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SETTLEMENT ARCHAEOLOGY IN THE JAUJA REGION OF PERU: EVIDENCE FROM THE EARLY INTERMEDIATE PERIOD THROUGH THE LATE INTERMEDIATE PERIOD: A REPORT ON THE 1986 FIELD SEASON

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Introduction

The 1986 archaeological field season of the Upper Mantaro Archaeological Research Project (UMARP) set out to investigate the Pre-Inka cultural development of an indigenous Wanka group, the Sausa, who lived in one intermontane valley of the central Peruvian Andes. We collected basic economic, geological, and social data spanning the settled prehistoric record, with a focus on the Early Intermediate Period (200 BC to AD 700) through the Late Intermediate Period (AD 1000 to 1460). Although these results are preliminary, this field work has already brought new information about the socio-economic sequence of the Sausa through their cultural development. The 1986 field season was part of the larger, long-term archaeological project in the region, initiated in 1977 by UMARP (Earle *et al.* 1980; D'Altroy 1981; LeBlanc 1981; Hastorf 1983). This paper will present some of the major new evidence discovered from this field season and the analyses completed thus far. While the data here should be linked to the greater Andean cultural scheme, this presentation will not focus on that aspect of the research, but instead will mainly present our new findings.

The research goal for the 1986 work was to study the activities of the household domestic unit, as the economics of the group intensifies and the sociopolitical structure of the group changes from a village level to a multi-site organization. Using the Sausa group as an example, we hope to begin understanding how and why inequality increases as political leadership develops. We are also studying how the group fits into the general Andean cultural pattern with the broader social changes through time. And finally, as part of the Andean situation, we want to be aware of the climate and environmental changes that could have effected the inhabitants.

Our long-term research project has been focusing its efforts on the northern portion of the Wanka, locally called the Sausa or *Xauxa*. The project has been

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investigating two major questions in the Mantaro region. First, we want to chart and to study the onset of economic and social stratification in an indigenous society. Second, we are studying the effects of the Inka incorporation of the Wanka society into their empire, both politically and economically. Our research builds most directly on the pioneering work of Ramiro Matos Mendieta and Jeffrey Parsons, who conducted survey research in the region in 1975 and 1976 (Matos 1959, 1966, 1972, 1975; Matos and Parsons 1979; Parsons 1976; Parsons and Matos 1978; Parsons and Hastings 1988), but many others also have contributed to our understanding of the area (Browman 1970; Flores 1959; Fung 1959; Lumbreras 1957, 1959; etc.). In 1986, we investigated the first question, long-term change and continuity.

From the data that existed before UMARP began working in the region, some interesting trends seemed to be emerging from the agricultural development and changing settlement patterns. However, the evidence we had was not sufficient to interpret the settlement pattern changes (Browman 1970; Parsons 1976; Parsons and Hastings 1988). To study social evolution and to understand local Sausa development therefore we had to refine and specify both the ceramic sequence and the settlement pattern changes.

Interested in detailing domestic production, consumption, and exchange, we thought that a focus on the production unit would be most effective. Therefore we set out to study the "household" or residential compound, defined as a physical location where small groups of people join together to live and pool resources in production and consumption (Hayden and Cannon 1982; Netting *et al.* 1984; Wilk and Rathje 1982). In previous years, we have excavated individual residential compounds at sites in the Late Intermediate Period and the Late Horizon (Earle et al. 1987). These excavations allowed us to designate a domestic unit as a walled compound area with one or more structures. The 1986 excavations at the long-occupied village site of Pancán uncovered a series of these compound units. We hope that by focusing on individual domestic compounds we will collect specific data on production unit activities, as well as on the supra-household, neighborhood organization between settlements.

