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Late Preceramic Peru

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This paper presents a synthesis of current knowledge of Late Preceramic Peru (ca. 4450–3800 B.P.), a field of study that is less than 50 years old. A brief history of investigations and discussion of chronological systems are presented. A review of Late Preceramic achievements concentrating on subsistence economies and technology is followed by discussion of the social world of Late Preceramic Peru and current consensus and disputes regarding culture processes. Extensive long-distance exchange, farming, and social complexity are first clearly seen in the archaeological record during this time period. Nevertheless, the significance of this evidence with regard to the nature and intensity of the culture practices and processes that they represent is currently under investigation and in contention.

KEY WORDS: Peru; Central Andes; preceramic; plant and animal domestication; monumental architecture; culture change.

DIMENSIONS OF THE FIELD: SPACE, TIME, AND FORM

Late Preceramic archaeological culture in Peru is identified by the formal aspects of large architectural complexes, distinctive ceremonial architecture, mortuary practices, the widespread presence of cotton textiles, the remains of domesticated plants and animals, and specialized small artifacts such as certain bead styles, snuff trays, and other items. Behaviorally, Late Preceramic Peru is characterized by the emergence of nonegalitarian societies, the spread of ceremonial systems over large areas, intensification in the use of domesticated plants and animals, and increased exchanges between distinct environmental zones. These artifacts and behaviors were common between about 4450 and 3500 B.P.

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Late Preceramic sites are most numerous on the Central and North coasts of Peru (Figs. 1 and 2), with fewer sites known for the highlands, due to poorer preservation and relatively less research there.

HISTORY OF INVESTIGATIONS

The concept of the Peruvian Preceramic is recent, dating to the 1940s. It was not that earlier archaeologists were unaware of a Preceramic or Archaic epoch but rather that their attentions were focused elsewhere and their theoretical perspectives were different than recent ones. From the inception of modern Peruvian archaeology at the turn of the century, through the World Wars, archaeologists concentrated on investigating the nature of prehistoric Peruvian civilizations rather than their origins. Max Uhle (1920) and, later, Phillip Means (1931), to give but two examples, recognized "primitive fisherfolk" and an "Archaic or Migratory" period, respectively. But where such folk came from or what they had accomplished was a moot point, with many assuming that civilization arrived with Mexican immigrants. The concept of migration as the key to understanding prehistory was aided and abetted by using Mesoamerica—the best-known Latin American prehistoric region and the one with the most appreciated art—as the yardstick against which Central and South American cultures were measured. Without chronometric dating techniques, the reasonable system for chronologically ordering Andean cultures was to attempt to cross-date them with Mesoamerica.

All this changed after the Second World War. The most significant research that focused attention on the Preceramic was carried out by Junius B. Bird (1948; Bird *et al.*, 1985), especially his excavations at Huaca Prieta, a fishing village occupied between 5000 and 4000 B.P. on the Peruvian North Coast. This work revealed a sophisticated fishing technology and what was cited at the time as evidence of America's earliest farmers who not only survived but prospered, producing intricately made cotton textiles and other crafts. Bird (1943) had worked earlier in northern Chile, uncovering a long tradition of Preceramic coastal adaptations. The Huaca Prieta study confirmed that early Preceramic sites were to be found practically at both ends of the Central Andean coast.

Another early investigator of Preceramic sites was Frédéric A. Engel, who directed the archaeology wing of the Centro de Investigaciones de Zonas Aridas (CIZA) of the National Agrarian University of Peru. Influenced by Childe's emphasis on the pivotal role of the origins of agriculture, Engel (1957) reported great numbers of pre- and early agricultural sites up and down the Peruvian coast. While faulted on theoretical and methodological grounds (Moseley, 1977; Bonavia, 1988), Engel's work demonstrated the ubiquity of Preceramic sites in the Peruvian littoral region. In addition, pioneering work on earlier Preceramic sites was being carried out in the highlands by Augusto Cardich (1958, 1964),

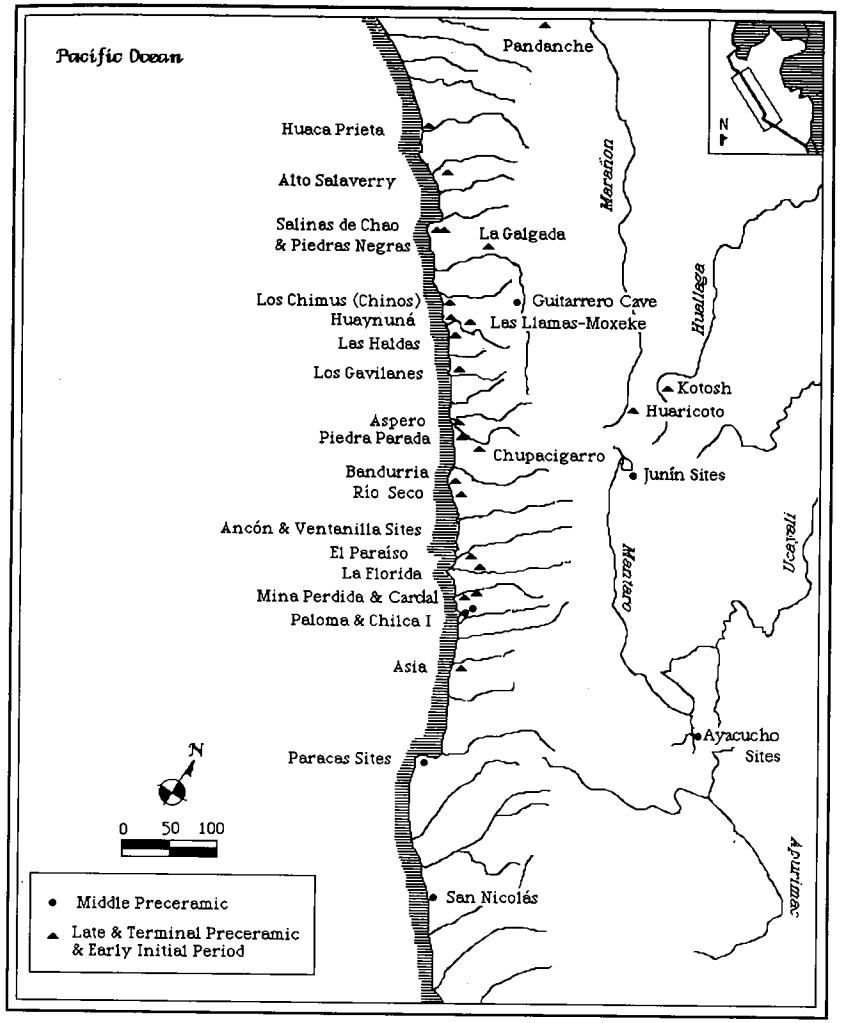

Fig. 1. Map of the Central Andes showing significant early sites.

and other early studies were made by Rafael Larco Hoyle (1948) and Heinrich Ubbelohde-Doering (1967). Through their researches and publications, it became clear that a new chapter in Andean archaeology was waiting to be written.

Starting in the 1960s, a number of scholars began to focus on the Preceramic. The greatest amount of work was carried out on the Central Coast, between the Lurín Valley and the Bay of Ancón. It was in this region that

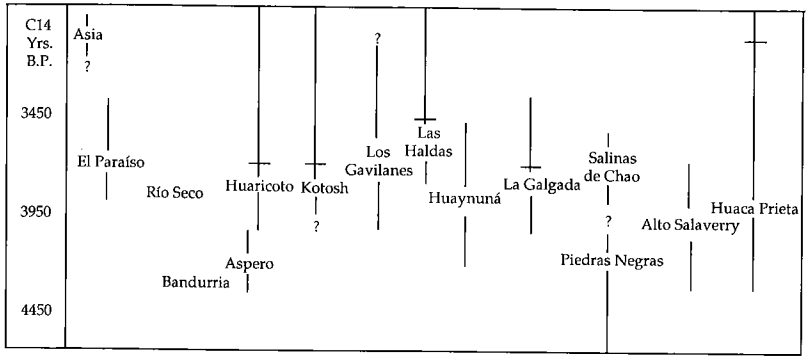

Fig. 2. Chronological spans of uncorrected radiocarbon dates for Late Preceramic sites. Bars on lines indicate the first presence of ceramics. A date of 2080 ± 130 [GX-5077 (Bonavia *et al.*, 1982, p. 75)] makes the final preceramic occupation of Los Gavilanes uncertain. The earliest (Cupisnique) ceramics found at Huaca Prieta were associated with a date of 2665 ± 200 [Libby/Chicago—75 (Bird *et al.*, 1985, pp. 53, 56–57)].

Edward Lanning (e.g., 1967), Thomas Patterson (e.g., 1971), and Michael Moseley (e.g., 1975) conducted intensive site surveys and other research and developed the fundamental framework and research issues that exist today. They did not work alone, however, for significant studies were and continue to be carried out by Peruvians, who have made many of the essential findings and observations of their country's antiquity, such as Walter Alva (1986), Duccio Bonavia (1982; Grobman 1988), Alberto Bueno Mendoza (1979, 1980; Grieder *et al.*, 1988), Rosa Fung Pineda (1972, 1988), Ramiro Matos Mendieta (1975), Carlos Williams León (1971, 1980, 1985), and others (e.g., Cardenes M., 1978; Muelle and Ravines, 1973; Ravines, 1967). Significant preceramic studies have also been made by French archaeologists, especially Claude Chauchat (1972, 1988) and Danièle Lavallée (Lavallée and Julien, 1975; Lavallée *et al.*, 1985), and by the Japanese archaeologists at Kotosh (Izumi and Terada, 1972).

One of the many subjects Lanning investigated was the role of marine resources in the diet of early coastal dwellers. Adding to this perspective, Patterson chronicled changing settlement patterns that included the possibility of year-round occupation of the coastal region by the exploitation of different resource zones. Michael Moseley's (1975) *The Maritime Foundations of Andean Civilization* developed the argument that the large architectural complexes of Late Preceramic Peru were built upon a subsistence base that was primarily maritime in nature. Although debate was developing prior to Moseley's book, (e.g., Parsons, 1970), the publication of his work sharpened the discussion as to whether Peru was an exception to the theory that civilization was built on agriculture or not; whether Peru conformed to models of the development of complexity that could be uniformly applied worldwide—with the adoption of

grain agriculture as the chief form of subsistence serving as the basis of civilization—or whether it was an exceptional case in which abundant food in the form of fish and mollusks served as the foundation of Peruvian civilization.

For the last 15 years, Preceramic studies have been carried out with fairly regular frequency, covering a wide range of subjects, from attempts at finding the earliest human occupation of the Andes and chronicling the advent of highland plant and animal domestication (MacNeish *et al.*, 1983), through investigating early highland hunters and the beginnings of pastoralism (Lynch, 1980; Matos, 1975; Rick, 1978; Lavallée *et al.*, 1985; Wheeler, 1984), to examining fisher-gatherers in the early stages of plant domestication (Benfer, 1986; Bonavia, 1982; Quilter, 1989a) and defining the nature of early complex societies (Burger and Salazar-Burger, 1980, 1985; T. Pozorski and S. Pozorski, 1990; Quilter, 1985).

Much research since the mid-1970s has focused on questions regarding the subsistence economies (e.g., Moseley, 1975; Quilter *et al.*, 1991) and the sociopolitical systems (e.g., Burger and Burger, 1986; Feldman, 1985; Patterson, 1983) of Late Preceramic peoples. Work also has been carried out to understand better the chronology, culture, and diversity present in the time in general (e.g., Fung Pineda, 1988). Given the immensity of many Late Preceramic sites, many studies have concentrated on using architectural data (e.g., Carlos Williams, 1980, 1985). In many ways, the study of Preceramic Peru is in its infancy, and much basic descriptive work and chronology building remain to be done.

CHRONOLOGICAL SYSTEMS

Two chronological systems are commonly used by Peruvianist archaeologists (Fig. 3). The first was developed by John H. Rowe (1962), and the second by Luis G. Lumbreras (1974). The dates at which culture changes are marked vary by only a few hundred years or less for both systems, but there are important underlying theoretical differences.

Rowe's system is based on standardized time periods that are not necessarily tied to culture change except as it occurred in the Ica Valley, on the South Coast. Thus, the Early Horizon is dated by the beginning of Chavín influence in Ica even though the Chavín phenomenon developed elsewhere and may have influenced other areas before Ica. The use of Ica as a "master sequence" for dating was based upon a mistrust of the accuracy of radiocarbon dates (Rowe, 1967) as well as wariness about the use of cultural evolutionary theory, although there is an inconsistency in the system since the Preceramic and Ceramic are considered as *stages*, with a clear reference to evolution. Lumbreras's chronological system is unabashedly evolutionary and the beginnings of different periods and epochs are directly linked to culture change so that the "Archaic

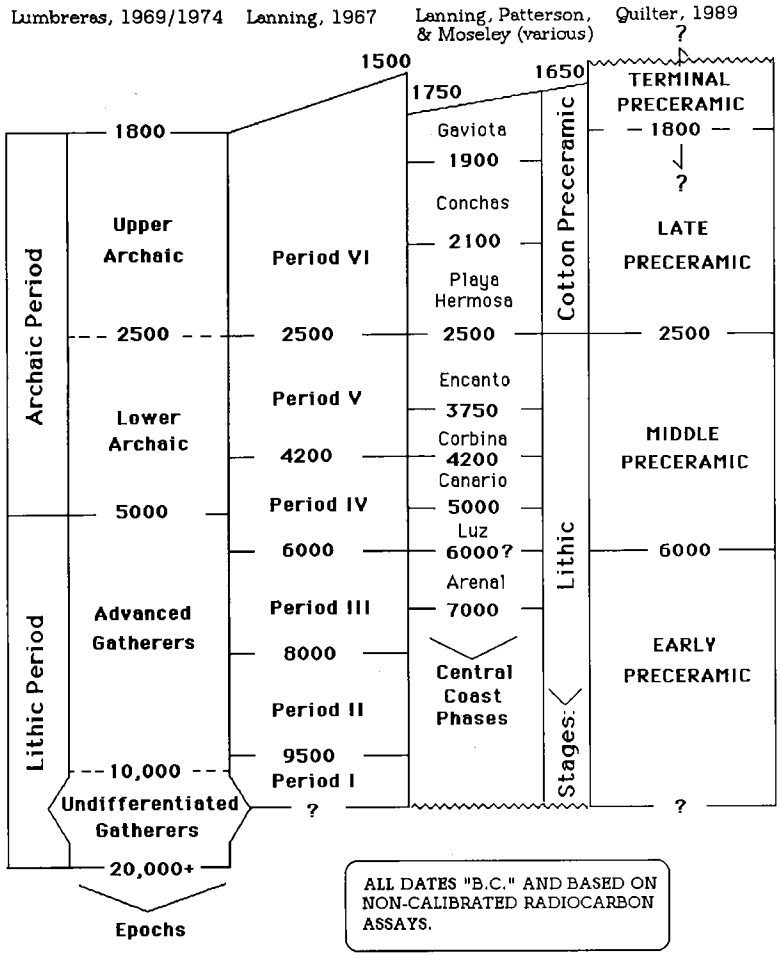

Fig. 3. Chronological systems for the Peruvian Preceramic.

