorite, and lapilli tuff. This industry can be distinguished from other northern Peruvian unifacial industries, such as the Siches and Amotope of the far north coastal Talara region which have been identified by James Richardson of the University of Pittsburgh, by its formal consistency and relatively fine workmanship. The NLT appears to have been heavily oriented toward plant processing and woodworking, as suggested by bright plant polish and fibers on some analyzed edges and by heavy wear on human teeth. Certain tool types appear almost exclusively in association with cut human bones and exhibit dull bone polish.

Besides lithics, the Las Pircas sites also contain an abundant and varied ground stone assemblage, numerous daub fragments with cane impressions, a small faunal assemblage indicative of a tropical forest environment (including jaguarundi, a boa like snake, and tinamou, a bird), abundant land snails (possibly a food item), and modest amounts of burned, broken, and only rarely, worked marine shell (from the coast 80 km to the west).

A small macrobotanical collection was recovered through water flotation, including squash, peanuts, manioc, a quinoa like chenopod, fleshy Solanaceous, and cactus fruits. This collection is problematic due to inconsistent AMS dates (ranging from 100 to 11600 years ago), yet the morphologies appear to be ancient, the contexts impeccable, and the remains are consistent with the above described stone tool artifacts indicating an early plant oriented economy.

Exotic items recovered in low frequencies from the Las Pircas sites are suggestive of household ritual (Rossen 1991). Quartz crystals, stingray spines, colorful marine shells, fossils, beads and amulets made of malacite, and one broken Paijan projectile point made of an exotic, bright red jasper represent various highland and coastal environments throughout the Cajamarca and Lambayeque departments (Figure 4).

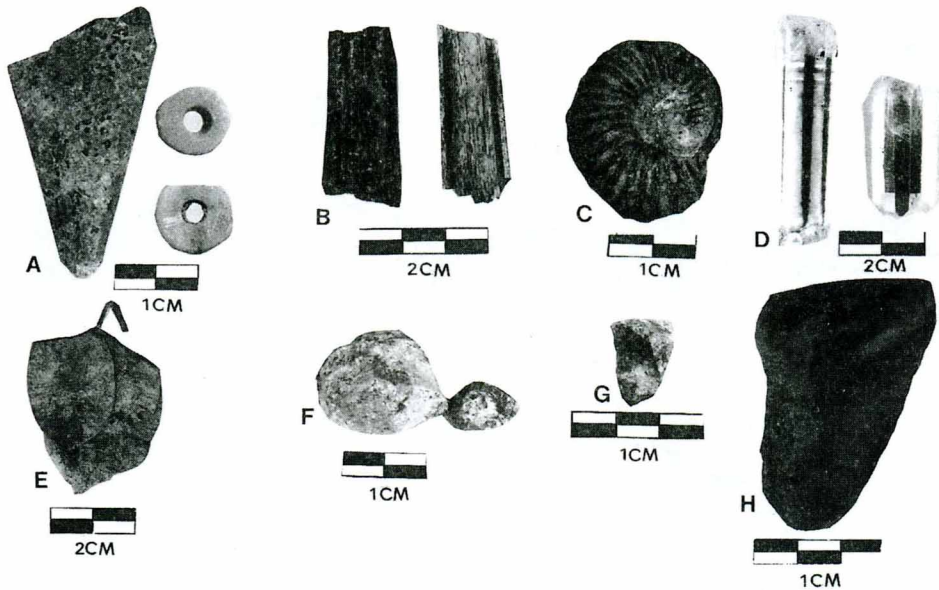


Figure 4. Various local and non local materials from Las Pircas and Tierra Blanca sites. (A) two beads and the fragment of an adornment made of malacite; (B) sting ray spines; (C) fossil shell; (D) quartz crystals; (E) coca leaves; (F) top view of conical shaped chunks of lime from Tierra Blanca sites; (G) (H) side view irregular shaped chunks of lime from Las Pircas sites.

Michael Harner (1973) of Columbia University has shown that the modern day Jivaro in eastern Peru ritually plant exotic stones and other items in their gardens to protect their crops from evil forces. A process of ritualization, perhaps connected to exotic items, would be expected of a group that is experimenting with the transplanting and alteration of new resources and related changes in settlement pattern and social structure.

