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Pernil Alto: an agricultural village of the Middle Archaic Period in Southern Peru

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13 Dwellings

The 18 structures of the Middle Archaic occupation at Pernil Alto can be characterized in general as semi-subterranean pit dwellings. The only exception is structure 17, which does not show a distinct pit. It seems that a natural step within the inclination was used in this case and the only surface shaping, indicating a "half-pit", was made in its northern part. The sizes of the floors of the excavated parts of the pits vary between 1.7 m² (structure 6) and 12.3 m² (structure 17). If the incomplete pits that were either destroyed to a large extent (structure 6) or could not be excavated completely (structures 12 and 13) are excluded, the size variation is reduced to a range between 3.2 m² (structure 8) and 12.3 m² (structure 17). This variation would include structures 1, 7, and 4 which were partly disturbed by later intrusions of the Initial Period settlement. However, these disturbances did not disturb the pits of those structures and thus the floor sizes can be included. The average floor size of a dwelling would then be 5.1 m², but the size of structure 17 is exceptional and was 4.3 m² larger than the next smaller floor size (8 m² of structure 14). If, therefore, the floor size of structure 17 is excluded, the average floor size of a dwelling was 4.6 m² which can be interpreted as an ideal standard size. Nevertheless, the variation is relatively high.

The ground forms of the dwellings were circular (n = 4) or oval (n = 10) within the dwellings that were preserved or excavated completely. The forms of the not completely preserved or excavated dwellings are not clearly determinable. It seems that structures 6 and 13 could have been circular, whereas structure 12 was probably oval. But their exact forms remain unknown. A chi-square-test to test if one of the forms "oval" or "circular" were preferred is not executable due to the small number (n = 14) of known dwelling forms. Nevertheless, of the known forms a clear tendency towards oval forms (71.4 %) is recognizable. Thus an ideal dwelling would have been of oval ground form with a floor space of 4.6 m².

Most of the dwellings (n = 12) were used as burial areas after their function as dwellings, as indicated by the stratigraphic information. Burials inside dwelling or hut remains were seemingly common during the Middle Archaic on the Central Andean coast. In La Paloma, a settlement on the central Peruvian coast, the individuals were buried inside many of the dwelling remains or close by (Benfer 1999: 224). In Chilca, a settlement close to La Paloma, the individuals were also buried within the dwellings (Donnan 1964; Engel 1987b, 1988a). From the latter one, dwelling 12 was published in detail (Donnan 1964). Seven individuals were deposited on the floor of the dwelling, of which only one could have had a burial pit (Donnan 1964: 138). The roof of the dwelling was than intentionally collapsed and the roof remains were ballasted with grinding stones (Engel 1987a: 44). This indicates that even in Chilca the burials were deposited in the dwelling after it was abandoned. In the site of Paracas 514, located on the Paracas Peninsula, burials were also deposited within dwelling remains (Engel 1987a: 56). On the Southern Ecuadorian coast the concentration of burials within circular structures is interpreted as burials within a circular dwelling (Malpass/Stothert 1992: 140). On the other hand, burials within dwellings were seemingly not common during the Preceramic Period on the Northern Chilean coast. Only in the site of Caleta Huelén 42, which dates to the fifth millennium BP, were some burials detected below the floors of oval dwellings (Zlatar 1983).

Within the Central Andean highlands it was not common to bury individuals within dwellings, as the results from the open-air site of Asana in the Southern Peruvian highlands (Aldenderfer 1988, 1990, 1991, 1998), the caves of Quiqche and Tres Ventanas in the Central Peruvian highlands (Engel 1988b: 81–86), the Ayacucho region (MacNeish et al. 1983), and the Pachamachay cave in the Junín area (Rick 1980) indicate. In all of these highland sites or areas the remains of circular dwellings were detected, but they were not associated with burials. However, in the caves of Quiqche and Tres Ventanas, burials were detected but were located outside the structures that were interpreted as dwelling remains. The custom to bury the dead preferably within abandoned dwellings therefore connects Pernil Alto with traditions of the Central Peruvian coast, and not with the highlands.

The pits of the dwellings—whether containing later intrusive burials or not—were never built over or disturbed by other dwellings of the Middle Archaic occupation at Pernil Alto. This indicates that it was known by the population that the abandoned dwellings contained burials and were therefore not touched. A similar interpretation is given by Robert Benfer (1999) for the lack of superposition of the dwelling remains in La Paloma. It is nevertheless surprising that even the dwellings that did