Period," for example, may begin at different times in different places, a system similar to that used in North America (Willey and Phillips 1958).

No artifacts earlier than the late Initial Period were in the Uhle collections from the Ica Valley that served as the basis of the Rowe chronology. Lanning and Patterson (Lanning, 1967, p. 25) developed a Preceramic chronology relying primarily on their Central Coast data. The Preceramic was subdivided into six periods based upon technological and artifactual changes. While Rowe (Rowe and Menzel, 1967) produced a chart showing a uniform end to the Preceramic at 4050 B.P., Lanning pursued the evolutionary implications of the

stage system further, placing a general end to the stage between 4450 and 3800/3500 B.P. for the Central-to-North coast region in his table (Lanning, 1967, p. 25) while marking the end of the Preceramic as late as 1850 B.P. or so for the Far South Coast (Lanning, 1967, pp. 26–27).

Although Lanning suggested that revisions were in store for the future, no serious examination of the status of dates and data was made until recently (S. Pozorski and T. Pozorski, 1987; Rick, 1987). However, one change in the chronological system occurred in the use of the term "Cotton Preceramic." Moseley's (1975) five-phase sequence was based on changes in cotton textile technology linked to radiocarbon dates from at sites at Ventanilla Bay and Ancón. For the most part, this was a refinement of the Lanning-Patterson system, with all but one of the phases falling into Period VI. But while the broader framework in which these phases were placed still retained the stage concept, the Lithic and Ceramic Stages now bracketed a Cotton Preceramic Stage.

The term Cotton Preceramic has since come into general use to refer to the Late Preceramic when cotton textiles were made, and only one publication has consciously attempted to afix dates to it (Pozorski and Pozorski, 1987, pp. 7–8): between 4450 and 3800 B.P.—the time in which "complex societies first developed in Peru." Junius Bird (personal communication, 1979) once warned that use of the term Cotton Preceramic was faulty because the time of the introduction of cotton textile technology appears to vary in different parts of Peru. At present, it is still uncertain when cotton was first used in different parts of the Central Andes, and the nature of its use also varies, with cotton wefts appearing before use of the fiber for complete textiles (see Stothert and Quilter, 1991).

Elsewhere (Quilter, 1989a, p. 11), I briefly suggested that the terminology be revised to a uniform system utilizing Early, Middle, and Late Preceramic Periods (see Burger and Asaro, 1977). The essential integrity of the Rowe-Lanning-Patterson system is maintained, with the baseline, master sequence for Preceramic sites in Peru established in the Ancón-Ventanilla-Chillón region. Like all chronological systems the dates used are somewhat arbitrary, and citation of distinct artifact inventories as cultural or temporal markers presents problems due to continuity and variable rates of change in different parts of Peru. At present, the precision of the Ica Master Sequence based on the precise introduction of new ceramic traits as the hallmark for new periods cannot be duplicated for the Central Coast Preceramic. In general, however, the Early Preceramic [13,000(?)–8000 B.P.] is characterized by a hunting-foraging tradition in a late Pleistocene environment, and its beginning date, at present, is tentative (see Dillehay and Collins, 1991; Gruhn and Bryan, 1991; Lynch, 1990, 1991). The Middle Preceramic (8000–4450 B.P.) begins with the establishment of modern environmental conditions and societies which practiced broad-based economies but began to focus on exploitation of specific local resources, such

as fishing on the coast. The Late Preceramic (4450–3800 B.P.) marks the beginning of the widespread use of cultigens and the construction of monumental architecture in many parts of Peru.

This essentially grafts a Preceramic Central Coast Master Sequence onto the Ica Master Sequence. Given radiocarbon dates currently available (Fig. 2), some sites without pottery appear to have existed during the early Initial Period (S. Pozorski and T. Pozorski, 1990, 1991; Quilter, 1985, 1991). This is likely due to the problem of an arbitrary dating system applied to the more complicated dynamics of culture change and to the problems of utilizing radiocarbon dates for large sites with complex histories. But if the lack of clarity continues or if, indeed, sites with and without pottery were coeval, the term Terminal Preceramic might be used to refer to sites of preceramic culture that existed during the early period of the adoption of pottery and the beginnings of monumental architecture, or if this period can be clearly demarcated, the term could be employed for the time of transition, once known. Continuing research in northern Chile and southern Ecuador may also eventually require modification of current chronological schemes to integrate regional periodizations into chronological systems of larger areas.

LATE PRECERAMIC ACHIEVEMENTS

Environmental Background

Three large environmental zones run the length of the Peruvian nation (see Pulgar Vidal, 1987): the coastal desert, the sierra, and the tropical forest. Features within each zone have played important roles in human activities, such as mountain passes, tablelands (*punas*), and altitudinal variations in plant and animal communities. Both now and in the past, these factors affect the kinds of subsistence strategies that can be followed and the relative ease of communication, travel, and exchange. On the coast, for example, the merging of floodplains, such as the Rimac-Chillón, allowed for greater intervalley communication than those valleys in which rivers cut deep, isolated beds. In the highlands, one sometimes can travel for many days in the same environmental zone, walking in a horizontal plane. But within hours or less, vertical movement leads the traveler through different environmental zones layered like the strata of an archaeological site. These different arrangements of environmental zones define opportunities and limitations in the lives of Andean peoples.

Given the relatively harsh environment of the Peruvian coast and highlands, the precociousness of early achievements in the region is remarkable. The following subsections discuss current knowledge of various aspects of the people of Late Preceramic Peru. Following this, I turn to a discussion of recent and new perspectives on culture processes.

Food Economy

During the Middle Preceramic many Andean peoples shifted from broad-based subsistence strategies to ones that took advantage of local conditions and often focused on specific resources (Stothert and Quilter, 1991). In the Late Preceramic this trend continued and intensified. Varying patterns of hunting and gathering have been suggested for different areas of the highlands. In the upper Santa Valley, Lynch's (1980, p. 314, 1989) work at Guitarrero Cave suggested mobile populations that exploited a wide range of environments. In northern Chile, bones of sea fish were found in preceramic middens and coprolites at sites 100 km inland and at altitudes of 1500 m above sea level (Meighan and True, 1980, pp. 137, 197). At Lauricocha cave (Cardich, 1958, 1964) and the Junín region (Rick, 1980), however, arguments have been put forth for year-round occupation, and Rick has suggested the development of specialized hunting of vicuña during the Preceramic. Thus, two models, one suggesting long distance movements or interactions and the other arguing for locally based subsistence strategies, have been developed for the Andean sierra with the likely possibility of different strategies in different regions.

Wheeler (1984) has argued for the first domestication of camelids between 8000 and 5500 B.P. in Junín, with stock herding shortly afterward. But further south, in Ayacucho, selective hunting—perhaps a form of game management—was still practiced in the Chihua Phase (ca. 6450–5250 B.P.) (MacNeish *et al.*, 1983, p. 10), with no domestication until the very end of the Preceramic (Cachi Phase; ca. 5050–3700 B.P.), when stone corrals are in evidence. At Huaricoto, in the central highlands, faunal remains indicate that deer hunting continued to be the main source of animal meat in the Late Preceramic (Chaukayan Phase, 6100–5700 B.P.) (Burger, 1985, p. 532) with camelids only displacing deer in the analyzed samples in the Early Horizon (ca. 2550–1750 B.P.), long after the introduction of pottery and other major cultural changes.

Besides camelids, guinea pigs (*cuy*) are the other important highland domesticated animal which were important sources of meat in later prehistory and beyond. *Cuy* remains are absent at Preceramic coastal sites, present in Ayacucho (Piki/Chihua Phases, 7750–5250 B.P.) (MacNeish *et al.*, 1983, p. 9) and at Guitarrero Cave (Complex IV), and abundant at Kotosh (Wing, 1977, 1980, p. 164), and their rate of introduction to areas outside of their *puna* habitat also appears to vary (Lynch, 1980, p. 314).

For both camelids and guinea pigs, then, the archaeological data suggest early highland domestication followed by gradual introduction through time to lower elevations, reaching the coast quite late in prehistory (Wing, 1980;

Burger, 1985, pp. 275–276). There are variations, however, in the places and rates of introduction, just as the data appear to suggest that different overall subsistence strategies were followed in different regions of highland Peru. The consequences of these patterns for later cultural developments remain to be addressed in future work. The present data do appear to suggest that those regions where low intermontane valleys were occupied and farmed relatively early—Ayacucho, the Callejon de Huaylas, and the Huallaga Valley—were more quickly integrated into intraregional cultural systems than those areas where relatively broad-based hunting and gathering subsistence remained the dominant mode of production, such as Junín. But while regional exchange and vertical interdependency became important in later prehistory, and begin to emerge in the Late Preceramic Period, the data available for coastal subsistence suggest that local resources provided the bulk of the food.

Evidence for the first use of some domesticated plants is slightly earlier for the highlands in comparison to the coast. In Ayacucho, domesticated gourd, quinoa, and possibly squash (*Cucurbita andina*) are present in the Piki Phase (ca. 7750–6350 B.P.), with common beans, *achiote*, tree gourd, *lucuma*, coca, and possibly potatoes introduced by the Chihua Phase (ca. 6450–5250 B.P.). At Guitarrero Cave *Capsicum chinense* and *Phaseolus vulgaris* were apparently cultivated as early as 10,550–9950 B.P. (Smith, 1980, p. 110). Early dates (7950 ± 180, Beta-12,385, and 7920 ± 120, Beta-12,384) for the cultivation of squash, peanuts, plums (*Bunchosia armeniaca*), and *quinua* (*Chenopodium quinua*) also have been cited for sites in the upper Zaña and Nanchoc Valleys in far northern Peru (Dillehay *et al.*, 1989, p. 751). At present, there are problems with regard to the dating of some of these early plants in that they exhibit morphological characteristics that date them as early but with radiocarbon assays that have produced very recent dates (J. Rossen and T. Dillehay, personal communications, 1991).

The environment is somewhat wetter on the western slopes of the Andes in the Nanchoc region than farther south and the area can be viewed either as a point of diffusion from tropical areas to the north or east or as a tropical ecotone area itself, if environmental conditions in the past were wetter than those which sustain the present thorn forest. The data from Nanchoc thus may conform to Spinden's (1917; see Lathrap, 1977) ideas on the tropical origins of South American cultivated plants.

There is a remarkably great length of time between the Nanchoc and Guitarrero Cave dates and the earliest sure evidence of the use of some of these cultivars, such as peanuts and beans, in central coastal Peru, where some of the earliest examples of monumental architecture are to be found. Farther north in Ecuador, analyses of phytoliths appear to confirm debated macrofossil evidence of maize cultivation under way by about 7000 B.P. (Pearsall and Piperno, 1990). On the Far South Coast, archaic lifeways appear to have continued into the Late

Preceramic Period and beyond (Wise, 1990), suggesting that the direction of change in subsistence strategies was from north to south. However, continuing research in northern Chile suggests early domestication of some important plants there (Rivera, 1980, 1984, 1991), and more research will be needed to explain the spread or lack of it of domesticated plants from one Andean region to the other and the apparent peripheral status of the Central Andes, which apparently adopted many domesticates late yet became the core area in the development of hierarchical societies.

Late Preceramic coastal dwellers appear to have subsisted on a mixed economy of seafood and wild and domesticated plants (Bonavia, 1982; Weir *et al.*, 1988; Quilter *et al.*, 1991). The evidence currently available suggests that fish and mollusks provided the main source of animal protein. Fishing technology was sophisticated and likely done both close to and far from shore (see Quilter, 1989a). Fish typically taken included requiem shark (Carcharhinidae), ray (Mylobatidae), sea catfishes (Ariidae), herring (Clupeidae), anchovies (Engraulidae), mullet (*Mugil cephalus*), weakfish (*Cynoscion* sp.), and corvina (*Sciaena deliceosa*) (Quilter *et al.*, 1991, Table 1). Whales were probably exploited when they beached themselves, while sea lions and sea turtles could be taken when they mated on shore in January. Both sand-dwelling (mostly clams, e.g., *Mesodesma* sp.) and rock-dwelling (primarily *Alacomia* sp. and *Mytilus* sp.) mollusks as well as crustaceans, such as crabs, were consumed by coastal peoples, although they were probably not significant dietary components. Those species of shellfish common to beaches closest to coastal sites appear to be the primary ones consumed. Other animals played relatively minor roles in coastal subsistence. Deer remains are relatively rare at late sites, while birds appear to have been taken when in abundance but not on a regular basis, judging from their variable appearance in the archaeological record such as at Los Gavilanes, where they are numerous in some strata but not others (Wing and Reitz, 1982, p. 191).

The meat diet thus appears to have been broadly based on a variety of animals. Opportunistic exploitation of seasonally or randomly available resources was common, as is the case for most nonindustrialized food economies. Food considered relatively unimportant today may have played an important role in the overall Preceramic diet. For example, several hundred tons of freshwater crayfish (*Parastacus* spp.) are harvested annually in modern coastal rivers now much restricted due to irrigation practices (Tsunekawa 1988), and these resources and others may have contributed significantly to Late Preceramic diets.

Cultivated plants (Figs. 4 and 5) played an important role both as foods and for industrial purposes as in the case of gourd (*Lagenaria siceraria*) containers and cotton (*Gossypium barbadense* L.) fishing line and textiles. Squashes appear to have been domesticated in the Middle Preceramic, and chili peppers

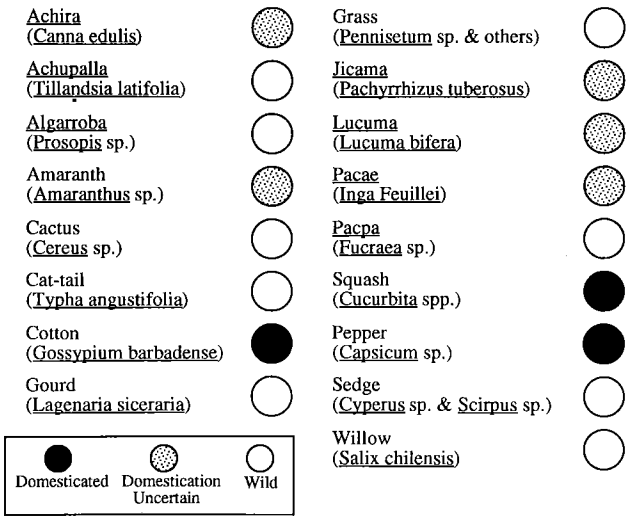

Fig. 4. Commonly occurring Late Preceramic plants.