Novel objects such as fossils, malacite, sting ray spines, quartz crystals, and broken but eye catching stone tools may have been among the earliest non food resources to be procured and managed by the local population. Some of these items, especially quartz crystal, may have been related to "garden magic", or at least a generalized intensification of household ritual indicative of exploratory plant manipulation. The acquisition of rare possessions would not have been an end in itself. The purpose was more to demonstrate status, standing, and prowess. Little or no labor was employed to modify these items. They are natural forms or scavenged objects.

The Las Pircas Phase appears in summary to have been characterized by a dispersed yet aggregated and locally permanent settlement system, of the sort that Bennett Bronson (1977) of the Field Museum in Chicago has termed as "pseudo dense", in that the site cluster defines a key natural or social resource instead of a purely dense or pressured population. Well developed unifacial chipped lithic and ground stone technologies, a heavily plant oriented economy, sporadic outside contacts, possibly household rituals, involving the acquisition of exotic materials, and the special treatment of the dead are evident. While exotics do not necessarily indicate regular exchange, their occurrence in house floors does raise the possibility that major economic and social changes were underway in the orbit of the Nanchoc area and that a certain cultural identity was being formed. Although no coca leaves were found in the Las Pircas sites, a few small amorphous shaped fragments of burned lime were present in the CA 27 and CA 52 sites, suggesting incipient extraction and processing of lime bearing rocks, probably occurring at the nearby Cementerio de Nanchoc site (see below).

TIERRA BLANCA PHASE (4000-3000 b.C.)

Along a stretch of the Tierra Blanca quebrada a number of small, single component domestic sites has been located, and five have been partially excavated. Not surprisingly, they superficially bear a close relationship to sites in the Las Pircas area but date later in time, from approximately 4000 to 3000 b.C., as determined by a series of radiocarbon dates on human bone and on charcoal recovered from hearths inside dwellings. The cultural levels within sites suggests a semi sedentary to sedentary population in that they are not thick and there are clear lenses of habitation debris revealing periodic site abandonment.

A typical Tierra Blanca Phase site is CA 77 which contains a semi rectangular house structure with rounded corners and with rock dividing walls and small hearths inside (Figure 5). The structure yielded a variety of stone tools, heavily fragmented and sometimes burned animal and human bone, and plant remains. Two small, basin shaped hearths were found. Several conical shaped pieces of lime, very similar in form and size to those recovered from localities A and B in the Nanchoc site, were found in the habitation floors of this and three other sites (CA 76, CA 81, CA 86). Also found were a wide variety of end scrapers, polishing stones, and grinding stones and slabs. Several pieces of unburned and burned malacite were found in the site as well, in addition to fragments of cotton, squash, chenopodium, and three leaves of wild coca (see Figure 4). A fragment of one coca leaf was dated by AMS radiocarbon means at 7080 ± 50 b.C. A radiocarbon date on human bone remains from the same layer was processed at 3695 ± 70 b.C., indicating that the prior date is too early. Wood charcoal from a house floor containing artifacts similar to those found at CA 77 were recovered from the nearby Tierra Blanca Phase site of CA 81 yielded a date of 3510 ± 30 b.C.

Another Tierra Blanca Phase site is CA 50 where excavations were carried out in a low residential mound. One radiocarbon date on charcoal from a hearth in the basal layer of the mound was processed at 3680 ± 60 b.C. Younger, undated layers extend forward into the