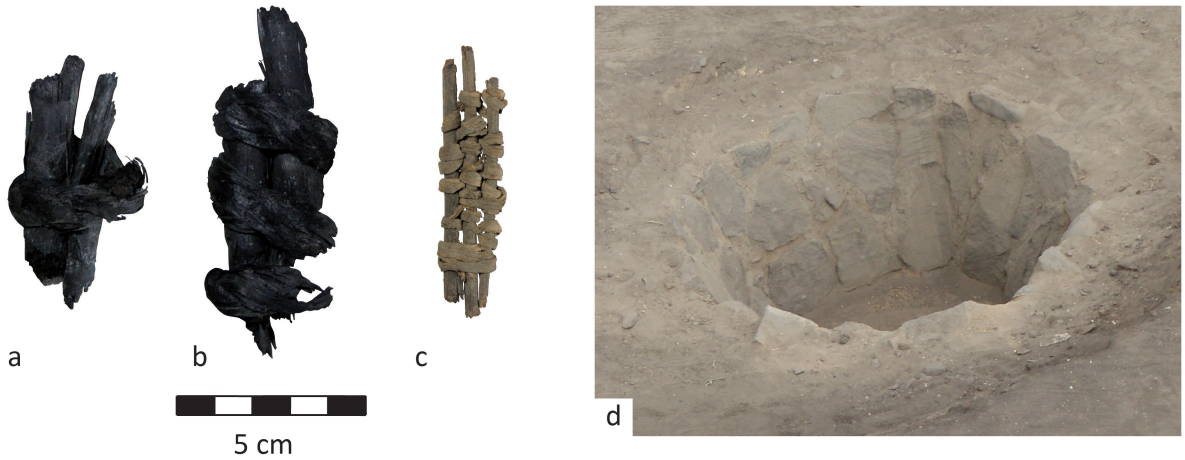

Figure 113: Construction details of dwellings. a–b: Bound-up canes (Gynerium sagittatum) from structure 19. c: Bound-up wood from layer 4429. d: A pit with plastered walls from Aspero. The pit opening has a diameter of about 1.5 m.

not contain later burials (structures 1, 3, 8, 14, and 17) were also not disturbed by later dwelling construction. This leads to the interpretations that: (1) it was known by the population where abandoned dwellings were located. (2) It was known that the abandoned dwellings would likely contain burials that should not be touched. (3) It was not known which dwelling contained burials and which did not. (4) A series of different generations "forgot" over time which dwelling remain contained burials and which not, and therefore the decision was made not to build over or disturb abandoned dwellings in general. The area on the spur is rather limited, and there were more favorable locations for dwellings than the ones chosen. Nevertheless, the dwellings are not superimposed on one another. If, on the other hand, the abandoned dwellings formed areas where rituals were executed is not clear. The "after use" features detected in the uppermost part of structure 16 indicate rather profane activities. Therefore, the burial areas were known and not touched, but cannot be interpreted as having had the functions of cemeteries which are spatially separated from the world of the living and are only visited to get in contact with the dead.

The location of the dwellings was probably not known by group-memory, but was clearly indicated by the depressions that were left from the pits. These depressions were still visible on the surface when the Initial Period settlement at Pernil Alto started, as in their uppermost parts ceramic fragments were found. The depressions left by dwellings were also visible at the site of La Paloma, where they were also not superimposed (Benfer 1999).

The construction of the dwellings at Pernil Alto appears to have been relatively simple. The pits were usually cut into the natural surface of the spur. The pit shapes were therefore cylindrical with steep pit walls and plane bottoms. The only exception is structure 17 which does not show a real pit. The information about the construction of the rising wall and the roof is very sparse. The best information was obtained from structures 19 and 10. The burned zone above the pit floor in structure 19 probably represents the remains of a burned roof/wall construction. It was composed of six or seven wooden posts, probably of huarango wood (*Prosopis pallida*). The posts were burned together with the other roof remains and were between 60 and 200 cm long and about 15 cm thick. Even though they were irregularly distributed, they represent the sustaining posts of a roof/wall construction of a dwelling. The posts of most of the dwellings were not preserved, or were removed when a dwelling fell out of use. The location of such sustaining posts is not indicated within most dwelling remains. In structure 10 and 11 some post marks that were just a few cm deep, could indicate former post positions within the centers of the dwelling where the post sustained a roof. The best information about the post location comes from structure 17, even though it was not characterized by a pit. In structure 17 the postholes and posts were located on the edge of the dwelling floor, forming a ring. Within the center of the floor, in the comparable locations as in structures 10 and 11, some further postholes were detected. Similar features were observed in the Archaic sites of Chilca (Donnan 1964; Engel 1987b, 1988a), La Paloma (Benfer 1999; Engel 1980) and Paracas 514 (Engel 1987a, 2010: 316). In all of these sites the dwellings were circular to oval, semi-subterranean, and defined by a ring of posts or postholes. Due to extraordinarily good preservation, it was possible to reconstruct the construction of dwelling 12 in Chilca (Donnan 1964). In this reconstruction the posts were fixed in the edge of the dwelling floor and their tops were then bound together above the dwelling center, giv-