As this report will show, an essential part of our project also includes reconstruction of the climatic conditions and vegetation throughout this prehistoric sequence. Such a study is critical to unraveling human impact on the landscape, which is distinct from climate change. Eventually we hope to describe human impacts on the environment as well as the environmental constraints that affected the prehistoric Sausa population since Formative times. Our interest in the environmental data for this long time span should not imply that we believe the environment has caused cultural development. Rather, because the Andean region has such a complex, diverse physical setting, we want to understand its impact and include any appropriate effects in our discussion of cultural developments and changes.

The archaeological survey covered the whole study region except the eastern mountainous zones near Quero (Figure 1). The excavation at Pancán was located about 4 km to the north of Jauja, on the southeastern shore of Laguna Paca. The owners of the site informed us that the site area is called *Ninacanya*, "a place of burning," in Quechua. The site has been unoccupied since Inka times and is now an agricultural field. The geological research was conducted both around Laguna Paca (including the local environment of the site) and at local glaciers in the eastern and western cordillera.

The study region

The study region is within the Junín Province in the district of Jauja, east of Lima, about 250 km from the coast. Small valleys with steep, rocky hills, rise up to craggy snow-covered peaks; these features have been cut by small winding streams. Our study region is located along the northern section of the Upper Mantaro River Valley (*Guanca Guamani*) between the Huaricolca Puna to the north and the southern boundary of the historic Sausa ethnic group, around the modern settlement of Sincos in the central Mantaro Valley to the south. The eastern and western borders are the edge of arable lands as they rise up to the glaciated cordillera on both sides of the valley. This extends to the west above Tajana and to the east up out of the valley near Quero (Figure 1). The region is approximately 20 km by 15 km. Elevation ranges between 3300 to 4200 meters.

Five major land-use zones, which the modern Sausa use differentially, are: the valley lands of the main river; the small, slightly higher tributary valleys to the north and east; the hillsides; the rolling upland plateau; and the lower puna hillsides. Several microzones exist within each of these terrains, but in general these zones equate to the land-use activities of today's farmers (Pulgar Vidal 1967; Mayer 1979; Hastorf 1983). Dry agriculture is dominant in all zones, but irrigation agriculture occurs in the valleys and the hillsides near springs. This region can produce maize up to 3600 m elevation and tubers up to 4000 meters. All indigenous Andean crops are still produced, with the European crops wheat and barley added to many crop rotation sequences.

Today the region is covered by grassy, herbaceous vegetation with shrubs and trees along field boundaries, near streams, and in protected valleys. The most common tree species seen today have been introduced, and one may imagine that tree distribution could have been much different in the past. There is marked evidence of substantial soil erosion throughout the area, which could have occurred over the last two millennia, especially since the local lakes are only 2-5,000 years old (Wright, personal communication 1987). The small herbs and forbs are native to the region and are predominantly types that survive in disturbed environments. A different set of plant taxa lives along the banks of streams, canals, and lakes, never very far from a settlement. This impact suggests long-term manipulation of the environment by the inhabitants.

The region's soil is predominantly alluvium, deposited by a series of glacier outwashes as well as unconsolidated deposits that have been created on the steep slopes of the surrounding mountains. Some places in the uplands show evidence of *in situ* weathering spanning long periods of time; other areas, especially in the valleys, suggest that they have been sedimented recently (over the last 2,000 years). The eastern cordillera is composed of many types of metamorphic and igneous rock; the western cordillera is Cretaceous limestone. Therefore the two sides of the intermontane region are quite different in soil type. There is also evidence of a series of small faults in the region. Many small springs appear at the base of hills surrounding the valleys.

THE 1986 PROJECTS

In the following sections, various members of the project present the results of data analyses under their charge.

Geological studies (H.E. Wright Jr.)

Recent climatic changes in the Peruvian highlands are reflected in the advance and retreat of the small glaciers on all mountain ranges above an elevation of about 4800 meters. A significant glacial fluctuation is recorded by the presence of fresh landforms without a substantial cover of vegetation. These features can be compared to the older stabilized land forms dating from the glaciation of the last ice age more than 10,000 years ago. One major objective of the research in 1986 was to obtain material for radiocarbon dating of these more recent glacial events. Earlier work in the mountains west of Junín suggests that these climatic fluctuations occurred before about AD 850 (Wright 1980, 1984).