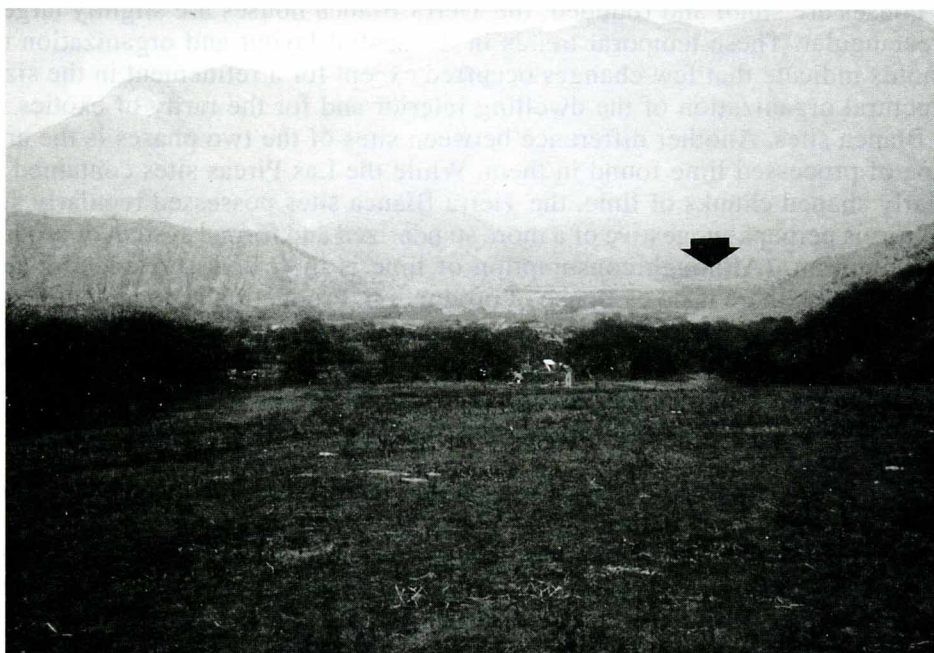


Figure 5. View of residential site CA 77 of the Tierra Blanca Phase. Arrow points to the Cementerio de Nanchoc site in the background.

Late Preceramic period, and are associated directly with fragments of peanuts and chenopodium. CA 50 is located at the lip of the floodplain near the Nanchoc River. Intact garden furrow areas and small irrigation canals that appear to be Preceramic were investigated near site CA 50 and the conjunction of the Tierra Blanca fan and the main valley floor. It seems a reasonable supposition that this site reflects conditions compatible with horticulture and an increased exploitation of forest fringe and floodplain resources. The kinds of diverse lithics and exotic items found in the Las Pircas sites were not recovered from the Tierra Blanca sites, possibly suggesting decreased autonomy and exchange and, in the presence of the mounds at the Nanchoc site, increased corporate activity. A few exotic lithics and marine shells were found, but these were generally of poor quality in comparison to those recovered from the Las Pircas sites. There is an increase, however, in the variety and quantity of marine shells, suggesting greater access to coastal food products.

In summary, the Tierra Blanca sites suggests that the occupants of the Nanchoc area exploited a range of local resources, including both wild and probably domesticated plant species. There is also an association between the unifacial flaked and ground stone tool industries and the rarity of novel artifacts. In comparison with the preceding Las Pircas Phase, the unifacial lithics are crude and poorly worked and more ground stone are present in the later phase. Treatment of the dead was less systematic in the Tierra Blanca Phase; instead of being systematically and carefully cut and placed, human bone was roughly broken, shattered, and trampled on the floors at sites CA 77 and CA 76. These changes may mean that a degradation or devolution of technologies, practices, and household autonomy (possibly including ritual) occurred during the Tierra Blanca phase. Despite this, however, this phase saw an increase in lime production and possibly coca and a food producing economy. Exchange of local commodities for marine foods also may have occurred.

The local communities of the Las Pircas and Tierra Blanca phases are characterized by permanent but dispersed communities. They are probably bounded units with contact with neighboring coastal and highland communities, as evidenced by the recovery of resources unique to those zones, especially during the earlier Las Pircas Phase. The Las Pircas houses are small and rounded; the Tierra Blanca houses are slightly larger and semi rectangular. These temporal trends in the spatial layout and organization of the households indicate that few changes occurred except for a refinement in the size and the structural organization of the dwelling interior and for the rarity of exotics in the Tierra Blanca sites. Another difference between sites of the two phases is the amount and type of processed lime found in them. While the Las Pircas sites contained small irregularly shaped chunks of lime, the Tierra Blanca sites possessed regularly shaped conical forms perhaps suggestive of a more standardized and formal system of production and consumption. (Although consumption of lime is indicated at residential sites of these two phases, there is no evidence of production. Production is documented only at the nearby Cementerio de Nanchoc site [see below]). The considerable variation in the co occurrence of specific artifact traits between sites suggests the emergence of household autonomy and possibly ritual during the Las Pircas Phase and the possibly development of ritually related communal activity and the demise of household autonomy during the Tierra Blanca Phase.

In terms of technology and interhousehold organization, the Las Pircas Phase may be viewed as a florescence, during which the quality and variety of lithic technology, along with possible household ritual (garden magic?), regular access to exotic goods, and formal treatment of the dead reached a local cultural peak. In contrast, as the subsistence inventory increased during the Tierra Blanca phase, lithics and the treatment of the dead took on a more haphazard and less sophisticated appearance, and few exotics were imported.