ing the dwelling a conical shape. Fréderic Engel (1988a: 16) later doubted this conical reconstruction and suggested a flat rooftop, conceding that an exact roof reconstruction would be difficult. Nevertheless, the dwellings of Chilca, La Paloma, and Paracas 514 can be reconstructed as small huts with inclined walls or roofs that were sustained by supporting posts fixed along the edges. The same reconstruction is applicable to structure 17 at Pernil Alto. A difference between the dwelling remains of Chilca, La Paloma, Paracas 514 and those of Pernil Alto are the depth of the pits of the dwellings. The former had depth between 25 cm at La Paloma (Engel 1980: 107), 35 cm at Chilca (Donnan 1964: 139) and 50 cm at Paracas 514 (Engel 1987a: 55). The pits of the dwellings at Pernil Alto were distinctly deeper with depths between 60 and 80 cm. Therefore, a probable explanation for the lack of the surrounding postholes in most of the dwellings is that the sustaining posts in most of the structures were leaned against the deeper pit walls. This position secured them and made fixing holes for the posts needless. The deeper pit walls at Pernil Alto would have provided enough stability. The posts would therefore just produce shallow marks on the hard ground, which are difficult to detect and were thus only detected in structures 10 and 11 in the center. The roof was probably sustained with additional sustaining posts in the centers of some dwellings. In situations where the dwelling pits were not as deep as they generally were at Pernil Alto, such as at Chilca, La Paloma, Paracas 514 and even in the case of structure 17, the outer posts had to be secured within small postholes to avoid shifting. This explains the detected post holes of structure 17, for which a special location on the spur was used. To cut a pit was needless there, but the posts had to be secured in holes. On the edges of the large pit of structure 12 some post marks were detected which indicated a more stable construction. Following Christopher B. Donnan's (1964) reconstruction of dwelling 12 at Chilca, the post beams were fixed with a surrounding horizontal beam at about 20 cm. The resulting frame, with the posts fixed above the center, would have resulted in a very stable construction, comparable to a tent. This frame could have been fixed either within postholes or—as assumed here for Pernil Alto—within deeper dwelling pits. The connection between the surrounding beam and the tallying posts was done with cords at Chilca, and the cord remains found within the structures or dwellings at Pernil Alto probably had the same function. The posts at Chilca were made of wood but as well of canes (*Gynerium sagittatum*) that were bound together. The same material can be supposed for Pernil Alto as cane remains were recovered in the structures 10 and 19 and wooden posts from the latter structure as well. In structure 19 two bound up burned cane remains (artifacts 539 and 540) were found which show that canes were bound together to produce beams for the dwelling frame in Pernil Alto as well (Figure 113a–b). Furthermore a fragment of bound-up wood was recovered from layer 4429 in excavation unit 6 (artifact 1280, Figure 113c), which could represent remains of dwelling beams as well. Nevertheless, the preservation at Pernil Alto was not as good as in Chilca, so the details of the frame construction are not known.

The frame cover at Chilca was preserved and consisted of grass and mats. The mat remains in the dwellings of Pernil Alto could represent remains of such covering mats, but could have also served other functions, like floor cover, sleeping etc. Besides such mats, the dense pollen remains of *Typha* sp. from the intra-site pollen analyses (see Chapter 10.5) and the remains of *Gynerium sagittatum* (in structure 10) indicate some simple grass roofing of the structures. A frame cover made of plant material is therefore very probable in Pernil Alto, as plant and mat remains were found but no hides were indicated. The Chilca dwelling had a small and low entrance, and no other openings.

In contrast to Chilca and other Archaic settlements, it was not possible to determine the entrances of the dwellings at Pernil Alto. They were probably accessed from the lowest part of the pit wall, which is produced by the inclined surface of the spur. In the case of structure 17, the entrance was probably located towards the aligned posts in front of the closed ring of postholes. Similar outer, incomplete rings of postholes in front of dwellings were observed in La Paloma, and interpreted there as small courtyards of the dwellings and not part of the sustaining construction (Benfer 1999: 227). This interpretation is followed for the outer ring of postholes at structure 17 and it is assumed that—due to the location of the outer half-ring of postholes and the inclination of the spur in this area—the dwelling was accessed from the southern side. A special feature of structure 8 was the stone plaster on the eastern wall of the pit. This plaster strengthened the pit wall towards the inclination. Some stones on the outer edge of the pit and floor, respectively, were observed in the south of structure 17 and 14. As they were located towards the inclination of the spur, they probably strengthened the constructions in these parts as well. The custom to use stones or even stone plaster within dwellings or dwelling pits is not known from the Middle Archaic of the Peruvian coast. There are, however, examples of stone-lined residential structures from Pajián in Northern Peru (Dillehay et al. 2003). The closest example for real plaster comes from the Late Archaic site of Aspero on the Central Peruvian coast (Willey/Corbett 1954; Moseley 1973). However in Aspero, the walls of some large pits were plastered with stones and interpreted as silos (Figure 113d). Another

example of plastered pit walls comes from the site of Caleta Huelén 42 in Northern Chile, which dates to the fifth millennium BP (Zlatar 1983). There, the walls of semi-subterranean dwellings were plastered with large, vertical stones, but—as in Aspero and in contrast to structure 9 at Pernil Alto—the stone plaster was applied to the entire pit wall and was found in all dwelling remains. Therefore, the stone plaster of structure 9 and the stones in structures 14 and 17 at Pernil Alto seem to not be connected with other architectural traditions, and were likely just practical solutions to strengthen the pit walls in individual cases.