The principal area of investigation was the Nevada Huaytapallana east of Jauja. The recent glacial features were mapped with the aid of aerial photographs dated to 1961. When the ice stood at its maximum position, it deposited a terminal moraine as well as outwash sediment beyond the moraine. When the ice retreated from its terminal moraine, the frontal area was deprived of further outwash, and peat developed there. Radiocarbon dates from the base of the peat indicate that at five different localities, glaciers retreated between about AD 600 and 1700. A glacial area in the western Nevada Panchacota, south of La Oroya, was also studied in the same manner. Basal peat there yielded dates of about AD 1300 and 1500.

In addition to studying the high-mountain glaciers, we took several cores of lake sediment and peat from Laguna Paca and its marsh, adjacent to the site of Pancán near Jauja. The lake basin seems to have formed in the Mantaro River lowland when glacial gravels, derived from the western cordillera, deposited a fan at the mouth of the Mantaro River gorge. However, the radiocarbon dates for the base of the lake sediment at two sites are only 2550 and 5300 BP, so the lake may have a different origin, perhaps as a solution depression in the limestone bedrock. The shallower southern third of the lake has been converted to a floating sedge marsh, but the open part of the lake has a general depth of about 14 m. The southeastern margin of the lake has encroached upon the toe of the small alluvial fan on which Pancán is situated.

In 1986 the lower two meters of cultural deposits at Pancán were below the water level, which equals the modern lake level. The natural high-water level was presumably about a meter higher before a canal was constructed several decades ago at the outlet toward the southeastern corner of the basin. There is no indication that the lake ever encroached on the site of Pancán during its occupation, however. This rise in lake level may have resulted from new deposition from fans of alluvial sediment originating from the heavily cultivated plain around Jauja and from the adjacent hills to the west. This event probably dates to recent decades or very recent centuries, rather than to the time of Pancán's occupation.

On the other hand, the basal levels of Pancán consist of alluvial sediment originating from the fan extending from the hills to the east. Artifacts occur in this sediment, so apparently during the early phases of occupation the site was occasionally subject to alluvial flooding from the east.

The archaeological surface collection survey (Timothy Earle)

A surface collection survey of archaeological sites was initiated to refine the prehistoric settlement pattern changes in the Sausa region of the Upper Mantaro. This work involved revisiting habitation sites identified by Jeffrey Parsons during his 1975 and 1976 archaeological survey (Parsons 1976; Parsons and Hastings 1988). We wanted to define the area of habitation at each site so as to estimate population size and to collect sufficient ceramics systematically to determine the date of each settlement and construct a more precise settlement pattern history. Our ultimate goal is to describe the growth of population, the distribution of population with respect to subsistence resources, the regional organization of the Sausa, and the articulation of this society with the Andean polities, especially Pachacamac, Wari, and Inka.

Catherine Scott conducted a surface collection survey of late Late Intermediate Period (Wanka II) and Late Horizon (Wanka III) settlements in the Yanamarca drainage, on which our 1986 survey work is modeled (LeBlanc 1981). We visited habitation sites *not* investigated by Scott. These included Yanamarca sites dating from the Formative Period to the Middle Horizon and all settlements outside of the Yanamarca Valley. Our procedures were both simple and standardized. For the area to be investigated, we prepared a map of all sites identified by Parsons, based on copies of Parsons's original aerial photographs on which sites had been plotted. These indispensable data sources, along with copies of all original field forms, were generously provided by Parsons in 1977 when UMARP first designed and began its project. Working with these original site forms and aerial photographs, we determined which sites had the potential to be habitation sites. Special purpose sites, such as canals, roads, agricultural terraces, and quarries were excluded from consideration.