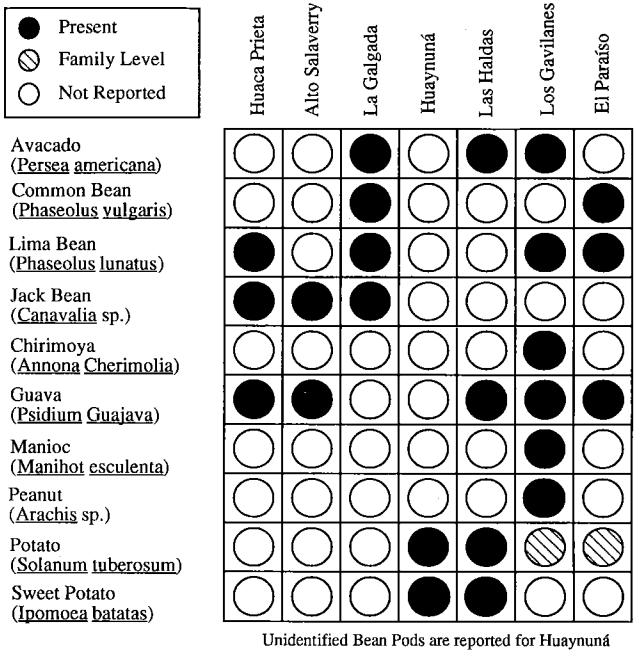

Fig. 5. Late Preceramic domesticated plants with varied distributions.

are clearly present by the Late Preceramic (Jones, 1988). New cultigens and a greater emphasis on farming in general occur in the Late Preceramic, but they appear to be part of a slow, steady growth in use from earlier times, rather than a revolution in subsistence economies.

Plants that are found in only very small quantities or not at all before the Late Preceramic but made their appearance during this time include beans (*Phaseolus lunatus*, *P. vulgaris*, *Canavalia* sp.), tree fruits [*Lucuma bifera* (*lucuma*), *Psidium Guajava* (guava), *Inga Feuillei* (pacae)], and tubers [*Pachyrrhizus tuberosus* (*jicama*), *Canna edulis* (*achira*)]. Domesticated potatoes (*Solanum tuberosum*) and sweet potatoes (*Ipomoea batatas*) have been reported from Huaynuná, near Casma (Ugent *et al.*, 1982, 1983). Of course, this list also includes cotton, as already indicated. Smith (1988, p. 144) suspects that split cottonseeds found at La Galgada were opened by humans in order to consume the oil-rich seeds and Hutchinson (cited by Bonavia, 1982, p. 344) has noted that cottonseed is also rich in sugar.

It is possible that cotton could have been managed before full domestication took place, with growth of trees in "orchards" (see Sauer, 1950, p. 534). At Huaca Prieta, Stephens (in Bird *et al.*, 1985, pp. 234–235) noted the presence of fuzzy seeds in Preceramic levels and tufted ones in the ceramic strata. The tufted variety prevails among modern cultivars and allows easier removal of fibers by hand. However, there is a clear trend of increasing size of seed, boll, and fiber in all of the levels at Huaca Prieta, suggesting that at least management and probably cultivation were under way in the Late Preceramic.

Evaluation of the relative importance of these and other foods in diets is difficult to make since the beans and tubers leave small amounts of residue, while the tree fruits leave relatively abundant amounts, primarily in the form of seeds. It is also difficult to estimate whether the tree fruits were under full domestication or "managed" without much human intervention in their reproduction, and it is also possible that some of the *achira* and *jicama* could have been wild. Further study of the possible use of cottonseed is important since except for some fish, such as anchovies, Preceramic diets were relatively poor in fats, and sugar was scarce.

There are variations in the presence or absence of different cultivated or managed plants at coastal Late Preceramic sites (Fig. 5). At present, it is uncertain whether such differences represent real patterning of the introduction of different plants to regions of the Peruvian coast, the results of environments favoring one or another plant in different areas, the effects of cultural and post-depositional processes at different sites, or variability in methods of recovery and study of plant remains by different archaeologists. For example, in addition to Nanchoc and Guitarrero Cave, plant remains at Los Gavilanes (Bonavia, 1982) are strikingly different from those found at other Late Preceramic sites, with plants there that do not occur elsewhere in Peru until later in prehistory.

Given the fact that there was a definite lag in the domestication and use of highland animals elsewhere, it may not be surprising that a similar phasing of use and spread of plant cultivars occurred as well.

The subject of the first use of maize (*Zea mays*) in the Andes is of great interest due to its assumed importance as an essential crop in later prehistory. Claims for early maize have been made for both Ecuador [ca. 7000–8000 B.P. (Stothert, 1985)] and Chile [ca. 6800 B.P. (Rivera, 1980)], while MacNeish and colleagues (1983, p. 9) suggest that maize may have first been used in the Ayacucho region late in the Chihua Phase (ca. 6450–5250 B.P.). Evidence of Preceramic maize at about the same date or slightly later has been claimed for Los Gavilanes, Aspero, and Guitarrero Cave (see Bonavia and Grobman, 1989). In addition, isotopic analysis of human bone from highland Peru has confirmed that maize was present in the Late Preceramic Period at Huaricoto [Chaukayan Phase, ca. 4150–2750 B.P. (Burger and Van Der Merwe, 1990, p. 91)]. Despite criticisms (R. Bird, 1987; Vescelius, 1981a,b), the evidence for Preceramic Andean maize is increasing. However, maize does not appear to have been a major dietary constituent at many Late Preceramic sites as it is found in very small amounts, with rare exceptions (Bonavia 1982), and the isotopic analysis of the Huaricoto bone indicated maize played a minor role in diets.

In addition to domesticates, a large number of wild, and possibly managed, plants were utilized by Preceramic peoples. These include Amaranths and Chenopods as well as a number of unidentified grasses that appear to have been wild. The roots of marsh sedges (*Scirpus* sp. and *Cyperus* sp.) were eaten, and *tomatillos* (*Physalis* sp.), various tubers, and other *lomas* and valley plants, as well as marine flora such as algae, and probably sea plants enriched the diet.

Studies of coprolites from Huaca Prieta (Callen and Cameron, 1960; Bird *et al.*, 1985, pp. 239–240) support the argument that diets were primarily composed of wild and domesticated plants and fish. Cucurbit, chile pepper, and two types of beans were definitely identified as well as tentative identification of *Canna* and fibrous roots, possibly of cat tail or similar plants. In addition, the stomach contents of a burial showed evidence of mussel, snail, and sea urchin shells as well as crab claws and a considerable amount of vegetable remains, including a large quantity of peppers. The same general emphasis on seafood, collected plants, and a few cultigens was also found in coprolites from five sites on the central coast (Weir *et al.*, 1988). This pattern generally held true for 10 coprolites from El Paraíso, although there appeared to be a somewhat greater emphasis on riverine resources, and one coprolite had a considerable amount of mammal meat residue (Jones, 1988; Quilter *et al.*, 1991).

Preceramic cultivation systems are not well-known. Coastal "sunken" gardens excavated close to the water table may have been in use in the Chilca Valley in the Late Preceramic, but they do not appear to have been used much elsewhere (Benfer *et al.*, 1987; Parsons and Psuty, 1975). The excavators of

La Galgada report the presence of canals (Grieder and Mendoza, 1985, p. 93) and believe that irrigation was practiced. On the other hand, many Late Preceramic sites are located near floodplains, suggesting that if irrigation was used, canals and other infrastructural components were relatively simple. Such systems were vulnerable to destruction by later agricultural activities and so evidence of them is difficult to find.

Our current picture of diets in Late Preceramic Peru is one of a diversity of foods based upon a mixed strategy of foraging, fishing, horticulture, and hunting. It is likely that new cultigens were adopted in different parts of Peru at different times, but avocados, maize, peanuts, and others did not achieve relative importance until much later in prehistory.

There are a number of important questions that remain to be answered. What factors encouraged some highland peoples apparently to restrict their resource procurement to relatively small regions while others went farther afield for food? When, how, and why did such patterns change? More research is needed regarding the apparent temporal lags in the adoption of some domesticated plants and animals in certain parts of Peru and not others. While both terrestrial and marine resources likely were important dietary components, es pecially for coastal populations, we must determine more precisely the roles of specific resources from these zones as well as develop general, theoretical models of the adoption of domesticated plants in the Central Andes.

Technology

Construction

Late Preceramic building materials included cane, logs, stone, and adobe. Cane or fiber matting was used for roofs and floor covers. Logs and poles served for bracing doorways and as roof beams and were made from any suitable material available including *lucuma*, willow, and acacia (*Prosopis juliflora*), while tree limbs, branches, and cane were employed for the construction of house walls. Given the relative scarcity of wood, any large plant that could provide house posts or beams was used, or even bound groups of branches (S. Pozorski and T. Pozorski, 1986, p. 389). On the coast, serviceable material was even procured from the slopes of the Andes, such as *Fourcroya*, which grows at altitudes between 1450 and 3500 m (Fung Pineda, 1988, p. 78).

The use of stone depended upon its availability. At Aspero large rounded, river cobbles were used for construction, while at El Paraíso, stone was quarried from nearby hills, often 30 m or less from the construction site. The river cobbles were used unmodified, while quarried rock was roughly trimmed. Both types of stone were covered with clay plaster. At Huaricoto, a large platform was made by creating a core of mixed clay and unmodified stones with a retain-

ing wall of large stones braced by smaller rocks in a clay matrix mortar (Burger and Salazar-Burger, 1985, p. 122).

No detailed studies are available describing the composition of various earths used in building construction. A rather coarse mud appears commonly to have served as a primary coating for stones, while finer layers, resembling plaster-like coatings, were used to finish walls and floors. These materials were often colored white, pink, or light blue (Quilter, 1985, p. 290) and red and yellow paint was reported as present on the exterior walls of Unit I at El Paraíso (Napoli, 1967, p. 53). Adobe bricks do not appear to have been common at Preceramic sites as they were in later epochs. Lumpy balls of various shapes tending to ovoid forms and averaging 21 cm in length were found as fill; however, at El Paraíso (Quilter, 1985, p. 295).

One of the most diagnostic features of coastal Late Preceramic and Initial Period architecture is the use of "bagged fill" (*shicra*) in construction (Fig. 6). The *shicra* consist of looped net bags made of unprocessed or minimally treated sedges and filled with rocks, either river cobbles or quarried stone, depending on availability. These modular units were used to fill rooms and other structures for construction and rebuilding. Study of a small sample of eight bags from a single room at El Paraíso yielded a mean weight of 25.77 kg (Quilter, 1985, p. 295). Excavations in other rooms suggested that the average weight of *shicra* varied between about 17 and 30 kg, and this may have been due to separate work crews filling different rooms.

Fig. 6. *Shicra* (bagged fill) emptied of rock fill, found at El Paraíso.

The dry recitation of facts regarding construction given above belies the impressive size of Late and Terminal Preceramic public architecture, which is discussed more below. Coordination of efforts was essential to the construction of these large architectural complexes. This must have included standard units of measurement in order to erect large buildings efficiently. Data from El Paraíso suggested that a standard measurement unit of a division or multiple of a "preceramic meter" between 80 and 100 cm was used (Quilter, 1985, p. 294). Detailed reporting of measurements for other early architecture is only available at La Galgada (Grieder *et al.*, 1988) and Kotosh (Izumi and Terada, 1972). At these sites (see also S. Pozorski and T. Pozorski, 1979, p. 351) measurements are reported that commonly use 5- or 10-cm units. Whether this reflects actual construction standards or the rounding-off of measurements by archaeologists is unknown, and until studies are specifically done to examine units of Preceramic measurement systems, most conclusions other than that such systems were apparently in use would be premature.

Stone Tools

Chipped stone tools are common in the highlands but relatively rare on the coast. In both domestic contexts, such as at Alto Salaverry (S. Pozorski and T. Pozorski, 1979) and in refuse at large architectural complexes, they are quite rare. At Asia, only four chipped stone points/knives, were found (Engel, 1963, p. 56). Hardwood darts were recovered in association with spearthrowers at the earlier Paracas site (Engel, 1963, p. 56, f.n. 21), and it is almost certain that such weapons as well as slings were in use in the Late Preceramic. The relative rarity of chipped stone tools on the coast is a further indication that subsistence economies there were oriented toward farming and fishing, while the highlands maintained a mixed economy that included hunting in an important role. Stone points are found in Late Preceramic levels at highland Kotosh but decrease through time and are absent in the final two ceramic phases at the site (Izumi and Terada, 1972), perhaps correlating with the decreased role of hunting there.

The available information suggests that stone tools were made to produce a serviceable edge, with bifacially worked choppers and scrapers being common, as well as minimally retouched flakes (see Bonavia, 1982, pp. 77–100; Bird *et al.*, 1985, pp. 77–91). Previous attempts at using projectile points for relative chronology on the coast (Lanning and Hammel, 1961) have been critiqued (Chauchat, 1988), and a reevaluation of the problem for many parts of Peru remains to be done, although the highland series have remained unchallenged (e.g., Cardich, 1958, 1964).

Most of the raw materials for chipped stone tools appear to have been local, including river and beach cobbles, commonly of quartzite, basalt of varying degrees of fineness of grain, chert, and the ubiquitous "greenstone" cited in many archaeological reports, which is similar in workability to a fine-grained

basalt. The exception to this is obsidian, of highland origin but found at coastal sites, especially on the South Coast (e.g., Vescelius and Lanning, 1963). Burger and Asaro (1977) have conducted trace element analyses of obsidian that define three large, ancient interaction spheres in which obsidian was exchanged. The pattern of intrahighland and highland–South Coast exchanges established in the Preceramic, with relatively little obsidian on the North and Central coasts, continued throughout prehistory.