The similarities of the dwellings of Pernil Alto to the dwellings of the highland area are not as pronounced. The best known examples are from the seasonal camp site of Asana (Aldenderfer 1988) in the Southern Peruvian highlands, dating to the seventh millennium BP. The dwellings there were characterized by circular to oval structures of sizes between 3.4 and 6.2 m² that were not cut into the ground, were surrounded by post molds, and showed prepared clay floors (Aldenderfer 1988). Thus they appear to have been more tent-like and dwelling pits are lacking, but their small floor size is similar to the floor sizes of the dwellings of Pernil Alto. The dwellings from Quiqche and Tres Ventanas in the Central Peruvian highlands (Engel 1988b: 81–86) were located within caves. They reflect the construction of the dwellings of La Paloma (Engel 1982). Due to their location they were probably internal cave shelters rather than real dwellings. However, the construction of the dwellings at Pernil Alto is more linked to the coastal area of Peru. Nevertheless, the dwellings in La Paloma and Paracas 514 had larger use floors of 10 to 12 m² (Benfer 1999: 224) and 15.8 m², respectively (Engel 1987a: 55; no floor size is given, but a diameter of 4.5 m). One very large structure with a diameter of 9 m was observed in Paracas 514 (Engel 1987a: 55). Paracas 514 was dated to about 6000 BP (Engel 1987a: 55) and the described dwelling of La Paloma was associated to layer 400 there, which was dated to 7800–5300 BP (Benfer 1999: 224). Therefore, both sites were older than Pernil Alto (compare Chapter 6) and the dwelling remains are most comparable to structure 17 of Pernil Alto. Chilca, on the other hand, was dated to about 5700 to 5000 BP (Engel 1988a: 14) and was thus more or less contemporaneous with Pernil Alto. The floor size of the dwelling there was 4.9 m² (Donnan 1964: 139; no floor size is given, but a diameter of 2.5 m of the circular hut) which is nearly the same size as the dwellings of Pernil Alto. The economy of Chilca was mainly based on marine resources but included more domesticates than earlier sites (compare Chapter 3). It is possible that there was a trend of reducing dwelling sizes towards the end of the Middle Archaic Period, when plant production became more important and villages emerged, but further research and more information about dwelling construction and size is necessary. Furthermore, the dwellings appear to become more stable, as the deeper pits of Pernil Alto indicate. Structure 17 at Pernil Alto would then reflect a return to an older tradition with larger floor sizes. However, the dwellings of Pernil Alto show, in general, a high variation in construction details, including a possible apsis of structure 7, a central post in structure 11, an oval to figure-8-like ground plan of structure 10, and stone slabs on the pit wall in structure 9. This indicates that even though the general construction of the dwellings was relatively uniform in terms of basic characteristics—like semi-subterranean, size, general shape, possible covering—and followed a certain idea of a dwelling, the dwellings were not standardized, but constructed based on specific needs.

Various activities were conducted in the context of the structures at Pernil Alto as indicated by findings and features.[24] These included:

1. plant processing—indicated by plant processing tools like ground stones, handstones, pestles, and stone bowls;
2. burial deposition—indicated by intrusive burials;
3. tool use—indicated by lithic tools like cutting tools and wooden tools like digging sticks;
4. lithic production—indicated by obsidian debris, andesite debris, cores and production tools like percussors and retouch tools;
5. storage—indicated by storage pits, bottle gourd remains and basketry remains;
6. animal consumption—indicated by the remains of big mammals, rodents, birds, and other animals;
7. fire—indicated by fire marks and fireplaces;
8. aquatic food consumption—indicated by sea shells and remains of freshwater shrimp and sea urchins;
9. plant consumption—indicated by the remains of edible domesticated and wild plants;
10. textile production—indicated by textile tools and plant fiber bundles;

24 The categories of activities listed here are not the same categories of activities analyzed in Chapter 15. This is because all activities analyzed here and in Chapter 15 were derived from the archaeological record and not defined before. The activities here were derived from the dwellings and associated artifacts and features, but the activities in Chapter 15 were derived exclusively from all artifacts recovered on the site (including those from occupation layers, burials, and other contexts). Therefore, the categories of activities differ, even though there are some clear overlaps. The activities analyzed here serve only to characterize the use of the dwellings.

11. rituals—indicated by the figurine and raddle remains, and
12. animal deposition—indicated by animal remains in pits in anatomical order.

Table 56 depicts an unconstrained seriation of the evident activities for each structure. Within structures 17, 3, and 14 no activities were evident. All other structures were connected with various activities, but none was connected with all possible activities. If the structures were left after their use as dwellings, they probably were cleaned and all valuable items were removed. Therefore, only useless or lost remains can be found—with the exception of structure 19. In structure 19 the entire structure was changed from a dwelling to a burial. Thus the range of the activities associated with the dwellings can be conceived in general, but a functional difference between the dwellings is not given. The seriation of the conducted activities is also not assignable and does not produce clear functional groups.