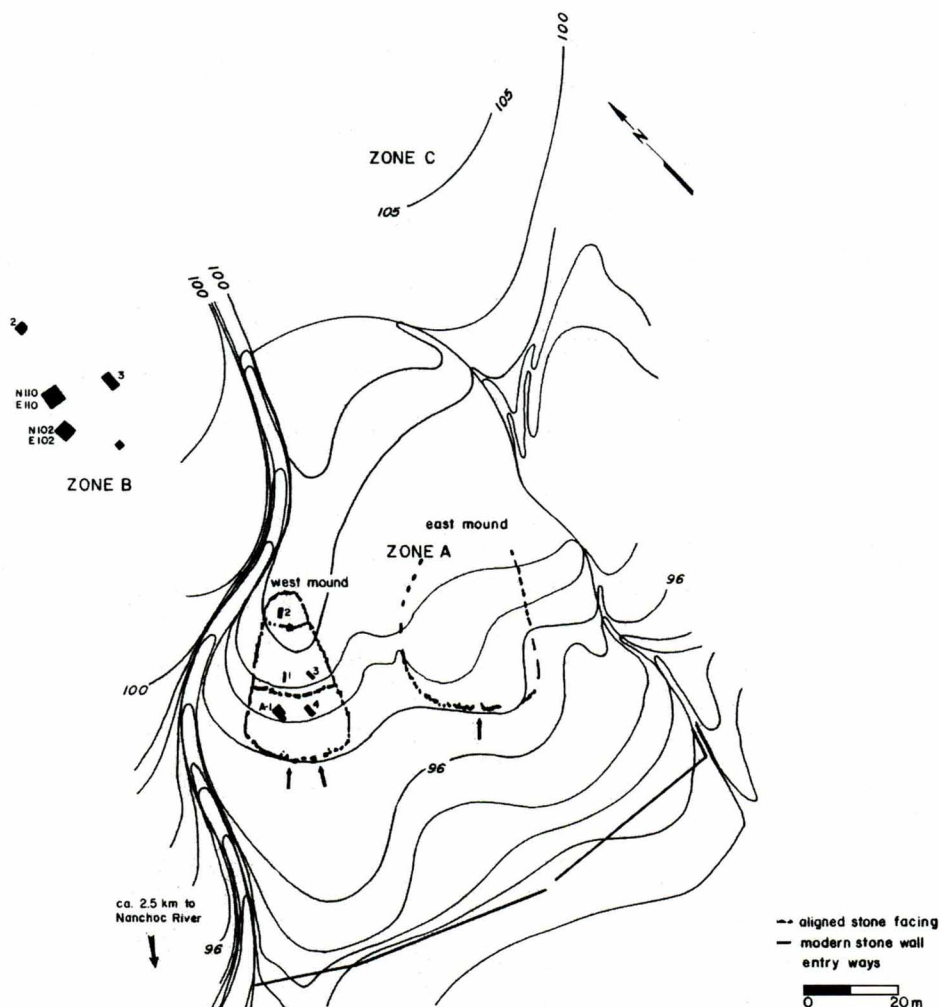


Figure 6. Topographic map of the CA 04 site showing the two stone lined, lozenze shaped A and B mounds.

COMMUNAL ACTIVITY AT THE CEMENTERIO DE NANCHOC

The Cementerio de Nanchoc site is situated in a small isolated fan that leads into the nearby highlands. The site measures approximately 100 by 200 meters in areal extent and is dissected by a small stream bed. Two areas were excavated, designated A and B (Figure 6). Locality A is characterized by two low earthen mounds situated on the east side of the stream. Locality B is situated 100 meters to the west side and contains hearths, burned lime, and refuse.

The earthen mounds in locality A are oblong, lozenze shaped, and are aligned with roughly cut basalt stones. The east mound in locality A has been heavily destroyed by a modern day cemetery. The west mound is characterized by three tiers, two entryways, and an outer stone lined boundary (Figure 7). Excavations have uncovered two sequential floors in the west mound which are lightly strewn with basalt and andesite flakes and a few conical shaped chunks of worked lime or cal similar to those recovered in locality B. In the Andes, lime is often used with coca leaves to extract alkaloid based juices or as a mineral supplement to the diet (Antunez de Mayolo 1981). No coca leaves were recovered from the site. A line of postholes and cultural debris associated with the lower floor suggest an accumulation of