Ground stone artifacts are common at Late Preceramic sites. Many of them are large ovoid cobbles which were modified through use rather than deliberately shaped. Although no detailed assessment has been made, the mano and metate appear to have been used more commonly than the *batan*, or rocker stone, which became the most popular tool for grinding grain and other foods later in prehistory. Other stone artifacts included various kinds of net sinkers—often simply a grooved pebble or drilled slab of stone—as well as hammerstones and pebbles ground along one edge. Rare items such as a drilled stone resembling a pipe bowl fragment (Engel, 1963, Fig. 165) or a finely made pecked stone bowl (Engel, 1963, Fig. 145) are also found. Modified flat cobbles, sometimes grooved, served as axes (Feldman, 1980, p. 147), and small, flat round cobbles served a variety of purposes, from grinding pigment to opening mollusks (S. Pozorski and T. Pozorski, 1979, p. 356, Fig. 13; Quilter, 1985, p. 285).

Elaborate Preceramic ground stone objects include the remains of five mortars (some with pestles) made of dense, fine-grained metamorphic stone, found at La Galgada (Grieder, 1988a, pp. 99–101). In addition, a stone cup with an engraved, grooved-step motif was found there. Made of a grainy, gray sandstone, it is believed to be an import and the style of its designs resembles Kotosh Waira Jirca pottery (Grieder, 1988a, p. 101). At Aspero, a four-legged grinding stone was found with an infant burial on the summit of a platform mound (Feldman, 1980, p. 147, Plate 12). Fung Pineda (1988, p. 71) has noted that a similar artifact was found in an early ceramic context at Shillacoto, in the highlands (Kano, 1972, pp. 148–149). So, too, notched, polished stone axes also may have been exchanged over long distances. They are found at Kotosh from the earliest levels through the remainder of the occupation (Izumi, 1971, Table 2).

Shell, Bone, and Wood

Few utilitarian tools were made of shell with the exception of fishhooks, commonly cut from thick mussel shells. Sickle-shaped shell hooks (and one of bone) were found with line attached at Asia (Engel, 1963, Fig. 129), and at Huaca Prieta a thorn hook with cord was found (Bird *et al.*, 1985, Fig. 168). Mollusk valves, usually mussels, served as handy small containers in ancient Peru, as in many other cultures, and shell paint cups were found at Huaca Prieta

(Bird *et al.*, 1985, p. 166). Ornaments, including pendants and disk-shaped beads, were commonly made of shell as well as other materials.

Teeth, horn, and bone served a wide variety of purposes from ornamentation to utilitarian tools. At Asia, a large carved tooth may have been used as a container (Engel, 1963, p. 142), while shark teeth were attached to the working end of a club (Engel, 1963, Fig. 138). The large size of whale bone made it a useful material for shaping into picks, axes, and other tools (Engel, 1963, p. 61). Mammal bones (probably sea lion and deer) were split and used as awls, sometimes with only minimal modification. More work produced spatulas, chisels, and needles (see Engel, 1963, p. 61). Distinctive tools resembling flat awls, commonly with a perforation at the proximal end, were in use for manufacturing twined textiles by at least the Middle Preceramic (Quilter, 1989a, pp. 32–34) when they were also worn around the neck in the manner of ornaments. Their functional use apparently was complimented by a symbolic role as in evidence by a decorated shell pendant resembling a textile tool found at El Paraíso (Fig. 7).

Cut bird and mammal bone tubes are present at Late Preceramic sites. At Asia, some of these were found strung as necklaces (Engel, 1963, p. 53). Sometimes, the ends of these tubes were ground smooth, and it is possible that they were used to inhale hallucenogenic snuff, since palettes likely used for this purpose also have been found (Engel, 1963, p. 59).

Various pointed sticks, pegs, and other objects of unknown use commonly are found on the arid coast. Wooden objects include spearthrowers, spears, possible harpoon foreshafts (Engel, 1963, Fig. 136), trays, and tubes as well as other items. Hardwood sticks, pointed or beveled, were likely employed in digging wild plants, in agriculture, and to collect mollusks (see Engel, 1963, pp. 55–67; Bird *et al.*, 1985, pp. 220–227; Grieder, 1988a, pp. 95–96). At Aspero, Feldman (1980, p. 145) found a number of short sticks with marks indicating that they were lashed together with string in an arrangement similar to that found in modern crab traps.

While objects for everyday use are well preserved in the arid coastal environment, elaborately carved wooden objects are rare. Perhaps this is due to the nature of available woods, their scarcity, or the emphasis on creative expression in other media, such as textiles. An exceptional find of wooden artifacts was made at Aspero. Part of a carved wooden bowl and about 135 flat, carved sticks were found deposited in a pit dug along the centerline of the Huaca de Los

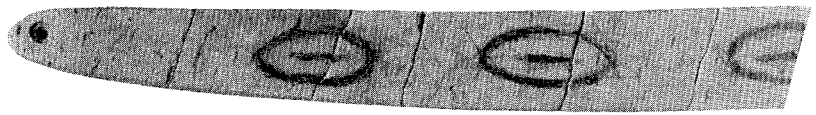

Fig. 7. Bone pendant incised and filled with blue material, found at El Paraíso.

Sacrificios. The bowl was broken and partially burned but two frogs carved on the outside in low relief remained on the preserved fragment. The sticks varied in size from 1.5 to 8.5 cm. While more than half were undecorated, the rest had been carved with a variety of lines, bumps, chevrons, and other geometric designs (Feldman, 1980, pp. 136–145). A few undecorated sticks which generally resemble those found at Aspero have been illustrated for Asia (Engel, 1963, Fig. 181) but ethnographic analogues for these artifacts are unknown.

Industrial Plants and Fiber Crafts

Plants likely used for utilitarian purposes such as the soapberry (*Sapindus saponaria* L.) and horsetail (*Equisetum* sp.), possibly used as a scouring pad, have been found at El Paraíso, and medicinal plants still in use today such as *Rapanea* have also been recovered. At Aspero, Feldman (1980, p. 175) recovered the remains of *Luffa operculata*, a wild cucurbit that produces fruit now sometimes used in a dried form as a sponge. Cactus spines served as needles, fish hooks, and in combs.

Gourds were the principal containers. They could be cut in a variety of ways to serve as bottles, open-mouthed bowls, scoops, and ladles (e.g., Grieder, 1988a, Fig. 94 B). They were occasionally but not frequently decorated using fine-line carving and pyroengraving. (Bird *et al.*, 1985, p. 228; see Grieder, 1988a, Fig. 94c). Perhaps the most renowned Preceramic artifacts are the two pyroengraved gourds found with a burial at Huaca Prieta (Bird *et al.*, 1985, pp. 70–74). Gourds were useful not only as containers but also as net floats. At Huaca Prieta, Bird (*et al.*, 1985, p. 225) discovered the remains of a large seine net with eight long-necked bottle gourds tied to it as floats. In addition, pieces of gourd were made into enigmatic disks. Small disks were used to plug the gourd floats at Huaca Prieta, but large ones, sometimes with perforations at their margins, range in size from 3 to 7 cm (Bird *et al.*, 1985, pp. 226–227) and their use is unknown (see Quilter, 1989a, pp. 28–32).

Twine and cordage were made from sedges, cactus (*Cereus* sp. and others), and *Furcraea* sp. The ubiquitous bromeliads of the coastal region (e.g., *Tillandsia latifolia* Meyen) were a primary source of fuel and also served as fibers for cordage (Grieder, 1988b, p. 155). Some of the most common materials found at Preceramic sites are fragments of basts [*Fourcroya* (*occidentalis?*); milkweed (*Asclepias* spp.)] (see Bird *et al.*, 1985, pp. 102–105) and rushes which were used for a wide variety of purposes. The rushes are commonly referred to with the generic term, *junco*, but are actually either *Scirpus totora*, *Scirpus* sp., or *Cyperus* sp. In addition, objects made of human hair, usually cords or string, occur regularly but infrequently at coastal sites.

In addition to the *shicra* bags, already mentioned, a variety of baskets and mats, cordage, clothing, and many other objects were made from wild fibers. Only four Late Preceramic site reports discuss fiber arts in detail (Bird *et al.*, 1985; Bonavia, 1982; Engel, 1963; Grieder *et al.*, 1988), and most of the following is taken from them.

The use of baskets may have been highly variable during the Late Preceramic. A total of 272 basket fragments was found at Huaca Prieta (Bird *et al.*, 1985, p. 92) and basket fragments appear to be fairly common at La Galgada, though the total number of fragments is not reported (Grieder, 1988b, p. 152). But only two basket fragments were found at Asia (Engel, 1963, p. 52), and none were found at Los Gavilanes (Bonavia, 1982).

The basketry that has been recovered consists of twined and woven varieties as well as examples with alternating combinations of the two techniques. Twill weave is present but not common. As is also the case with matting and finer *junco* and bast textiles, occasional examples of baskets with cotton wefts are found such as two instances at Huaca Prieta, one of which was done in designs resembling those on cotton textiles (Bird *et al.*, 1985, Fig. 62). A fine example of an almost-complete basket of oblique interlaced totora was found at La Galgada (Grieder, 1988b, Fig. 100).

Net fragments found at many sites may represent carrying devices that could have served many (though not all) of the same purposes as baskets. Both knotted and looped varieties and small and large meshes are found. The use of nets in economies which emphasized fishing might partly explain the absence of baskets at some of these sites but it is likely that the use of basketry was tied to specific economic or other factors which produced the observed variability.

Mats were used for a wide variety of purposes such as floor covers and roofing material and, probably, as wraps and sleeping pallets. Burials were commonly wrapped in them. Of 76 mats found at Huaca Prieta, 7 were woven and the rest twined (Bird *et al.*, 1985, p. 98). A total of 155 specimens was recovered from Asia, all of which were twined. Mats were plain twined, although two cases of split-paired twining were found at Huaca Prieta (Bird *et al.*, 1985, p. 99).

The outstanding hallmark of the Late Preceramic Period is the use of cotton textiles (Fig. 8). The appreciation of the accomplishments of Late Preceramic peoples was first stirred by the work of Junius Bird and his assistant, Milica Dimitrijevic Skinner. Careful examination of what, at first glance, appeared to be plain white cotton cloth revealed elaborate designs. Once made of colored yarn which faded, the designs themselves had been twined into the textile and were reconstructed by recording the patterns of the transposed-warp yarns used to make them (Skinner, in Bird *et al.*, 1985, pp. 146–190).

An adequate accounting of the variety of cotton textile techniques would require much more space than allotted here, and detailed discussion is best left to experts in the field. The following represents a summary of some of the significant features of the craft and art of textile work in the Late Preceramic Period. The best discussion is given in Bird *et al.* (1985).

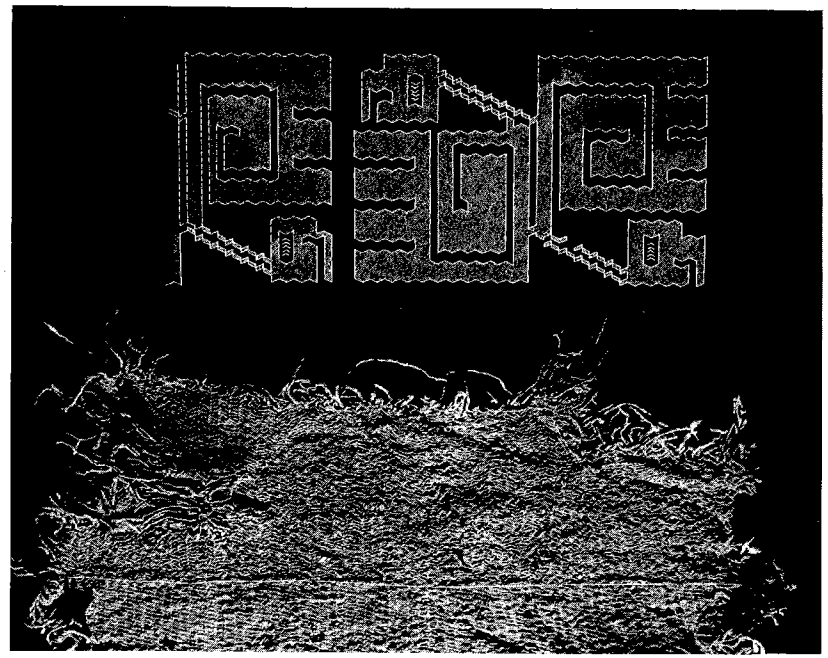

Fig. 8. Cotton textile and its design, found at Huaca Prieta. (Reproduced courtesy of Department of Anthropology, American Museum of Natural History, Cat. No. 41.2/1205.)

Twining, in which weft yarns turn around the warps rather than interlace with them as in weaving, was the predominant Preceramic technique for cotton textiles. Weaving is rare but present in small items, such as belts. Cotton appears to have been used first as wefts in textiles of *junco* and similar materials and then, later, for entire textiles. Different categories of textiles are based on the handling of warps, and the major ones are plain twining, split-pair twining, twining with transposed warps, and twining with supplementary warps (Skinner, in Bird *et al.*, 1985, p. 112). This simple statement does not accurately convey the rich variety of textiles produced, however, especially when additional features such as combinations of techniques (including embroidery), variations in selvage treatment, and pigments, dyes, and design varieties are added.

The most common designs on Preceramic textiles include geometrics such as zigzag bands (Engel, 1963, pp. 33, 35) and geometricized bird, serpent, feline, and human figures (e.g., Grieder, 1988b, pp. 166–181). At Huaca Prieta, rock crabs and shrimp are also depicted (Skinner, in Bird *et al.*, 1985, pp. 146–194). These designs were commonly made by looping at La Galgada and by the use of transposed warps at Huaca Prieta. An Escher-like, interlocking style in which one animal is the mirror image of another and body parts fill spaces

between the openings in another figure is quite common in Late Preceramic textiles, a style which regained popularity in the Early Intermediate Period (ca. 2150 B.P.–1400 B.P.) on the Central Coast. There is enough unity in general designs and techniques to suggest that ideas and technology were shared in a common cultural system throughout much of the Central Andes in the Late Preceramic.

Natural variations in cotton color from white to dark brown were used. Red pigment was observed on textiles from Los Gavilanes (Bonavia, 1982, pp. 104–105) and Río Seco (Wendt, 1976, p. 39), while at least two shades of blue (light, "powder" blue and "navy" blue) and a deep red were found in yarns at El Paraíso. The same colors are reported for Huaca Prieta as well as various shades of brown and tan (Bird *et al.*, 1985,pp. 142–144). These colors were found at La Galgada as well as yellow, which was quite common, and a rare, bright emerald green (Grieder, 1988b, pp. 180–181). Red, orange, and blue colored wool yarn is reported from Asia (Engel, 1963, p. 101).

Finally, feather work, used for spectacular effects in later prehistoric times, first appears in the Late Preceramic Period. Examples of feather working have been found at Asia (Engel, 1963, p. 39, Fig. 80) and as a likely dedicatory offering at Aspero (Feldman, 1980, pp. 135–136, Fig. 37), while feather down was found on floors at La Galgada (Grieder, 1988,pp. 73–75) and at El Paraíso. Birds could have been kept in almost any temperate region of Peru and parrots are known to have occupied the *lomas*. Some of the more exotic plumage, such as the red and yellow feathers found at Aspero, may have been imports from tropical regions.