Nevertheless, some activities have left more remains than others. Figure 114 depicts the frequencies of the evident activities in the structures (based on the row named "total" in Table 56). The burial deposition indicated by the intrusive burials was not an activity that can be assigned with the dwelling use of the structures, but was an activity that took place after the structures were abandoned. The remaining activity indicators make clear that the evident activities were mainly those of food consumption, plant processing and tool use. Furthermore, fires were burned within the dwellings—based on their remaining sizes probably for heating or light proposes—and food was stored. Rituals and the deposition of animals as well as textile production were rather exceptional. Textile production can probably be explained by the lack of light in the closed dwellings that would have been necessary for fine textile production. Rituals and animal depositions were exceptional activities in general and were most probably not everyday activities. Indicators for rituals are difficult to detect and leave only sparse information in settlements. Keeping in mind the limited space within the dwellings and reconstruction which suggests they were covered, even those activities that left more information were most probably only conducted within the dwellings under certain circumstances, like during windy or cold weather. The small size of the dwellings contradicts the interpretation that those activities were limited to, or preferably con-

Structure	Activity											
	ritual	textile production	plant consumption	tool use	lithic production	plant processing	storage	animal deposition	aquatic food consumption	animal consumption	intrusive burials	fire
19	x	x	x		x	x	x					
13		x	x	x			x					
8				x	x	x						
6				x	x	x					x	
11	x			x	x	x			x	x	x	
12		x	x	x	x	x	x		x	x	x	x
7			x	x	x	x	x	x	x	x		x
9				x	x	x	x			x	x	
16		x	x	x		x	x	x	x	x	x	x
18				x	x	x			x	x	x	x
1					x	x					x	x
10						x	x		x	x		x
5							x			x	x	
2											x	
4											x	x
17												
3												
14												
total	2	4	5	9	9	11	8	2	6	8	10	7

Table 56: Unconstrained seriation of the activities in the context of the structures at Pernil Alto.

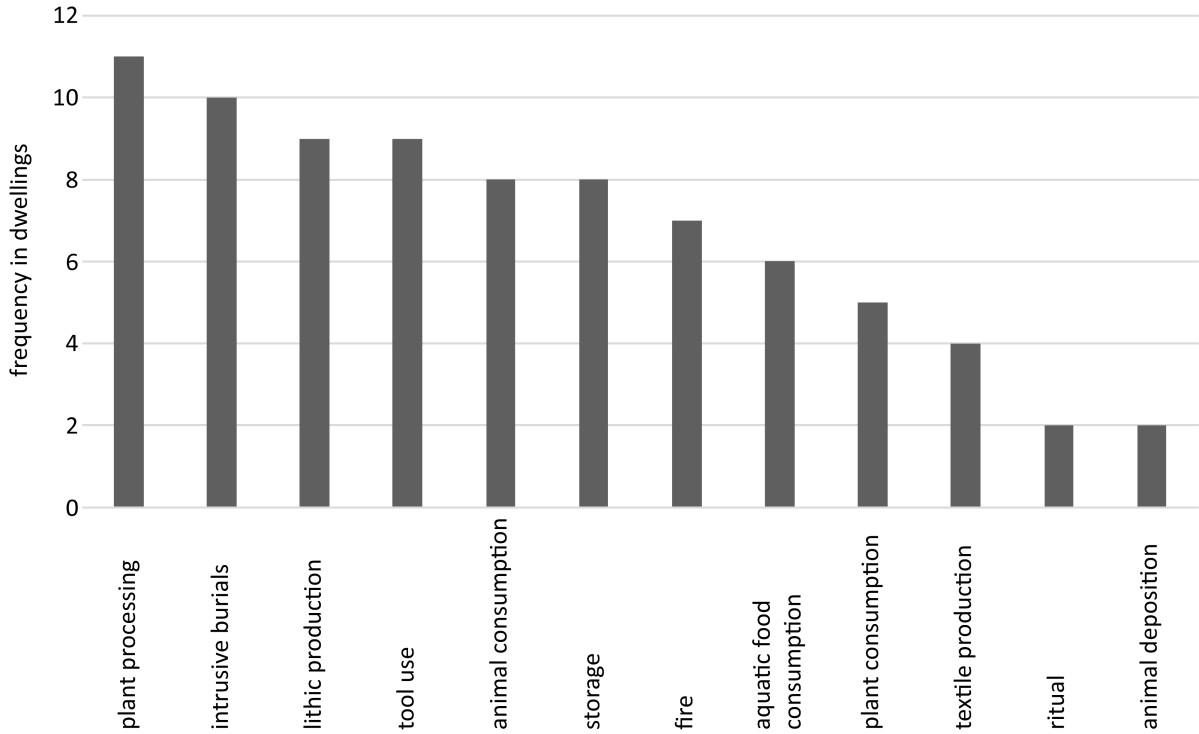

Figure 114: Frequencies of evident activities in the structures at Pernil Alto.

ducted, inside. Furthermore, the open areas between the dwellings held numerous activity features—like pits and fireplaces—and the occupational layers outside the dwellings contained the majority of plant remains and artifacts. An exception here is the storage that was most probably done within the dwellings for safety reasons, such as protecting food from animals. Thus, the dwellings at Pernil Alto cannot be interpreted as houses, in which everyday activities took place regularly, but as dwellings that were mainly used for sleeping and sometimes for other activities when the weather or light outside was too poor. In some ways the dwellings were used like modern camping tents, and nearly all everyday activities were conducted in the open air. Due to their size the dwellings would have offered sleeping space for 2–4 persons. This is reflected by the average number of individuals (n = 23) of the intrusive burials (n = 22) within structures (n = 10; without structure 19), which is 2.3.