All potential habitation sites were then visited. Upon arrival at a site, we inspected the total site surface to evaluate soil conditions, ceramic density, presence of preserved structures, terraces, and associated rubble. We also checked for the presence of lithics, including hoes, discoids, and grinding tools. In areas of light-to-moderate ceramic deposition, transects were laid down and ceramic density calculated in 4 m x 4 m squares at 10 m intervals. A transect was laid out for every 1.5 ha of habitation area. The surface collection was made along each transect where ceramic density was highest. The purpose was to estimate cultural activity across the site as precisely as possible and to choose locations of maximum density for the artifact collection.

In most instances, transects were laid down through plowed or recently harvested fields. Most sites are located within regions of intensive cultivation and are usually fully farmed or farmed in a mosaic of fields. Selecting plowed and harvested sections thus permitted easy collection without biasing location within the site. In such farmed areas, surface collections were made by scraping and screening the loose surface soils to a depth of 5-10 centimeters. This is our shovel-scrape collection technique. The area to be collected and sieved was initially laid out as a 3 m x 3 m unit and expanded until a full bag of ceramics was recovered. We thought that a full bag would include at least 100 diagnostic sherds, allowing us to compare and date the sites. All ceramics larger than a fingernail and all lithics were collected out of the 1/4 inch sieves for laboratory analysis.

When sites were not farmed, areas of habitation were sampled by an "excavated surface collection" technique. This collection procedure involves the removal and sieving of the humus root zone (approximately the top 10 cm of the surface soil), which provides a collection equivalent to a shovel scrape in agricultural fields.

The purpose was to be able to estimate the area of habitation for each time period. A site area was thought to be residential if it had at least a light ceramic density for any time period (see Parsons 1976 for definition of terms). The residential area can then be multiplied by an estimate of settlement density (structure/people per ha) determined from excavations and surface mapping of sites with preserved architecture (Earle et al. 1987). This work, which is ongoing, requires a ceramic chronology that has been constructed with collections from the Pancán stratigraphic excavations and from a seriation of surface collections (see ceramic section).

Preliminary results from the survey (Timothy Earle)

In all, 134 sites were visited and surface-collected. With the inclusion of the LeBlanc data collected in 1978 (LeBlanc 1981), a total of 160 sites have been surveyed. Although analysis of ceramics and lithics is continuing, preliminary information can be summarized regarding the sites, their size, their topographic locations, and tentative dates. The settlement sequence has been divided into eight categories based on ceramic types. The earlier phases still must be dated absolutely and analyzed statistically to be sure of the ceramic groupings. The phases are Early Formative Period (Pirwapukio), Late Formative Period (Cochachongos), early Early Intermediate Period (Huacrapukio I), late Early Intermediate Period (Huacrapukio II), Middle Horizon (Huacrapukio II/III/Wanka 0), early Late Intermediate Period (Wanka I), late Late Intermediate Period (Wanka II), Late Horizon (Wanka III), and early Colonial Period (Wanka IV).

The number of sites dating to each of these time periods is seen in Table 1. These figures have been standardized by multiplying the raw site count by a correction factor reflecting the length of each phase. During the Formative (roughly 800-0 BC) settlement was sparse. The 4-5 corrected sites identified for each phase are uniformly small (at most a few hectares with more than a trace ceramic density); no evidence of settlement hierarchy exists.

During the Early Intermediate Period (AD 0-600) the number of settlements climbs rapidly to an adjusted count of 57. The exact counts are difficult to ascertain because two site classes, Huacrapukio undifferentiated, with 26 sites, and San Juan Pata, with 27 sites, cannot yet be phased within the Period. Therefore 26 sites have been added to the uncorrected counts for each Early

Table 1. Habitation site frequencies by ceramic phase.