In summary, Late Preceramic peoples were masters of textile art and had already pioneered many advanced techniques, which were to be elaborated to even greater extents with the introduction of the heddle loom in the Initial Period. These textiles likely served a range of purposes from the utilitarian pursuit of making a living to fulfilling roles as valued prestige goods in social interactions. Variations in techniques and styles that have chronological or regional patterning remain to be studied in depth.

Clothing, Adornment, and Items of Personal Use

Many of the textiles discussed above are represented by fragments. Burial data, especially in evidence at Asia and La Galgada, suggest that many of the items from which such fragments come were cloaks or blankets. No examples of shaped and sewn garments have been reported for Late Preceramic sites, although examples of different cloths sewn together are present (Engel, 1963, p. 40). None of the burials found at La Galgada exhibited the remains of any body clothing other than mantles, mats, large nets, interlaced belts, and head coverings. So, too, no distinct clothing was found at Río Seco, where large numbers of burials were found (Wendt, 1976, p. 40),and at Asia the most com-

xtiles found were large, cloak-like pieces of cloth, belts, and an occasional cap (Engel, 1963).

While Preceramic representations of humans are rare, clay figurines found at Aspero (Feldman, 1980, p. 152, Fig. 40) provide suggestions as to how cloaks may have been worn (Fig. 9). A figurine of a male shows a thigh-length skirt that rises above the waist, with a large band depicted at stomach level. This band may represent a rolled section of a larger cloth. The figure also wears a large, flat-topped hat, apparently with side and back flaps on it, and has braided hair falling down its front to the level of the nipples. It also exhibits a large

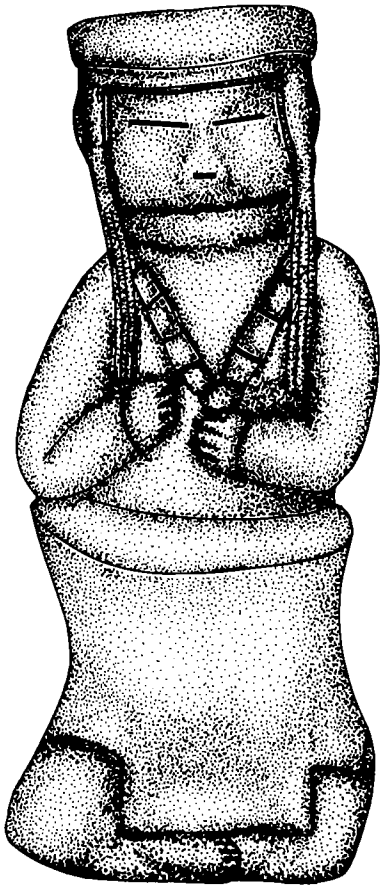

Fig. 9. Aspero figurine. (Reproduced courtesy of Robert A. Feldman.)

necklace of distinctive, rectangular-shaped beads. It is thus likely that the large mantles found in various Preceramic graves were shaped by folding and rolling for different kinds of costume and the belts commonly found in graves may have been used in aid of supporting such apparel.

Other fiber clothing includes sandals (Bird *et al.*, 1985, Fig. 161; Grieder, 1988b, Fig. 98), armbands, and tassels (Engel, 1963, pp. 44–45). Small bags, probably to hold personal belongings, are ubiquitous for the time period. They were specially made and include occasional examples of purse-like objects of sewn barkcloth (Grieder, 1988b, p. 153). The famous Huaca Prieta gourds were found in a small bag in association with a female burial.

Head coverings appear fairly frequently in burials and there are net caps as well as the turban-like hat discussed above. Beaded caps may have been high status items such as one decorated with white beads found at La Galgada (Grieder, 1988, pp. 76, 82). A similar cap, decorated with flat, trapezoid-shaped beads, was found on a young infant placed with other items as an offering at the Huaca de los Sacrificios at Aspero (Feldman, 1980, pp. 114–117).

While the Aspero figurine depicts long, at least partly braided hair, elsewhere hair may have been worn short (Engel, 1963, p. 69), although at La Galgada there is evidence that the hair of burials was cut short at the time of death (Grieder, 1988,p. 75). Grooming was carried out by the use of combs; examples made of rows of huarango or cactus spines bound with cotton yarn have been found (Engel, 1963, p. 60). Skulls are occasionally encountered which appear to have been deliberately deformed, but no detailed studies have been made, and if the practice did exist, it was not widespread. Trephination was observed in two instances at Asia, and one skull had been trephined twice (Engel, 1963, p. 69), but again, the practice was rare. There is no evidence for tattooing in the Late Preceramic, although despite the excellent preservation of organic remains, the recovery of large sections of skin is rare for burials of the time period.

Large bone pins with flat, decorated ends which appear to have been worn in women's hair (Grieder, 1988, Fig. 74) were found at La Galgada. Some of them are inlaid with large pieces of a turquoise-like material, while others are plain or bear geometric incisions. Grieder (1988a, p. 83) notes that while these pins could have served to fasten clothing, none have been found in contexts that indicate this practice. Similar pins of wood and bone have been found at Los Gavilanes (Bonavia, 1982, Foto 27a,b) as well as in the Preceramic Mito Assemblage at Kotosh (Izumi, 1971, Fig. 90).

When the Spanish encountered the Inka nobles they referred to them as *orejones* because of their large ear plugs. Preceramic ear plugs made of wood were found at Asia (Engel, 1963, p. 54) and La Galgada (Grieder, 1988, Fig. 65), and the latter bore traces of white shell glued on its exterior and had a center hole for inclusion of a stone or other material.

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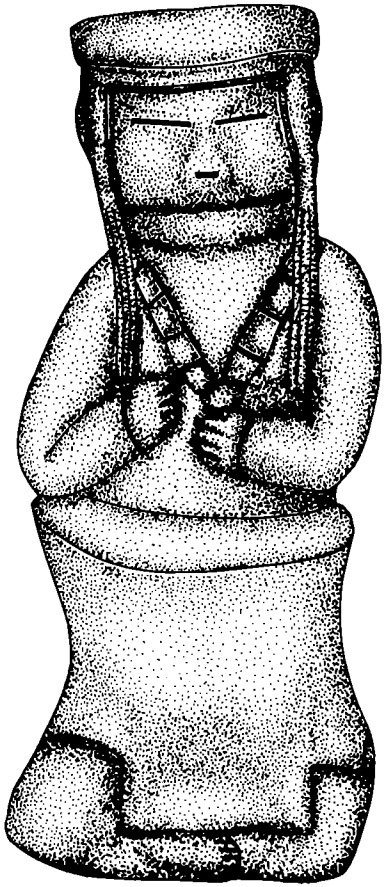

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Other fiber clothing includes sandals (Bird *et al.*, 1985, Fig. 161; Grieder, 1988b, Fig. 98), armbands, and tassels (Engel, 1963, pp. 44–45). Small bags, probably to hold personal belongings, are ubiquitous for the time period. They were specially made and include occasional examples of purse-like objects of sewn barkcloth (Grieder, 1988b, p. 153). The famous Huaca Prieta gourds were found in a small bag in association with a female burial.

Head coverings appear fairly frequently in burials and there are net caps as well as the turban-like hat discussed above. Beaded caps may have been high status items such as one decorated with white beads found at La Galgada (Grieder, 1988, pp. 76, 82). A similar cap, decorated with flat, trapezoid-shaped beads, was found on a young infant placed with other items as an offering at the Huaca de los Sacrificios at Aspero (Feldman, 1980, pp. 114–117).

While the Aspero figurine depicts long, at least partly braided hair, elsewhere hair may have been worn short (Engel, 1963, p. 69), although at La Galgada there is evidence that the hair of burials was cut short at the time of death (Grieder, 1988,p. 75). Grooming was carried out by the use of combs; examples made of rows of huarango or cactus spines bound with cotton yarn have been found (Engel, 1963, p. 60). Skulls are occasionally encountered which appear to have been deliberately deformed, but no detailed studies have been made, and if the practice did exist, it was not widespread. Trephination was observed in two instances at Asia, and one skull had been trephined twice (Engel, 1963, p. 69), but again, the practice was rare. There is no evidence for tattooing in the Late Preceramic, although despite the excellent preservation of organic remains, the recovery of large sections of skin is rare for burials of the time period.

Large bone pins with flat, decorated ends which appear to have been worn in women's hair (Grieder, 1988, Fig. 74) were found at La Galgada. Some of them are inlaid with large pieces of a turquoise-like material, while others are plain or bear geometric incisions. Grieder (1988a, p. 83) notes that while these pins could have served to fasten clothing, none have been found in contexts that indicate this practice. Similar pins of wood and bone have been found at Los Gavilanes (Bonavia, 1982, Foto 27a,b) as well as in the Preceramic Mito Assemblage at Kotosh (Izumi, 1971, Fig. 90).

When the Spanish encountered the Inka nobles they referred to them as *orejones* because of their large ear plugs. Preceramic ear plugs made of wood were found at Asia (Engel, 1963, p. 54) and La Galgada (Grieder, 1988, Fig. 65), and the latter bore traces of white shell glued on its exterior and had a center hole for inclusion of a stone or other material.

There are a wide variety and great number of beads and pendants from Preceramic sites, from simple mollusk shells exhibiting little modification to highly polished and decorative stone beads. As in many cultures, any impressive natural object such as large teeth or claws could be used as decoration. Shell and bone were the most common raw materials for manufactured beads, with stone appearing less frequently. A wide variety of shapes is known, ranging from tubular to disk and other shapes. A necklace made of bone pendants carved to resemble claws was found at La Galgada (Grieder, 1988, Fig. 78). Patterns in bead sizes and materials have yet to be studied in detail and might provide evidence of standardization in exchange systems in Preceramic Peru.

There are rare occurrences of *Spondylus princeps* shells or shell artifacts at Preceramic sites. Today, this thorny oyster with a bright red shell and interior rim is found nearest to Peru in the warm offshore waters of southern Ecuador (Paulsen, 1974), and all indications suggest that its distribution has been constant for at least five millennia. In later Peruvian prehistory *Spondylus* was considered extremely valuable, as food of the gods, and it is almost a certainty that it was also highly valued during the Preceramic. While *Spondylus* is rare at most Preceramic sites, there was a fair amount found in the high status burials at La Galgada (Grieder, 1988a, pp. 94–95), suggesting that it was in circulation, but carefully curated by those lucky enough to own it.

A third highly valued material in Late Preceramic Peru was a red, compacted ferruginous diatomite stone (see Grieder, 1988a, p. 87). It is also infrequently found, but when encountered it is usually carved into distinctive double-holed, rectangular beads with biconvex cross sections. Such beads have been reported for Aspero, Bandurria, Río Seco, and Los Chinos, on the North Coast, and they apparently are depicted on the necklace of the Aspero figurine, discussed above.

No source has yet been identified for this stone. Given its rarity, in addition to the infrequent discovery of artifacts made from it, as well as the distinctive style in which it was carved, it is likely that this bead style was a high prestige item in Late Preceramic Peru. At La Galgada, however, the material was also found in the form of long, curving, flat rectanguloid beads, one of which still contained a circular green stone inlay (Grieder, 1988a, p. 87). The red color of both the diatomite stone and *Spondylus* shells may have been tied to particular religious beliefs found elsewhere in the use of red pigment in burials and offerings and extending well back beyond the Late Preceramic Period. Furthermore, the distinctive biconvex, rectanguloid, double-holed shape of the stone beads is also found in some examples in *Spondylus*, again at La Galgada (Grieder, 1988a, p. 90), suggesting a symbolic relationship of the stone and the shell based in their red coloration. The distinctive bead style appears to have been reserved for only the finest of materials, further suggesting that it was associated with prestige systems.

Raw materials for lapidary work besides those already mentioned included turquoise-like green stones, especially common at La Galgada as inlays. Iron pyrite, anthracite, and, possibly, magnetite as well as material identified as amber were materials used for beads, pendants, inlays, or miscellaneous objects at La Galgada (Grieder, 1988a, p. 83). A dark blue material resembling lapis lazuli has been found as an inlay, probably crushed and mixed with a glue, in two objects at El Paraíso (see Fig. 7). The closest source for lapis, however, is extreme southern Peru or Chile, and it has not been definitively reported as present at Preceramic sites.

In addition to beads, a wide variety of miscellaneous small items is present at Late Preceramic sites. These include an especially fine inlaid shell pendant of a rabbit and outstanding examples of carved and inlaid disks (some of which may be Initial Period) found at La Galgada (Grieder, 1988, pp. 88–94). Some of these may have been fetishes, and unusually shaped natural objects, such as rocks, are reminiscent of *huacas* (sacred objects) described for the Inka. Rock crystal is occasionally found and may have been associated with shamanistic practices.

Mortuary Practices

Compared to Middle Preceramic burials, those of the Late Preceramic exhibit more formalized interment practices and more numerous and elaborate grave goods. Middle Preceramic burials are generally characterized by flexed bodies buried beneath or sometimes on the floor of houses. The dead were usually wrapped in one or more *junco* mats and sometimes finer textiles accompanied by offerings of everyday objects such as textile tools, projectile points, and so forth (Quilter, 1989a). Late Preceramic burials continued the tradition of wrapping the dead in textiles, following a trajectory that led to the elaborate mummies of later prehistory. Another trend that continues from Middle through Late Preceramic is the burial of children, either as offerings, such as at Aspero, or with or near adults in cemetery areas. This practice seems to associate children with concepts associated with fertility (see Quilter, 1989a), which culminated in the use of the young as sacrificial victims during Inka times.

It is surprising and unfortunate that relatively few burials have been found at Late Preceramic sites. Five burials were found at El Paraíso, only one of which was an adult. They were found on floors inside Unit I and the adult was buried below ground next to the front wall of the structure. (Ojeda, personal communication, 1983). Similarly, only a few nondedicatory burials were found at Aspero, where they were found in midden or lying on the floors of buildings (Feldman, 1980, pp. 114–123). Again, at Alto Salaverry, a relatively small site, two burials were found, one in the fill of a platform and the other in domestic refuse (S. Pozorski and T. Pozorski, 1979). What special circumstances, if any, led to the deposition of these dead in locales associated with monumental archi-

tecture or in domestic architecture are, of course, unknown, but no cemetery areas for the population at large have been found for El Paraíso, Aspero, or Alto Salaverry.