A correspondence analysis to detect functional differences between the dwellings fails. The presence and abundance of classes of findings within the dwellings were included. Structure 19 was excluded, as it had been burned down, and was probably not cleaned beforehand and therefore would influence the results. Furthermore, structures 6, 12, and 13 were excluded, as the documented parts of those were too restricted. The intrusive burials have been excluded as well. The minimum sums for objects and variables was set to 2. The analysis was done using the CAPCA Ver. 2.11 software. The results are shown in Figure 115. The percentage of the inertia is 65.32 % (29.94 % on the 1st principal axis, 22 % on the 2nd principal axis and 16.38 % on the 3rd principal axis), but no clear structure is identifiable. Therefore, a functional difference between the dwellings was not given. Social differences between the dwellings cannot include the numbers or weights of findings, as the abandoned dwellings were probably cleaned and valuable items removed. Nevertheless, access to different resources could reflect differing social status of the inhabitants of the dwellings. For example, this could have been the case with individuals or groups which had distinctly better access to obsidian or marine resources. However, the result of the correspondence analysis indicates no clear differentiation. The structures all "cluster" around a center and the distribution of the variables do not indicate any structure. Therefore, based on information from the dwellings, the community of Pernil Alto was not structured in a social or professional way. The society appears to have been egalitarian, in which all individuals had the same access to resources and activities were not conducted by certain specialists. Nevertheless, a differentiation by age, sex, experience, and individual talent can be assumed, but is not reflected in differences of the dwellings.

This interpretation is supported by the results of Michael Malpass and Karen E. Stothert (1992), who