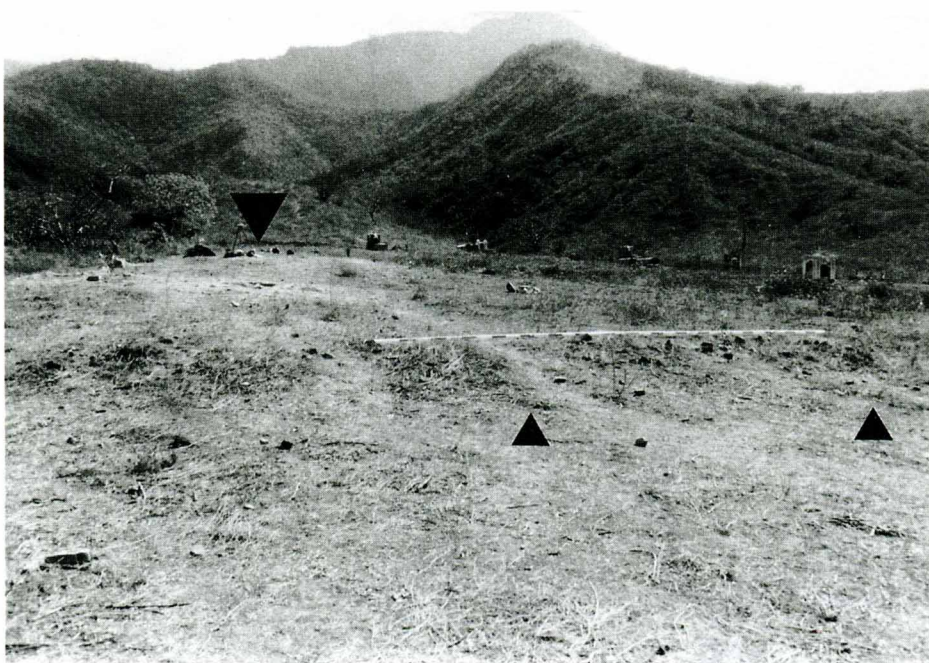


Figure 7. Entryway (small arrows in foreground) to site mound A in site CA 04. The rod measures 5 m in length. Large arrow in background shows tiered platform and stone lined back wall. Mound is a modern cemetery to the right side.

materials where an architectural structure once stood. A radiocarbon assay on charcoal from the underlying layer in the west mound is dated at 5770 ± 100 b.C. This date is associated with the first use of the mound, which at the time was possibly a ritual area marked by a low hummock or aligned stones. A piece of wood from the upper floor produced a radiocarbon assay of 3700 ± 60 b.C. This date is associated with the visible mound architecture and with the Tierra Blanca Phase. The 5800—3700 b.C. period for construction and use of the west mound agrees with the radiocarbon dates obtained from the hearths and middens in locality B. The dates also fit well with those from Preceramic residential sites in the nearby Las Pircas and Tierra Blanca quebradas on the other side of the valley. The layered habitational floors and radiocarbon dates indicate periodic use and rebuilding of the west mound.

Layers IIB and III in locality B, the open area on the west side of the small stream, produced an occupational floor, a light scatter of unifacial lithic artifacts, and hearths. A series of radiocarbon dates place the hearths and the floor in Layer III in the time range of 5300 to 4800 b.C. The hearths contained ash, burned rock, broken milling stones and manos, and small, amorphous shaped fragments of burned and partially burned lime. No floral, faunal or other food remains were found associated with the hearths and the floor. The most common types of stone implements were large flakes made of basalt and andesites. Microscopic analysis of the edges of six stone tools shows particles of burned and unburned lime, suggesting their use in the preparation of this substance. Locality B is interpreted as a manufacturing and processing area directly associated with the mounds in locality A.

We do not see the two earthen mounds as elaborate public structures with conspicuous architecture and exotic goods. Rather, they appear to be small scale structures with defined internal areas, which may have been used to organize inter household or community activities, including the production of lime and possibly feasting. Ritual production of the lime may have occurred, as suggested by the tiered mound architecture and by the absence of domestic refuse. In Peru, early public structures are commonly interpreted as having a ritual function.