Phase	Site number	Phase length in years	Correction factor[b]	Corrected site frequency
Pirwapukio	6	400	.63	4
Cochachongos	8	400	.63	5
HP I	69[a]	300	.83	57
HP II	70a	300	.83	58
Wanka I	53	500	.50	26
Wanka II	50	160	1.56	78
Wanka III	69	73	3.42	236

[a] For both Huacrapukio I and II 26 sites have been added to their original site counts of 43 and 44 respectively to take into account 26 Huacrapukio and 27 San Juan Pata sites that have not yet been dated to phase.

[b] Correction factor determined by dividing an ideal 250 year time phase by the estimated time length for each phase.

Intermediate Period phase. The type site San Juan Pata has a unique combination of ceramic types but we are not sure if this assemblage represents a separate time or a different site type. In addition to the increase in site number during the Early Intermediate Period, settlement size increases with a few sites for each phase over 10 hectares. The settlement size distribution suggests a site hierarchy with a normal rank size distribution. At present, Middle Horizon (AD 600-1000) settlements cannot be identified except with the presence of Wari, Wari-related, or Cajamarka ceramics that are very rare in surface collections. During the Middle Horizon, there was a definite change in the ceramic assemblage that we recognize by the division between Huacrapukio and Wanka; at present the MH phase of each must be combined with the appropriate EIP and LIP phases. During the Late Intermediate Period, population appears initially to have dropped quite considerably. For the Wanka 0/I phases (AD 800-1300), only 53 sites have been identified. This calculates to only 26 sites for the corrected phase, although because of the Middle Horizon this calculation is tentative at this time. A weak settlement hierarchy continues; most settlements are small but a proportional increase in larger sites may indicate a clustering of polities. For Wanka II (AD 1300-1460), a short and well-defined phase based on earlier excavations, the number of sites, corrected for time span, is 78, and several of these are massive, densely settled hill fort towns. In the north, a strong settlement hierarchy existed with local polities focused in at least three large communities each having two well defined barrios, central plazas, and elite residences with smaller surrounding communities (see Earle et al. 1987 for details). For the Late Horizon Wanka III (AD

1460-1533), the number of sites increased, but the average size of sites declined. Although settlement sizes continued to be diverse, the size of centers were much smaller than the previous phase as the local population was dominated by the Inka state settlements.

Of particular interest are several shifts in the settlement pattern that may relate to changing patterns of warfare, social integration, and agriculture. One way to view these shifts is to look at the frequency of settlements dated to the recognized phases at different elevations as they reflect agricultural potential (Table 2). Three elevation zones are used here to synthesize agricultural potential: <3500 m, where intensive agriculture including maize farming could be concentrated; 3500-3700 m, where intensive tuber farming could have occurred; and >3700 m, where farming begins to become marginal and subsistence potential stresses herding. This same zonal distinction also is suggested to view relative defensiveness, assuming that steepness of local terrain suggests increased interest in defense: <3500 m, settlements on low relief near the valley floor; 3500-3700 m, settlements on lower slopes and hill tops; and >3700 m, settlements on high ridges that would have been most easily defended. From a quick inspection of Table 2, it is apparent that settlements are distributed throughout all elevations, probably indicating a mixed economy of valley and upland farming as well as herding during this whole time span. Throughout the sequence at various times, settlements seem to have been positioned defensively. One phase stands out as distinctive in this way. During the Wanka II, there was a concentration of settlements on high elevation knolls indicating an increased concern for defense. Settlements in this phase are unusually large and densely built with multiple fortification walls. In contrast, for example during Huacrapukio II, most settlements are at lower elevations in undefended locations.