The greatest number of burials for a Late Preceramic Site has been found at Asia (Engel, 1963), where 49 funeral bundles were excavated. These were placed below the floor of a rectangular walled compound and treated in generally the same manner as their Middle Preceramic ancestors—flexed bodies wrapped in textiles. The greater number of artifacts, mostly of quotidian nature, may simply be the result of a more sedentary life-style than existed in the Middle Preceramic. However, an analysis of the frequency of textile offerings (Moseley, 1978, p. 13) indicates that a few individuals were given disproportionately more and finer grave goods than the majority of interments. The fact that these richer burials were found in the same structure as those with fewer goods, however, suggests that they represent higher-ranking members of the same social group, probably the inhabitants of the structure in which they were buried. Significantly, what appear to be trophy heads as well as headless bodies were found at this site (Engel, 1963, pp. 94, 99, 100, 115), indicating the earliest evidence for this tradition, as well as indicating raiding or warfare in the region.

Another Late Preceramic site that yielded numerous burials is Río Seco (Wendt, 1964), where 42 burials were found (13 adults, 10 children, 19 infants). Unfortunately, specific details of the location of the human remains excavated at the site, in or near six platform mounds, are not given in the available report. However, Wendt (1976, p. 32) does note that both *Spondylus* and double-holed red beads were found with one burial (or, at most, two).

The remains of 27 adults with an uncertain number of younger individuals ranging from juveniles to young infants were found at La Galgada (Malina, 1988). Most of the adults were extended rather than flexed, and they were placed in finely made stone and adobe chambers that had formerly been used for ceremonial purposes on the summits of two large mounds. Many of the dead appeared to have been arranged in groups of three or more. Specialized mortuary practices are in evidence, such as the cutting of the dead's hair and its placement next to the body in a basket or bag. Rare and fancy artifacts found with the dead, such as inlaid bone pins, stone cups, red double-holed beads, and other items, are evidence, in combination with the special place and mode of burial, that these individuals had high status in the society of their time. The fact that it is unlikely that all of the individuals in any one tomb died simultaneously suggests that the crypts were kept open so that all the members of a kin unit designated to be buried together could be placed in a chamber (Grieder *et al.*, 1988, p. 196), and groups of chambers were stacked on top of one another as the mounds rose through time, as former ceremonial rooms were converted into tombs and new ritual chambers were built above them.

The available data on mortuary practices indicate the development of nonegalitarian social systems in Late Preceramic Peru. While finer chronological controls as well as more burials are necessary to delineate trends and to examine the question of ranking more fully, current evidence suggests that some people had higher status than others. The way in which status was gained and the degree to which status separated an individual who had it from his or her fellows may have varied from place to place or through time. At Asia, it appears that achieved status may have been the rule, while at Río Seco the little evidence available suggests a narrowing of status positions to one or two individuals, although lack of information encourages caution in interpretation.

The La Galgada data are important both because burials were found in monumental architecture and because the information is reported in the greatest detail for any Late Preceramic site with more than a handful of burials. It is significant that numbers of individuals were entombed in ceremonial chambers and that many chambers are found for any one excavation level and for the site as a whole. This suggests that while some members of society had a higher status in life than others and that their high rank was recognized by special funeral arrangements, the focus of power in La Galgada society was not narrowly focused on a small ruling group but likely spread through the senior ranks of important corporate kin groups such as lineages or clans.

This seems especially true from the fact that while the grave goods found with these dead were elaborate for the culture from which they came, these items do not express extraordinary wealth except, perhaps, for access to some exotic goods such as the red stone. So, too, while a comparative sample of human remains from burials not placed in ritual chambers would be useful, and an expert's judgment would help, the robustness of La Galgada male skeletons, signs of arthritis, and other pathologies seem to indicate that the dead in the chambers were not exempt from hard physical labor in their lives. As with so many other aspects of Late Preceramic Peruvian archaeology, future research will be necessary to clarify the evidence for social differences during the time, especially as in evidence through burials.

Summary

Our current view of Late Preceramic achievements shows human societies that had learned to exploit local environments quite successfully and had developed distinct social and ideological means to reproduce themselves and their societies. While much basic descriptive work remains to be done, a chief concern for future work is the delineation of culture change in both temporal and spatial dimensions. To what degree is observed variability real or the result of an incomplete account of the archaeological record? For example, present evidence suggests that long-distance exchange for exotic goods was taking place,

yet subsistence economies appear to have remained relatively localized and slow to change. Additionally, the two great strengths of archaeology in Peru are also potential weaknesses.

First, the excellent preservation of archaeological remains in the coastal environment biases our views of the relative importance of that region as opposed to the highlands, where preservation is not as good. In addition, the ability to recover remains that would have vanished from the archaeological record in other world regions may encourage biases regarding the precociousness of early Peruvian societies. For example, while it is true that textiles played an extremely important role in Peruvian civilization from very early times, this does not necessarily mean that they did not play similar roles in other early societies for which we have proportionately fewer remains to study.

Second, Andeanists have a rich source of ethnohistoric data on the societies that occupied western South America immediately before the Spanish Conquest, especially the Inka. While the Andean region is not unique in the availability of such material, archaeologists working in Peru and neighboring countries commonly attempt to search for the earliest evidence of such things as "verticality" and other organizational and ideological systems known for late prehistoric times. While this is a right and proper thing to do, the danger exists that an overeager search for such systems will blur or distort detection of earlier, different behavioral and ideological patterns before later forms were developed. Despite these caveats, however, few Andeanists would sacrifice the preservational qualities of coastal sites or the ethnohistoric record with an argument that a clearer picture of the past could thus be gained!

THE SOCIAL AND IDEOLOGICAL WORLDS OF LATE PRECERAMIC PERU AND THE SIGNIFICANCE OF CORPORATE ARCHITECTURE

Fewer than a dozen Late Preceramic sites have been investigated to any great extent, and published reports on them vary in the degree of detail presented. Most of this work has concentrated on large-scale architectural complexes. In contrast, few data are available on domestic architecture outside of the context of monumental sites. Attention has been paid to the larger sites, partly because many scholars have thought them to be the first evidence of hierarchized societies in ancient Peru, although the interpretation of such sites is open to debate.

There is a high degree of variability in Late Preceramic monumental architecture and controls for temporal, regional, and social factors that might underlie such differences are poorly developed. Generally, monumental sites used combinations of truncated pyramids, terraces, and sunken pits or courts, often with the use of a ventilated central fire pit, and interplayed rectilineality with

circular and/or rounded architectural concepts. In addition, the spatial arrangement of structures, in relation both to the landscape and to each other are prominent and varied characteristics of Late Preceramic architecture. These architectural canons appear to be elaborations on earlier themes and simpler constructions as in evidence in the upper and middle Zaña Valley on the far North Coast (Dillehay and Netherly, 1983; Dillehay *et al.*, 1989), Piedras Negras, near the Santa Valley in coastal Peru (Deza, 1988), and, perhaps early public constructions in semitropical forest areas such as Real Alto in Ecuador (Lathrap *et al.*, 1977).

The themes found in these early public constructions—terraces, sunken rooms, and infant burials—are elaborated in the Late Preceramic Period. In the Supe Valley, the sites of Piedra Parada and Aspero represent relatively early examples of corporate architecture in the Late Preceramic Period (Feldman, 1980, 1985). Piedra Parada consists of at least four flat-topped mounds, with upper and lower terraces on some mounds and, in front of at least one structure, evidence of a sunken, circular plaza. Aspero has three principal mounds whose sizes are due partly to their construction on top of natural hills, as at Asia (Engel, 1963), where a similar pattern of apparent random placement of mounds is found, and the same holds true for Río Seco (Wendt 1964, 1976), and site CA-09-04 in Zaña (T. Dillehay, personal communication, 1991).

Late and Terminal Preceramic monumental sites generally are arranged in a system of imperfect bilateral symmetry. For example, at Salinas de Chao, a series of terraces ascends the hill slope, with central stairways in Unit B (Alva, 1986), a pattern similar to that found at Huaynuná (T. Pozorski and S. Pozorski, 1990), while at El Paraíso most of the complex forms a rough U shape composed of separate buildings (Figs. 10 and 11). At Salinas de Chao, however, different masses of more or less symmetrical architecture are placed next to each other in less than symmetrical order, and at El Paraíso smaller buildings appear outside of the overall U pattern. These appear to be due to site growth in which the original intent at symmetry was not maintained. At Aspero (Feldman, 1980) the frog bowl and marked sticks offering were found in a pit on an axial line with the infant burial found on the Huaca de Los Sacrificios (Feldman, 1980, pp. 136, 141), even though the overall site plan does not conform to any readily observable organized principle.

At Aspero, the main mounds appear to have been built in locales which take advantage of the heights of hills. However, the principal mounds at both Piedra Parada (Feldman, 1980, p. 98) and El Paraíso (Quilter, 1985, p. 282) are oriented to N 25°E. This alignment oriented the sites toward the NE and SW maxima of the Milky Way, and the axis perpendicular to this orientation is directed to the rising of the sun at the Summer Solstice (December) in the east and the setting of the sun of the Winter Solstice (June) to the west as calculated for the years ca. 3450 B.P. (Urton, personal communication, 1991). This sug-

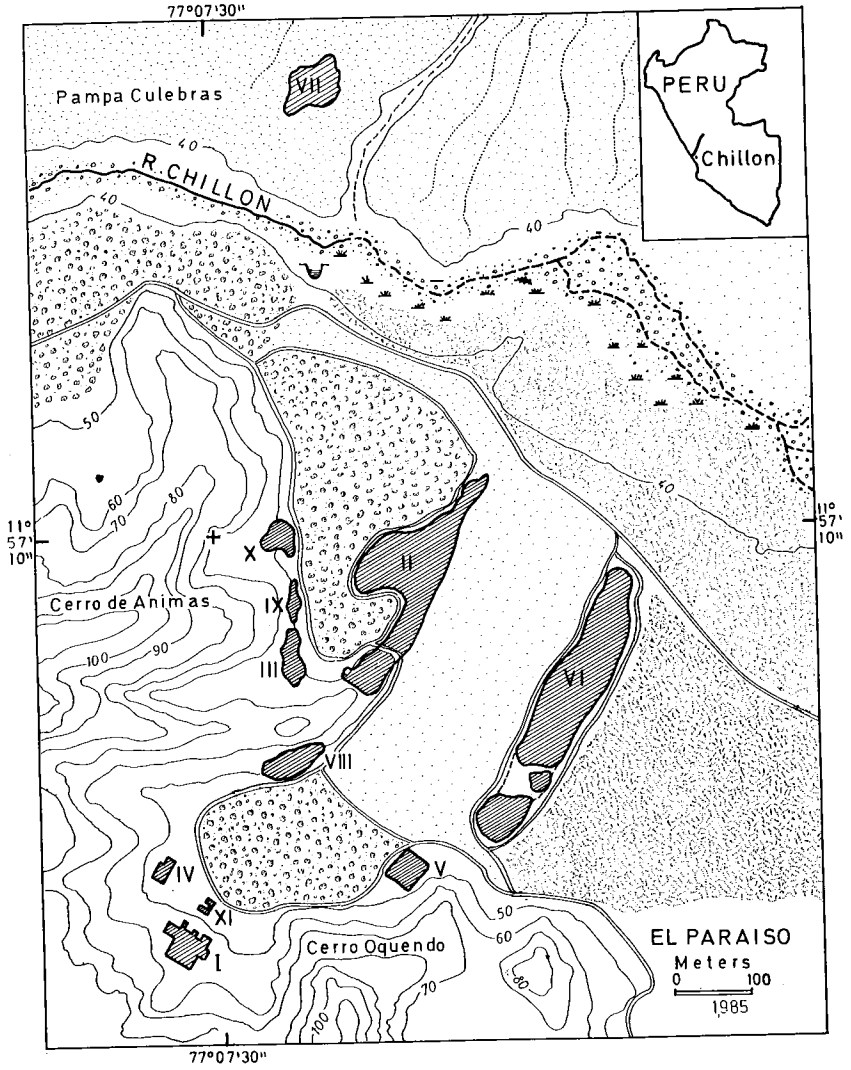

Fig. 10. Map of El Paraíso.

gests that astrocosmological concepts known to have been important for the Inka were established in Preceramic times. Other sites, however, appear to have had different orientations (cf. Carlos Williams, 1980, 1985). At Kotosh, Late Preceramic (Mito) temples are oriented to north and south, while at Huaricoto ceremonial hearths appear to point up or down the valley or, possibly, to snow-capped mountain peaks (Burger and Salazar-Burger, 1986, pp. 75–76).

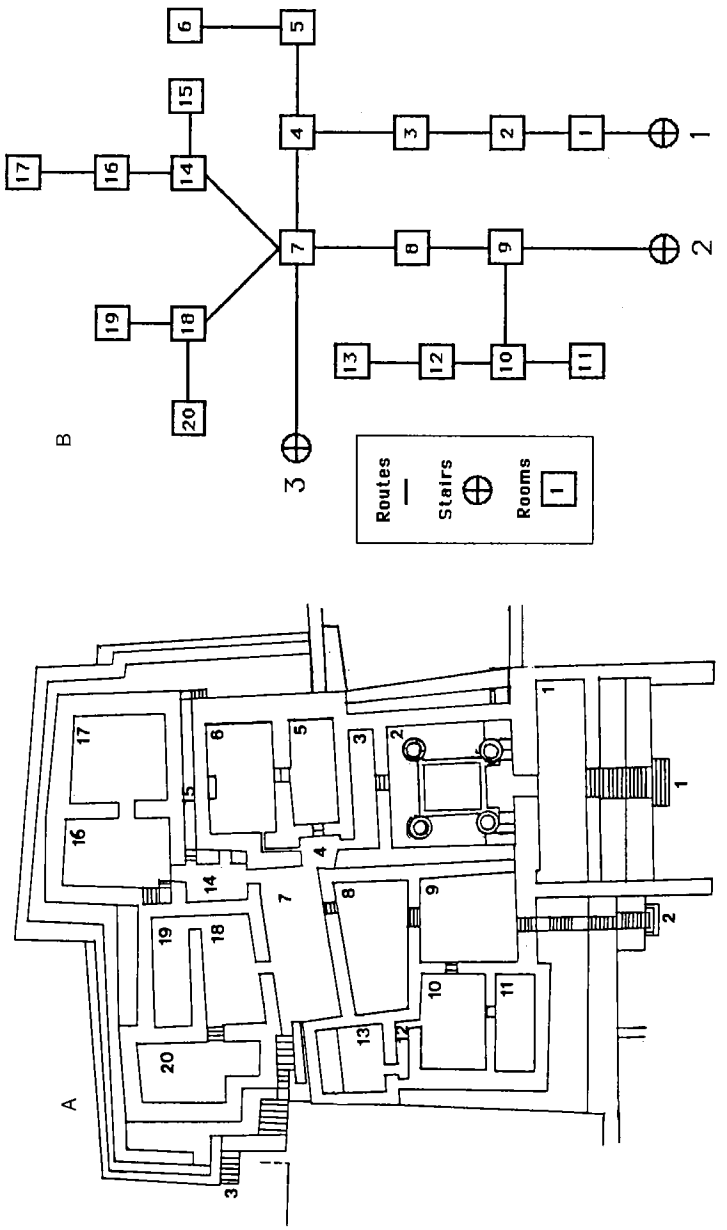

Fig. 11. (A) Plan of Unit I, El Paraíso. (B) Communication routes in Unit I, El Paraíso.