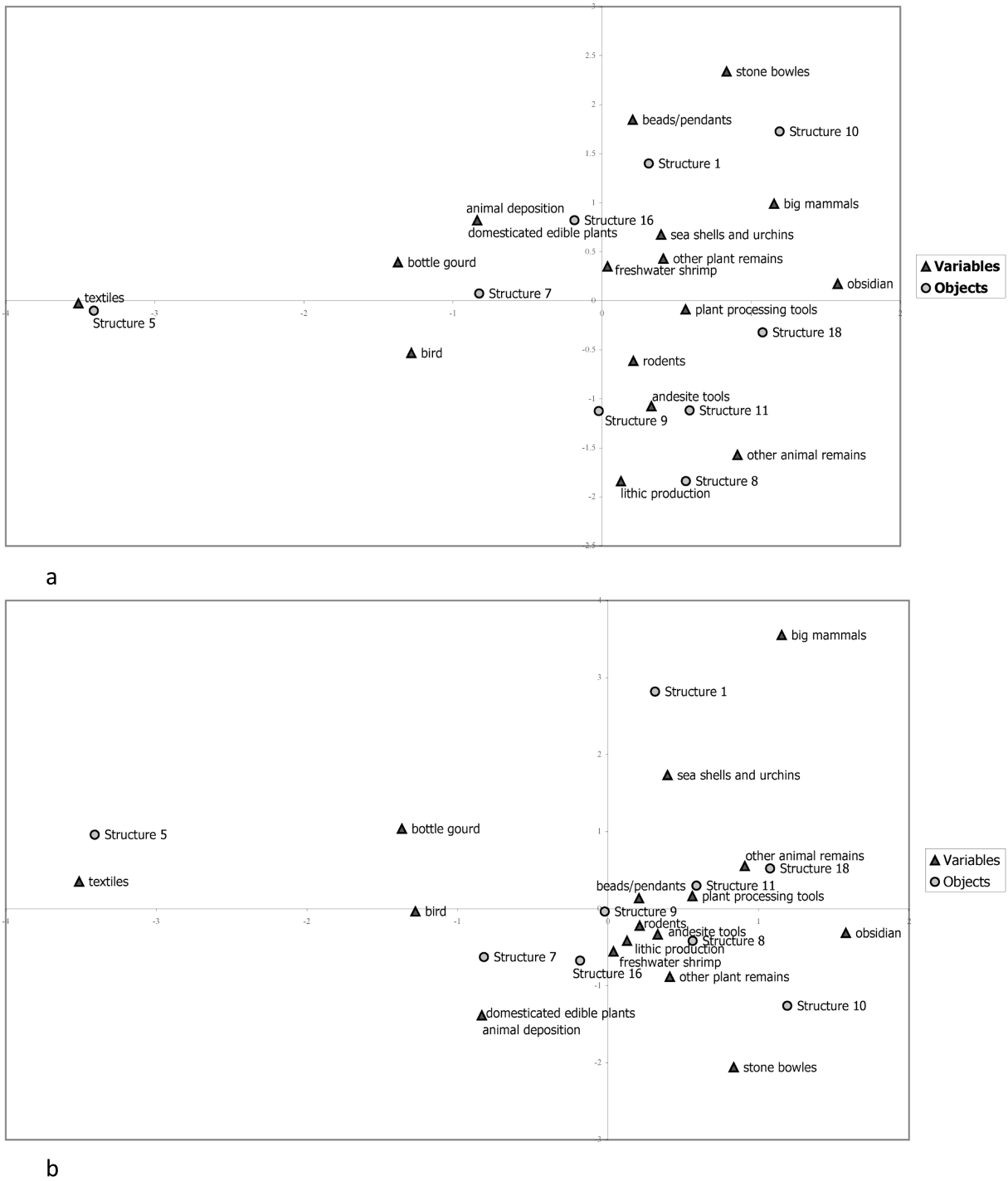

Figure 115: Results of the correspondence analysis of the dwellings (a: principal axis 1 and 2, b: principal axis 1 and 3.).

studied the development of preceramic houses and households in Western South America. They found "support for the interpretation that small, round domestic structures are evidence of social groups that are relatively egalitarian and whose economic activities are organized communally, that is, with emphasis on cooperation and sharing" (Malpass/Stothert 1992: 138). On the other hand, Malpass and Stothert found that "most activities, in particular food preparation, were conducted outside the dwelling, in areas probably shared with others. This suggests that generalized reciprocity was practiced by these preceramic individuals and families" (1992: 147). These results and interpretation of Malpass and Stothert can be applied in part to the

results of Pernil Alto, where most activities were likely conducted outside the dwellings as well. However, in the majority of the dwellings (73.33 %) at Pernil Alto in which any indicators were found (11 of 15, compare Table 56), plant processing is indicated. Therefore, plant processing was associated with the individual dwellings and thus may not have been a communal activity. This could indicate that there was a trend towards a higher structuring at Pernil Alto that is at the end of the Middle Archaic Period. Nevertheless, it is the only indicator for a diversification of the dwellings of any kind, and therefore only a hint. In general, all results from the dwelling remains indicate a "relatively" egalitarian society.

Lewis R. Binford (1990) has investigated the relationship between house or dwelling construction and mobility within ethnographically studied hunter-gatherer groups. His study was highly detailed and incorporated 198 cases. He distinguished between "fully mobile or nomadic" situations with a high "residential mobility throughout the year", "semi-nomadic" situations where "relatively localized 'winter' house sites are lived in continuously during the coldest periods of the year", "semi-sedentary" situations in which "relatively permanent house sites are maintained and returned to frequently, but where groups make seasonal forays from these hubs, moving their residential camps from place to place", and "fully sedentary" situations with "groups who maintain living sites that are regularly used and to groups who do not move their residences from year to year, although task units may travel out periodically" (Binford 1990: 122). These categories, while established for hunter-gatherer groups, appear to be the most appropriate definitions to define the mobility patterns for the emergence of permanent settlements in the Middle Archaic or Late Archaic Periods of Peru as well. When the results of Binford are compared with the results of dwelling analyses at Pernil Alto, then some interesting insights into the mobility patterns might be derived from the dwellings: Structures with circular or semicircular ground plans seem to be typical for fully mobile and semi-nomadic groups, but appear as well in 38.7 % of the semi-sedentary and 14.3 % of the fully sedentary groups (Binford 1990: 123, Table 1). Thus, the ground plan of the structures at Pernil Alto was most probably associated with a mobile or semi-nomadic group. Another characteristic analyzed by Binford was the degree of immersion of the dwellings into the ground. In his results, 93.6 % of the fully nomadic groups and 70.9 % of the semi-nomadic groups built their dwellings directly on the ground surface, whereas 51.6 % of the semi-sedentary and 52.4 % of the fully sedentary groups build semi-subterranean structures, like at Pernil Alto. The roofing cover at Pernil Alto most probably consisted of grass (*Typha* sp., see Chapter 10.5) and mats, as indicated by the findings. These roofing materials are used by 41.9 % of the fully mobile groups, 50.6 % of the semi-nomadic groups, 19.4 % of the semi-sedentary groups and 23.8 % of the fully sedentary groups studied by Binford (1990: 126, compare Table 4 there). The presence and absence of alternative housing was also analyzed by Binford. At Pernil Alto no distinct alternative housing form can be assumed as structure 17 is most probably the result of an adjustment to the natural surface shape. The absence of alternative housing was found in 70 % of the fully mobile groups, 34.1 % of the semi-nomadic groups, 43.3 % of the semi-sedentary groups, and 76.2 % of the fully sedentary groups, studied by Binford (1990: 127, compare Table 5 there). Binford also included whether the material in roofing and wall material differed, but as no information about that is known from Pernil Alto, they cannot be included. Following the tent-like reconstruction of Donnan (1964), roof and sides were probably built in one frame. Thus the dwellings would have had a conical roof with no distinct walls, a situation that is assumed also for Pernil Alto.