Alternatively, it could be argued that the mounds may have been the residences of an extended household of high ranking community members, not a public non residential place. This interpretation is difficult to accept for three reasons. First, the use floors in the mounds are very clean in comparison to the residential sites. Only archeological evidence of lime production is found on them. There are no hearths and domestic refuse indicative of household residency in locality A or B. Second, the residential sites are associated with human burials. No human bones were excavated in the Cementerio de Nanchoc. Thus, we tend to view both localities A and B as a communal place where lime production primarily occurred. Admittedly, the archeological evidence for ritual related production is less convincing. However, given the spatial separation of the Cementerio de Nanchoc site and the mounds, it is possible that rituals were performed in conjunction with lime production.

In sum, we do not see the Nanchoc site as a part of a settlement hierarchy in the valley, but simply a small scale, public manufacturing locality associated with several residential sites dispersed in valley. Too, the isolation of the site in a small side canyon suggests a spatial and organizational barrier between communal and residential areas.

EXTRACTIVE TECHNOLOGY AND PUBLIC RITUAL?

While the Cementerio de Nanchoc site is located close to the major sources of lime bearing rocks in the valley, it presently is not possible to show how long it may have played a role in lime production and possible coca exchange. At this early stage in the Preceramic period, it is unlikely that activity at the site involved any political regulation of resources. Communal ritual, however, may have been associated with the extraction and manufacture of lime and possibly with coca use.

A distinction must be made between the technology of extraction and the communal support system through which it was implemented. The technology involves procurement of the local lime bearing rocks, the extraction of lime from them by burning and grinding the powdered residue of the rocks, and mixing the residue with salt and water to form a compacted concretion (Antunez de Mayolo 1981). The multiple hearths and processing areas documented at the Nanchoc site suggest various stages of lime manufacture that probably represent communal activity. Such activity probably entailed an economic arrangement, perhaps one through which the raw material and the technology became available and subjected to social regulation possibly through ritual ceremony. Although there are no objects in the site to directly indicate ritual activity, the form of the architecture, the isolated location of the mounds, and the proposed shift from household autonomy during the Las Pircas Phase to communal activity at the mounds during the Tierra Blanca Phase suggest it. Communal ritual might have developed along with a specialized lime extractive technology, which may have required a cooperative effort, during the latter phase. Linking specialized technologies and powerful ritual activity is not uncommon in the Andes, even at this early time. In speaking of important technologies, Heather Lechtman noted that: "Andean peoples engineered metal and fibers so that objects that functioned within the aesthetic and power loci of Andean society were there by virtue of their rendering....The technologies themselves conferred power and maintained the relations of power because process and product were culturally indivisible and, therefore, manipulable to the ends of ideology" (1993:274).

Coca growing, on the other hand, may have been a household activity in the Middle Preceramic Period, as it is today in the Andes, which may explain the absence of coca leaves at the Nanchoc site. Direct traces of coca production is the presence of three leaves of the Trujillo type (identified by the botanist Donald Ugent, personal communication, 1992) at the CA 77 site. We would not expect to find coca remains everywhere, however. Anyone who has observed coca chewers knows that little remains. Further, a preserved coca quid

may not always be archeologically identifiable or it may have been discarded outside a living area and thus not recovered. One indirect evidence of coca use and possibly exchange is the production of lime, assuming that the latter was not used as a mineral supplement by the Nanchoc people. If it had been used as a mineral supplement, we would expect to have found it in food middens and with other dietary items. This was not the case, however, for it was found exclusively with *coca* leaves and with special production areas. The development of small scale and part time corporate groups working at the Nanchoc site during the Tierra Blanca phase may have been more a function of the capacity of local groups to identify one or two important non food or food sources, such as lime and coca, to organize persistent production for local consumption and/or exchange distribution, and to meet increased social obligations of communal ritual and possibly alliance formations and conflict resolutions. Such activities at Nanchoc possibly lead to the sequential appropriation of a public work space during the Las Pircas Phase and a formal public site with mounds, where lime was produced during the later Tierra Blanca Phase. In other words, lime production may have spurred the appropriation of public space and the development of mounds at the site. Similarly, Jeffrey Quilter (1991) has argued that cotton production was a key to the development of late and terminal Preceramic sites on the coast of Peru between 3500 and 2000 B.C.

A striking difference exists between the cultural deposits in the Nanchoc mounds and in the domestic sites of the Las Pircas and Tierra Blanca areas. The deposits are thicker in the mounds with intermittent floors and features, only a few unifacial lithic types are present, and debitage is virtually absent, indicating a long term but light specialized use as opposed to the usually thin deposits and much higher artifact densities of the residential sites. This suggests that the continued or permanent use of a public place may have preceded the establishment of permanent occupation of large domestic settlements.