Trends in architectural styles are not entirely clear. Burger and Salazar-Burger (1985, p. 134) note that at Huaricoto larger and more substantial ritual chambers were built through time, but these trends are not unilinear. The same pattern holds true for La Galgada, although in the final stages of occupation, in the early Initial Period, separate chambers in the biggest (North) mound were replaced by a U-shaped temple complex with elevated platforms on three sides, and a similar pattern may have occurred in the South Mound, although the preservation of the final building stages was not as good as that in the larger building (Grieder and Mendoza, 1988, pp. 43–67). Aspero is one of the oldest monumental sites excavated and so the use of natural hills might be interpreted as an early technique in mound construction. However, the dates for Asia, where the same technique was employed, are among the latest for Late Preceramic sites, although only one of several mounds was excavated, leaving the question of the date for original construction open. There does appear to be increasing symmetry of rooms and larger central rooms employed in Late Preceramic—Initial Period architecture through time, such as can be seen in the sites excavated in the Casma Valley (S. Pozorski and T. Pozorski, 1987; T. Pozorski and S. Pozorski, 1990), but there appear to be exceptions, and only future work will be able to clarify what is now a rather complicated picture of variability.

The use of sunken plazas, courts, or floors is a major element in Late Preceramic architecture. Richard Burger and Lucy Salazar-Burger (1980, 1985, 1986) have identified the Kotosh Religious Tradition as the religious system which was the principle on which much of Late Preceramic and early Initial Period architecture was built. The religion expressed itself in the construction of ceremonial hearths commonly sunken below the surrounding floor level of an enclosing chamber (Fig. 12) and measuring between 3 and 7 m in maximum width. This area was sacred and kept clean of everyday materials, while offerings were placed in the fire during rituals. As noted above, an essential part of the Kotosh Religious Tradition was the deliberate closing and sealing of ritual chambers and the construction of new ones on top of them. At La Galgada the sealing of chambers was linked to mortuary practices during the heyday of the site, while at Huaricoto and Kotosh its chambers were never used for such purposes.

Evidence for the practice of the Kotosh Religious Tradition is found at many sites, especially in the Peruvian highlands. Elsewhere, religious architecture sometimes appears to represent variations or outgrowths of the Kotosh system. For example, at El Paraíso, Unit I has a large sunken, almost square, pit (4.5 × 4.25 m), the floor of which shows considerable burning, as opposed to the smaller multiple hearths of ovoid form found at Huaricoto or the circular hearth in a sunken rectangular form found at the type site. It has been suggested that the Kotosh Religious Tradition was widespread and practiced at major ceremonial centers but later maintained only as a "Little Tradition" at small sites,

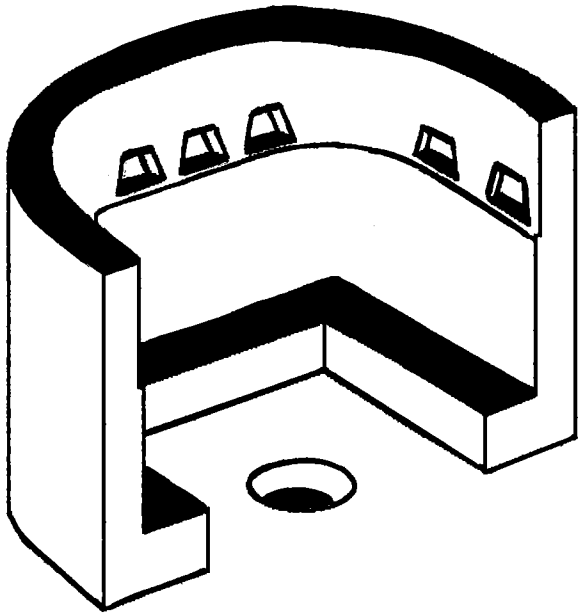

Fig. 12. Cut-away view of stylized Kotosh Religious Tradition ritual chamber.

such as Huaricoto, while the "Great Tradition" of large centers developed new ideologies and forms of worship (Burger and Salazar-Burger, 1980).

The activities that took place inside the ceremonial chambers involved a number of people gathered around a central fire and making offerings. The fact that benches are quite common in these structures suggests that the ceremonialism carried out in them took place over a fairly long period of time—probably several hours, if accommodation was made for seating. Given the dimensions of the benches in chambers reported for the various sites in which they occur, a maximum of 10 or 12 adults probably could have been seated in an average chamber, although there is variability in the size of these rooms and different sizes may be related to groups of different sizes that met in them.

Offerings found in hearths at Huaricoto included marine shell, meat, and clear quartz (Burger and Salazar-Burger, 1985, p. 121). Sacrality may have been confirmed through the sprinkling of bird down as found on floors at La Galgada and at El Paraíso. Graffiti found on walls at El Paraíso, Cardal (Burger and Burger, 1990), and (Early Horizon) Batán Grande (Shimada, 1986, pp. 177–180) suggest that they may have been the result of religious activity, perhaps done during a drug-influenced state. Snuff trays are found at Preceramic sites, and coca and alcohol were used for rites in later prehistory, so it is likely

that participants in rituals were under the influence of drugs; it has also been suggested that chilis were fed to fires to produce tears symbolic of water and its regenerative properties (Grieder and Bueno Mendoza, 1985, p. 107). The presence of nonutilitarian canals adjacent to hearths at Huaricoto indicates that rites to control water and agricultural activity may have been tied to the activities in rooms at some sites (Burger and Salazar-Burger, 1985, p. 129).

There is no overt iconographic symbolism in the form of paintings or friezes in these ceremonial chambers. One exception to this is the Templo de Los Manos Cruzados at Kotosh, which contains a pair of molded clay crossed arms below niches on each side of the doorway flanking the rectangular chamber. The variation of left arm over right and the reverse in the pair is an example of the complimentary and opposing nature of religious symbolism commonly found in the Andes and elsewhere. In the Templo Blanco at Kotosh small, crude, anthropomorphic figurines, a small vessel, and a small object resembling a gourd or squash, all made of unbaked clay, were found in niches (Izumi, 1971, p. 64). They were likely used in association with the rituals carried out in the chamber and probably associated with rites of regeneration and fertility, as also is in evidence by child burials at Aspero and Piedras Negras. Ceremonial articles were on a small, personal scale, appropriate to the small size of the group involved in the ceremony, rather than large public symbols. Social solidarity was reinforced through personal communication and the intimacy of sharing a sacred experience rather than through appeal to an objectified social reality projected outward, as separate from the people themselves who were involved in rituals, as is the case in monumental works of art.

The large size of monumental sites has led to the inference that centralized planning was essential to their construction, and this centralized planning is usually assumed to indicate the existence of a ranked or stratified society. But it also has been suggested that a dozen people working full-time could have built a Kotosh temple in less than a month (Burger and Salazar-Burger, 1986, p. 71), while millions of person-hours were needed to build large centers (Ravines, 1979; Patterson, 1985, p. 66).

An important issue that remains to be addressed with regard to the construction and use of public architecture is the number of buildings and amount of space used at any one time in the history of a site. As archaeologists we are looking at the final building stages of most structures and they are more impressive than a site may have appeared at any time during most of its use. Without doubt, planning and organization of labor were necessary for construction of the impressive edifices of the Terminal Preceramic but the critical question for understanding the social implications of the architecture is how highly organized and hierarchized such systems were.

At present, little has been done to examine the ways in which labor might

have been organized in the building of sites. The apparent use of standardized measures and, perhaps, weights has already been raised, but such systems do not necessarily indicate social hierarchy. It has been suggested that *shicra* were used as a means of labor tax (Feldman, 1980, p. 212), a proposition that assumes or implies an overarching hierarchy. There is no evidence other than the bags themselves, however, to demonstrate that a count may have been kept of the rate of work. The likelihood that rooms were filled with bags of different average weights may suggest that relatively small social units were responsible for filling individual rooms. If the rooms were the habitations or ceremonial quarters associated with such kin groups, as appears likely at least for chambers of the Kotosh Religious Tradition, filling could have been accomplished without much of a centralized, higher authority giving orders.

Differing weights of *shicra* may actually indicate that each worker used whatever volume of stone was most comfortable to move. If track was being kept of the amount of labor being done by individuals or groups, it may have been on the basis of tasks, such as the filling-in of a room, rather than in the number of bags made or hours on the job. In addition, Bernardino Ojeda (personal communication, 1983) has noted that the method of tying bags, by twisting *junco* cords around one another, is such that the *shicra* could not have been easily made before they were filled with stone. Fibers were gathered from marsh areas, brought to the quarry, and then twisted around the stones as they were placed in the mesh, so that the bag and its fill were assembled simultaneously. While a number of alternative methods are possible, the most efficient arrangement of labor for these tasks might be to have separate work crews specializing in quarrying the stone, making bags, and carrying them to the room to be filled. While carriers could help in making bags, efficiency would be greatest if they only carried *shicra*. This organization of labor could lend itself to one in which the strongest adult males served as carriers, women and perhaps children made bags, and older men quarried stone. While it never may be possible to demonstrate that this system was in effect, it does suggest how labor could have been organized on a family or corporate kin-group level without the need for a highly structured social system (see Burger and Salazar-Burger, 1986; Dillehay, 1990).

At El Paraíso a large stone accompanied by offerings was found enclosed in a wall in Unit I (Fig. 11) (Engel, 1966a, p. 68). The stone resembles Inka *huacas*, which were rocks or other natural objects commonly believed to represent corporate group ancestors. The El Paraíso stone was covered in red pigment and wrapped with cotton cloth. Accompanying it were gourd bowls filled with food and a miniature *shicra*. Instead of stones, the bag was filled with ovoid white cakes wrapped in leaves. Analysis of these materials by myself and Dean Katahira of the Ripon College Department of Chemistry has revealed that

the cakes are composed of lime. The leaves are definitely not coca, and although they resemble small *pacae* leaves, no sure identification of them has been made to date.

This El Paraíso offering presents a number of important points for consideration. First, it establishes a clear precedent for the concept and form of *huacas* as found in later prehistory. Second, it suggests that some form of leaf chewing with lime as an agent likely was in use before the widespread adoption of coca. Finally, it suggests that the corporate enterprise of constructing monumental sites was imbued with an aura of sacrality. The miniature bag is a symbolic statement of the relationship between human labor and ritual concerns, perhaps in the same way that ceremonial chrome shovels are used for ground-breaking by dignitaries in the inauguration of modern buildings—an instrument of labor is given embellishment for ritual use.

While the organization of the filling of rooms may be open to debate, the reason for filling them merits consideration. All large architectural complexes apparently went through the process of enclosure of old structures and rebuilding on top of them, a practice that continued at least into the Early Horizon (Burger and Salazar-Burger, 1980; Shimada *et al.*, 1982). It is reminiscent of temple rebuilding in Mesoamerica and, like it, was probably tied to concepts of renewal and perhaps associated with calendrical events.

But while they consumed a great deal of surplus labor, these activities did not necessarily require a highly ranked social hierarchy and could have been built through lineage or clan systems without the need of the single overarching authority of a state system. Large pueblos in New Mexico and Arizona might easily be viewed as "monumental architecture" requiring highly organized social systems to build and maintain them if ethnographic sources were not available to tell us otherwise. When hierarchy is indeed manifest in later prehistory "temple burial" (Izumi and Terada, 1972, p. 176) was less important than temple expansion and associated ideological concepts may have shifted from maintenance and renewal to growth and development.

Given the size and arrangement of some Late Preceramic buildings, it is probable that larger, community-oriented ceremonies did take place, but the overall emphasis for many sites appears to have been the ritual activities of smaller groups. There is not even a clear pattern of arrangement of the separate ritual chambers within the larger site plans at Kotosh or La Galgada, suggesting that the social relations between the groups represented by such structures were also not highly formalized. But burial in a chamber in a larger structure shows a shift in ideology from the Middle Preceramic custom of house burial (Quilter 1989a). Individuals were beginning to be thought of somewhat less in terms of their specific place of residence and their immediate kin but with the symbolic representation of their corporate kin group—the subterranean chamber—and this group and chamber were contained within the larger context of the monumental

structure and what it represented. Furthermore, the fact that no burials were found in chambers at Kotosh, Huaricoto, or the earliest levels at La Galgada is of interest. At La Galgada, sacred spaces that formerly (and, apparently, elsewhere) remained empty at the end of their uses and the beginning of new building phases were later appropriated as sepulchers for emerging power groups in the sociopolitical system: a once relatively egalitarian religion was being manipulated by high-status groups in a more ranked social system. The fact that this custom was not adopted at Huaricoto or Kotosh suggests that the emergence of more ranked social systems in their regions may have occurred or were expressed in different ways.

Other Late Preceramic sites do not share the pattern of Kotosh Religious Tradition architecture, suggesting different social forms were in operation. The organization of rooms revealed for the last occupation of Unit I at El Paraíso is suggestive of changing sociopolitical structures (Figs. 10 and 11). A suite of ceremonial rooms (Fig. 11A, 2, 3), which was originally closed off from the rest of the chambers and may have even once been part of a separate building, was linked to the rest of the complex. The pattern of movement possible in the structure during its latest period of use was such that the interior chambers were accessible from three separate outside entries (Fig. 11, 7). The single ceremonial chamber indicates a very different pattern of ceremonialism than the multiple rooms at La Galgada, suggesting a narrowing or concentration of activities, at least for those who used this one building among many. At the same time, however, there is potentially great freedom of movement both into the building and within it (Chiswell, personal communication, 1990). The architectural evidence may represent a focusing of authority or power within a narrower social circle, although one which still remained relatively open in terms of its relation to other individuals and groups.