When the percentages for the dwelling characteristics for the different mobility groups that fit with the results of Pernil Alto (which are circular and elliptical, semi-subterranean dwellings, covered with grass and/or mats, and with no alternative housing) are summed (Table 57), an index percentage of accordance between the groups studied by Binford and the record from Pernil Alto can be calculated. Within this calculation, the record of Pernil Alto would coincide with 24.5 % to fully nomadic groups, 23.8 % to semi-nomadic groups, 22.5 % to semi-sedentary groups, and with 29.2 % to fully sedentary groups. The differences between these accordances are so minimal, that no assertion of the mobility of the population can be made using the information from the dwelling forms. All four stages of mobility—as defined by Binford—would be equally reflected by the dwellings at Pernil Alto. Therefore, the information about the mobility at Pernil Alto based on the information from the dwellings is indeterminate.

mobility	dwelling character					sum	Index-%
	ground form	subsurface form	roofing cover		alternative housing		
	Circular and elliptical	semi-subterranean	grass	mats	absent		
fully nomadic	12.9	3.2	41.9	0.0	70.0	128	24.5
semi-nomadic	10.7	29.1	36.6	14.0	34.1	124.5	23.8
semi-sedentary	3.2	51.6	12.9	6.5	43.3	117.5	22.5
fully sedentary	0	52.4	19.0	4.8	76.2	152.4	29.2
sum:	26.8	136.3	110.4	25.3	223.6	522.4	100.0

Table 57: The dwelling characteristics of the groups of different mobility stages from Binford (1990) that reflect the characteristics of the dwellings of Pernil Alto. All indications are percentages (The original data was taken from tables 1, 2, 4, and 5 from Binford 1990: 123f. 126f.). The sum in the second to last row sums up the percentages of the different characteristics per mobility stage. The index in the last row gives the percentage of that sum as distributed over the different mobility stages.

The oval or circular dwelling structures of Pernil Alto fit to the general development of dwellings or houses on the Central Peruvian coast. Engel (2010: 317) distinguished three preceramic house-types in his posthumously published studies. The first two refer to Middle Archaic dwellings. The first category is characterized by houses on the surface with recessed floors and surrounding pits, which reflects the construction of structure 17. Houses of this type are usually found close to lomas and in unstructured settlements. The second category is characterized by semi-subterranean large pits, without indications of the roof constructions, that are interpreted by Engel (2010: 317) as dwelling remains, because otherwise dwellings would be missing at settlements. Houses of this type were usually grouped. Therefore the majority of the dwellings of Pernil Alto correspond to this second category and seem to have been typical on the Central Peruvian coast. The first stone implements in structures on the Peruvian coast appear about 4500 BP and are characterized by small circles of large stones, arranged around cavities (Engel 2010: 317). Lanning (1961) mentions stone bases for dwellings in Central Argentina and Northern Chile for the time between 7950 and 4950 BP. Very early evidence—already from the local Las Pircas Phase (9800–7800 BP) for stone implements in structures is known as well from higher zones in Northern Peru from the Nanchoc area (Dillehay et al. 2011b). In Pernil Alto—even if only exceptional—the first stone implements for dwellings on the Peruvian coast are evident by structure 9, and—less pronounced—by structures 14 and 17.

Rectangular houses do not appear before 4500 BP (Engel 2010; Malpass/Stothert 1992: 145f.) in the Late Archaic Period in the coastal area of the Central Andes. In the highlands on the other hand, early rectangular domestic structures appeared in the Late Archaic Phase of Asana (Aldenderfer 1993b: 20 f.), but circular dwellings generally continued (Malpass/Stothert 1992: 147). Another development was observed in the higher zones in the Northern Peruvian Jequetepeque, Zaña and Nanchoc valleys (Dillehay 2011c). There, circular dwellings with diameters of 2 to 2.3 m, already implementing mud daub and dried-mud bricks and stones at the basis were observed in the Las Pircas phase (9800 to 7800 BP) (Rossen 2011a: 100f.). In the later Tierra Blanca phase (7800 to 5000 BP) of the same area a change from circular to oval structures was observable at the beginning of the phase and during its development, rectangular, segmented structures with width of 2–3 m and lengths of 3–6 m were found in the Nanchoc valley (Stackelbeck/Dillehay 2011: 128). In total, the development towards rectangular and stone implementing domestic architecture seems to have begun earlier in the highlands of the Central Andes, as rectangular and stone implementing domestic architecture appear much later in the archaeological record of the coast of Peru by about 4500 BP (Malpass/Stothert 1992: 145f.).

The dwellings of Pernil Alto connect the site to the cultural developments on the coast of the Central Andes, were similar dwelling were in use. The dwellings of Pernil Alto were in general small, simple, circular to oval semi-subterranean dwellings used primarily for sleeping. This indicates on the one hand a rather communal group with everyday activities taking place at the open air and not isolated. However, the interpretation of the dwellings for the reconstruction of the form of mobility of the settlers on the other hand is not helpful as the constructions cannot be interpreted as those of fully mobile, semi-mobile, semi-sedentary or fully sedentary groups.