During the Las Pircas Phase territoriality may have existed at the local group level reflecting resource use rights in specific areas. At the household level, ritual involving death and fertility may have developed, perhaps reflecting the influx of new resources, including coca, lime, probably other plants, and different exotics from the coastal and highland poles of a valley long exchange networks. The appearance of the public mounds at the Nanchoc site during the Tierra Blanca Phase also suggests the development of small but specialized corporate bodies as distinct entities, and their increased importance within the community as a venue for establishing local cultural identity and for conducting local affairs and possibly linking with outsiders. Incipient extractive or production technologies and resources may have made pooling and cooperation more likely, probably regulated by local ritual cycles. Further, ceremonies may have attracted people from distant settlements for opportunities for marriage and gift exchanges and exchange of ideas and resources that created and reinforced ties throughout a large region.

SETTING THE STAGE FOR CIVILIZATION

We can draw some conclusions about early societal developments among local communities in the Zaña Valley. First, social and economic changes proceeded at uneven paces in different places in the study area. Some alluvial fans were occupied and others were avoided. Second, there is no evidence to suggest that population pressure and growth or climatic change were primary factors in these cultural developments. In fact, all evidence suggests that people were territorial and chose to live in certain nucleated areas. People aggregated in the Las Pircas and Tierra Blanca areas and left other suitable areas unoccupied. Third, the earliest cultural developments in the study area may not belong to any of the extant explanations of the appearance of societal complexity but to a different logistical network represented by

continued exploration of long distance resource zones, the possible development of a specialized ritually related extractive technology, its possible association with corporate activity, an explicitly plant oriented economy, and changing relations between the private and public sectors of the local society. And fourth, small scale public activity associated with mounds and lime production at the Cementerio de Nanchoc site may have been an instrument for consolidating these developments (*sensu* Quilter 1991) and for giving them local cultural identity and purpose.

The emergence of community wide mechanisms for promoting group integration and cohesiveness during the Middle Preceramic Period is supported by other Preceramic and early ceramic archaeological evidence within the Central Andes. Nondomestic facilities were constructed at several sites occupied by full blown agriculturalists, including Real Alto site (3000-2200 b.C.) of southern coastal Ecuador, the Chinchorro mortuary structures (4000-2500 b.C.) in northern Chile, the Asana site (ca. 3000 b.C.) in southern Peru, the Alto Salaverry site (3000-2500 b.C.) in northern Peru, and several ceremonial sites of the Kotosh Religious Tradition (3000-2000 b.C.) in the highlands of Peru. These and other sites suggest different ways of integrating different societies and segregating public and private space.

The Middle Preceramic populations in the upper Zaña Valley and at the localities mentioned above experienced some of the most fundamental transitions in human history. Those are semi sedentism, corporate unity, not just claiming resources but developing them beyond their natural state to be beneficial in other ways, establishment of communal places, and burial and reburial of people of different standing or identity. Although these transitions seem primitive from the perspective of later millennia, many of them led to the rise of urban society. From then on, the primary developments were those of organization and the means of handling increased complexity. Subsequent cultural developments required increasingly larger organizational units, such as that evidenced at the monumental ceremonial centers dating to the Late Preceramic and Initial periods in Peru.

It is difficult in archeology to define a universal suite of cultural mechanisms and processes that set the stage for early civilization. Archeologists know that most of the major potential causes for civilization must be examined in local contexts and from the perspective of ecology, political economy, and formal religious beliefs. Added to these interacting variables are the local historical conditions and opportunities that promoted authority, social integration, cultural identity. The emergence of community wide mechanisms for promoting group identity and cohesiveness during the early phases of civilization is supported by archeological evidence within other areas of the world. In many areas, the mechanisms sustaining cultural development were extensions of processes already present, though not yet dominant and not yet materially conspicuous communal structures. We believe that the kinds of cultural developments taking place in localities like Nanchoc in the Middle Preceramic Period were key in establishing the social, demographic, and economic foundations of Andean societies.

Acknowledgements: Funding for the Zaña Valley has been provided by the National Science Foundation, the University of Kentucky, Earthwatch, SUNY at Fredonia, and the American Philosophical Society. Permission to carry out the research in the area was provided by the Instituto Nacional de Cultura of Peru.

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