By the early Initial Period, the site of Cardal shows a standard "U" shape,while its arms are filled with sunken circular plazas (Burger and Salazar-Burger, 1990). This suggests that the organizing principles at similar sites were considerably different from that shown at Preceramic La Galgada. The overarching principles which bound early Initial sites of the U form may have been such that they were seen as something qualitatively different from the sum of parts or the small social unit writ large. A different approach, but perhaps meeting similar ends, is to be found in Casma (S. Pozorski and T. Pozorski, 1987), where an early Initial Period structure, Huaca A, is more symmetrically organized than El Paraíso and is fronted, in the distance, by the mound of Moxeke, which advertises its ceremonialism through the use of greater height and elaborately molded and painted public art. But it does not appear that one religious tradition, at least as evidenced by architecture, simply succeeded the other. Sunken courts, terraces, truncated pyramids, use of topographical features, circles, rectangles, and squares remain in constant use throughout Andean prehis-

tory. Peruvian ceremonialism and religion are marked by continuity perhaps more than by change, and the process of culture change is more one of the transformation and reinterpretation of older traditions, for the most part and with some notable exceptions, than the complete replacement of one system by another.

Despite differences in ceremonial architecture in Late Preceramic Peru, dualism is a common organizing principle such as in two ceremonial structures at La Galgada, the pair of crossed arms at Kotosh, and symmetrical designs in cotton textiles. The binary structure of community organization expressed in later prehistory (though sometimes manifest in asymmetrical power relations) may have already have been in operation on some level during the Late Preceramic Period.

Many questions remain to be addressed regarding the social and ideological systems of Late Preceramic Peru. The origin, spread, and possible diversification of the Kotosh Religious Tradition remain to be explored. General regional and temporal patterns in public architecture are only faintly outlined at present. A clearer picture of Late Preceramic centers in the highlands is very much needed. Whereas on the coast, Late Preceramic sites were apparently abandoned, the locales of contemporary sites in the highlands remained important so that they were repeatedly built upon, obscuring earlier structures. This suggests not only that different cultural processes may have been taking place in sierra and coast but also that the roles of such centers may have differed, and, of course, there were likely different kinds of centers on an intraregional level as well. Finally, Peruvianist archaeologists discuss "centers" in great detail but we have very little information currently available on the nature and number of noncenter sites. Future work on these issues will considerably advance the study of the sociopolitical and economic roles of public architecture in Late Preceramic Peru.

CULTURE PROCESSES IN LATE PRECERAMIC PERU

The late 1940s and 1950s witnessed the discovery of Late Preceramic achievements. The 1960s and 1970s saw development of a model to explain them. Lanning (1963) first proposed that the *lomas* dried up near the end of the Middle Preceramic. This forced populations into the river valleys and along the coast and fostered specialized farming and fishing communities. Large monumental centers were thus seen as central places that facilitated economic interchange between fishing communities spread out linearly along the coast and the perpendicular line of farming villages running up the coastal valleys (Lanning, 1967, p. 71).

The Maritime–Terrestrial Debate focused attention on an important aspect of Late Preceramic Peru, but other issues received less attention than they

deserved. Research suggested that the *lomas* may have been overexploited by humans rather than desiccated due to climatic change (see Quilter, 1989a, p. 23). Excavations that were carried out at monumental architectural centers tended to focus on the tops of pyramids and similar structures, and thus the integrative role of religion in the regional system was emphasized, but the precise role or use of the complexes was uncertain.

Few large-scale excavations of Late Preceramic monumental sites have been accomplished. However, a number of smaller, separate studies have been made which, when taken together, offer a fundamentally different picture of the nature of large Late Preceramic sites and of the processes by which they came about from the model developed 20 years ago. The change in perspective is due to new information regarding the nature of the monumental architectural sites, their relationship to small settlements in their regions, Preceramic subsistence economies, and analysis of *lomas* degradation. Much of this model has been developed through my own work at El Paraíso, review of previous studies in the region, and a study of available information on settlement patterns for the Late Preceramic (Quilter, 1989b).

The discovery of buried, burned midden at El Paraíso suggests that a larger resident population may have been at the site than previously thought. In addition, the total number of potentially contemporary sites in the greater El Paraíso region is very low, and a review of the available calibrated radiocarbon dates suggests that some of them may indeed not be contemporary with the large monumental site. If contemporary sites exist, they may be under later occupations or buried in the floodplain, but for now, they are rare to absent from the archaeological record. In short, a review of the evidence suggests that there may be fewer outlying, small communities and more people at El Paraíso than previously thought. Indeed, the major population center in the region was probably El Paraíso, and there is considerable evidence that other monumental sites supported large resident populations such as Asia, Aspero, Los Gavilanes, Huaynuná, and Río Seco.

El Paraíso's role as a population center is further supported by the fact that rocky-shore mollusks appear to be considerably underrepresented in the refuse of the site in terms of the amount of meat that they contributed to the diet in relation to sandy shore species (Quilter *et al.*, 1991). Sandy beaches are closest to El Paraíso, but one would expect a fairly significant showing of rocky shore mollusks in trash deposits if the site had functioned as a regional center, even though mollusks in general played a relatively minor role in the diet. The fact that rocky-shore mollusks are proportionately insignificant as food suggests that the people of the site relied more upon shellfish from nearby beaches and that there were few people in outlying communities bringing mollusks from rocky shores to El Paraíso. The relatively simple subsistence economy of El Paraíso, not much different from that of earlier times, also diminishes a view that would

attempt to place it as a qualitatively different social entity than a large, relatively egalitarian community.

A review of settlement data adds one more perspective to understanding the reasons for the establishment of large monumental Preceramic sites on the Central and North coasts of Peru: the South Coast has no such sites for the time period. Part of this might be due to the fact that the coastal topography south of Lurín does not lend itself to many large valleys which have wide floodplains, as exist north of it. But this answer is not entirely satisfactory, since some do, such as Chincha and Cañete.

Furthermore, even though there are no *large* Late Preceramic sites, there are sites of the period on the South Coast, but mostly they are in the *lomas* (Quilter, 1989b), at least according to the data available (Engel, 1980, 1984). Thus, we are faced with the likelihood that if the *lomas* continued to thrive on the South Coast during the Late Preceramic, they also did so on the Central and North coasts as well. This does not necessarily preclude the possibility that some sort of environmental degradation occurred near the end of the Middle Preceramic Period, but it suggests that if it did happen, the *lomas* likely rejuvenated rather quickly; the fact that *lomas* plants have been found in the El Paraíso midden is at least one indication that the *lomas* did indeed continue to exist in the Late Preceramic.

If the above is correct, then *lomas* degradation cannot be easily ascribed the role of prime mover in the intensive occupation of the Central Coast river valleys during the Late Preceramic. At best, it might be relegated to an initial "kick" that sent cultural processes more rapidly down a path in which they were already headed. If so, then we are left with the question of why people moved from relatively productive occupation of the *lomas* to intensive and concentrated settlements in river valleys, such as at El Paraíso, where they apparently continued a subsistence economy (at least, initially) not too much different from one they had pursued in the fog fields.

Cotton production could be carried out to any significant extent only in the river valleys. There is a veritable explosion of designs and technical devices in cotton in the Late Preceramic, and it has already been shown how cotton played such an important role in prestige systems and life in general in the time period. At present, studies are insufficient to identify clearly regional styles and temporal variations in textile arts. What can be said, however, is that fancy textiles were made even at little, out-of-the-way fishing villages, such as Huaca Prieta (Bird *et al.*, 1985), as well as at large architectural complexes that were not located in ideal locales for the growing of great amounts of cotton, such as La Galgada (Grieder *et al.*, 1988).

La Galgada is an interesting case in point. It is a large architectural complex which clearly utilized ceremonialism as a means of developing and maintaining its importance. Its location, up-valley in the rain shadow of the western slopes of the Andes, suggests that irrigation agriculture was likely in use. Even with irrigation, however, it would have had severe limitations imposed on it with regard to the amount of agricultural goods it could have produced. But it was in an ideal location to capitalize on interregional exchange, especially between the coast and the highlands.

Lack of studies at higher elevations impedes development of a clear understanding of interregional exchange systems, and the preservation of cotton textiles would be a rarity in many areas of the sierra. Given the different environments and resources of high- and low-altitude zones, the logical assumption is that exchange would have included subsistence items. As noted above, obsidian is rare on the Central and North coasts but was actively exchanged within the highlands and to the South coast. Wool is present but relatively rare on the coast (see Bonavia, 1982, p. 201). On the other hand, evidence is available that maritime products such as shellfish and, likely, less well-preserved fish, salt, seaweed (Burger, 1985, pp. 276–277), and other foods were making their way from coast to highlands. Tubers found at Ancón probably were grown in the highlands and reached the coastal site through exchange systems (see Moseley, 1985, p. 41).

There is clearer evidence of long-distance exchange for what were likely prestige goods. These include items already mentioned such as tropical bird feathers and a variety of stone objects, including bowls, mortars, grinding stones, and the distinct, biconvex, double-holed red beads. Other semiprecious stones, obsidian, and miscellaneous goods also suggest long-distance contacts and there were likely many other goods, both durable and perishable, which were exchanged between the diverse ecological zones of the central Andes.

This is not to say that cotton production and exchange systems should be viewed as the primary factors in the transformation of early Peruvian society. Theoretically, at least, cotton production might have been successful with dispersed settlement patterns, without the need for centers such as El Paraíso or La Galgada. On the other hand, such central nodes in exchange systems may have been encouraged if the emphasis on exchange was interregional rather than intraregional. The increase in status items such as fancy stone cups or beads is part of larger social processes, however, and given the current available evidence, it seems that the dynamics of social change in Late Preceramic Peru were centered in competition between kin groups rather than social classes. Much of this same social system appears to have continued into the Initial Period, with growing emphasis on public displays of authority (e.g., Burger and Salazar-Burger, 1990) at monumental sites and, probably, monopolization of power by fewer kin groups than in the more open, fluid social dynamics of the Late Preceramic. Perhaps a model of long-distance exchange of relatively

few luxury items between senior members of corporate kin groups might also explain why subsistence systems were relatively conservative, including use of new domesticates.

How such dynamics worked in the social transformations that took place in the Terminal Preceramic remain to be investigated in depth. At least part of the answer may lie in a better understanding of events occurring on the periphery of the Central Andes, in Ecuador, Chile, northwest Argentina, and Bolivia. For some time it has been noted that Ecuador (and Colombia) was "precocious" in the implementation of ceramic technology, with the development of sophisticated pottery styles long before their adoption in the Peruvian heartland (e.g., Lathrap *et al.*, 1975, p. 53), and Ecuadorian influence or even direct trade is in evidence in the carving styles of the Huaca Prieta gourds (Lathrap *et al.*, 1975, p. 110, Fig. 593). New evidence from Chile suggests the possibility of cotton domestication and other intensification of labor at a very early time (Rivera, 1991). There is also possible evidence of population movements over vast areas of South America, from tropical forest regions to the altiplano and coastal desert (Rivera, 1984), rekindling an interest in the significance of migration and its causes as a factor in explaining prehistory. Many areas that were little explored or poorly reported are now revealing evidence of dense early human populations, including lowland eastern Bolivia (Erickson, 1991). Continent-wide or even larger vistas are commonly used to discuss the Old World past, such as the origins of Neolithic cultures or the barbarian migrations at the end of the Roman Empire, and we may be soon approaching South American prehistory with similar perspectives.

For the present, however, the chief topic disputed by students of the Late Preceramic involves a shift in the Maritime–Terrestrial debate from a discussion concentrating on the nature of subsistence economies to the central question that first sparked discussion—the origin of the state.

One group of scholars argues for "complex preceramic antecedents" occurring before the emergence of "theocratic" states first in evidence in the Casma Valley (S. Pozorski, 1987, pp. 18, 21). This view sees the state occurring after the adoption of irrigation agriculture, and it relies upon models developed by Robert Carneiro (1970) on the importance of environmental circumscription and the role of warfare (Haas, 1987; S. Pozorski, 1987). This school of thought also cites the impressive monumentality and complexity of Terminal Preceramic and Initial Period architecture as evidence for social hierarchy (S. Pozorski, 1987, p. 20), claims the existence of an Initial Period site hierarchy in Casma of at least three levels (S. Pozorski, 1987, p. 23), and accepts radiocarbon dates as sensitive enough to distinguish between prehistoric events occurring in different parts of Peru by as little as two centuries (T. Pozorski and S. Pozorski, 1990, p. 23).

The liberal interpretation of Terminal Preceramic and Initial Period culture histories and processes is countered by a more conservative view, and even a less than fully attentive reader probably will have inferred by this point that I am among those with such a perspective. While it is possible that there was considerable diversity in social formations during the time period in question and that some populations in some regions may have been more hierarchically organized than others, the conservative view holds that there is no secure evidence of the state in Peru until much later in prehistory, and personally, I believe that it is not until the Early Intermediate Period that there is conclusive evidence for states in Peru.

More luxury trade items in the Late Preceramic do suggest that increased ranking of social units and probably individuals in them was occurring (see Feldman, 1987, p. 13). Despite the excellent preservation of the Peruvian coast however, burial data, one of the chief sources of information on social organization, are relatively scarce. Where it does exist, such as at La Galgada (Grieder *et al.*, 1988), the emphasis appears to be on many groups of individuals rather than what might be interpreted as a royal family or similar small and distinctively elite group. At Initial Period Cardal, large numbers of burials were recently discovered (Burger, 1991) in impressive architecture but few signs of the kinds of high-status markers one would associate with an elite group were found.

As noted above, the large-scale architecture and other rich data recovered from coastal Peruvian sites might very well impress archaeologists more because of preservation factors, leading to assumptions of complexity that either might equally apply elsewhere if preservation were as good or allow for exaggerated views of the past because of the wealth of data. In addition, the conservative view of the Terminal Preceramic and Initial Period distrusts reliance on radiocarbon dates to sharply separate past events (see S. Pozorski and T. Pozorski, 1990, 1991; Quilter, 1991). This distrust is due to the fact that public architecture sites are huge, thus creating sampling problems, because large sites were subject to multiple rebuilding stages that often included using midden and other old material for fill, and because confidence ranges for radiocarbon dates still require significant lengths of time that are inadequate or inappropriate to use for making fine-grained chronologies. Such distrust also leads to uncertainty regarding settlement hierarchies and sequences of events on either local or interregional levels.

As a summary of current knowledge of Late Preceramic Peru, it is both impossible and inappropriate to present here all of the nuances and implications of arguments on the origins of the state in Peru. In conclusion, it can be said that considerable progress has been made in advancing knowledge from the recognition of the time period's existence and importance less than half a cen-

tury ago to providing a general view of the substance and diversity of the accomplishments of ancient peoples of the time and region. Future studies will certainly clarify many current controversies and provide new ones.

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