What were the causes for the movement up or the return to the valleys? The settlement shifts upward seem to be caused by internal inter-settlement and political alliance pressures, given the architectural evidence of defense (LeBlanc 1981; Earle et. al. 1987; Hastorf n.d.). Fortified settlements in Peru have generally been considered as evidence of unstable warring conditions. At the end of the Early Horizon and into the Early Intermediate Period, fortified settlements have been recorded in the highland Huamachuco region (Topic and Topic 1987), the lower Mantaro Valley (Browman 1970), and along the north and central coastal valleys (Daggett 1987; Earle 1972; Topic and Topic 1987; Wilson 1987). Generally it is assumed that this warfare represents intragroup competition (Daggett 1987; Earle 1972), although Wilson (1987) has argued for defense against external invaders. During the Late Intermediate Period, fortified settlements indicative of warfare have been described broadly for the central and southern highlands (Hyslop 1976; LeBlanc 1981; Kranowski 1984; Parsons and Hastings 1988). Historical evidence also supports the notion that the Late Intermediate Period pattern represents intragroup competition between local polities (see for example Rowe 1946; LeBlanc 1981).

Movement back down into the valleys might have been influenced by external political-economic factors. We know that the movements down into the valleys in the Wanka III times were caused by the Inka, and the *reducciones* in 1570 were caused by Toledo's Spanish government (Toledo 1940 [1570]; D'Altroy 1981). Similarly, following conquest by the Moche state in the Santa Valley

Table 2. Counts and percentages (in parentheses) of habitation sites by elevation zone.[a]

Phase	<3500 m	3500-3700 m	>3700 m
Early Intermediate Period			
Huacrapukio I	19 (.50)	15 (.39)	04 (.11)
Huacrapukio II	26 (.67)	10 (.25)	03 (.08)
Late Intermediate Period			
Wanka I	29 (.58)	14 (.28)	07 (.14)
Wanka II	22 (.44)	13 (.27)	14 (.29)
Late Horizon			
Wanka III	38 (.45)	18 (.37)	11 (.19)

[a] Totals may be less than Table 1 because a few sites in the preliminary site file are without data on altitude.

(Wilson 1987) and the Lima culture in the Lurín Valley (Earle 1972), regional peace was apparently established and settlements moved down to undefended locations. Could not some external influence have also caused the movement of settlements down into the Mantaro Valley at the end of the Early Intermediate Period?

Given the proposed trends elsewhere in the central Andes, the shift to the valley settlement pattern might have been generated by central coast or Wari influence, either economically or politically, during the Middle Horizon. However, only two sites from the survey yielded Wari pottery (one Wari sherd was collected on each site). The very sparse artifact distribution, coupled with a lack of Wari architecture in the northern part of the Mantaro Valley, suggests no direct Wari influence. There might, however, be some less direct influence, which caused the local population to begin to move down into the valley lands, as is suggested for other valleys in the central Andes (Isbell 1986).

The dating for this settlement shift, however, is problematic. The major change to lower elevations, as supported by the stratigraphic work at Pancán, happened during Huacrapukio II, a phase which has almost no evidence of the Wari presence in the valley. Despite our lack of direct Wari impact in the northern region, it seems likely that local groups may have established a degree of regional integration and stability at that time (Borges 1988). This might be analogous to the shift to unfortified large settlements in Ayacucho just prior to the formation of the Wari polity (Isbell 1988). Interestingly, the beginnings of a shift to higher, more fortified settlements, a population dispersal, and the discontinuity in ceramic styles with the coming of the new Wanka cultural traits may well correspond to the collapse of Wari. Whatever the nature of Wari influence throughout the highlands, it deserves considerably more focused research.

Excavations at Pancán (Christine Hastorf)

This small farming village site sits on one of two small artificial islands at the southeastern edge of Laguna Paca where it grades into a marsh. The site is approximately 0.6 ha in size. The artifactual surface evidence of Pancán covers 90 by 60 m, including a rectangular Inkaic phase structure at the center. A topographic map of the site with the 1986 excavation unit locations is seen in Figure 2. Besides the artificial oval site area, there is an artificially raised pathway from the true shoreline out onto the site.

Pancán was chosen for our 1986 research because of successful test-excavations there in 1977 and 1979 (Earle et al. 1978; Hastorf 1983). These tests demonstrated excellent organic preservation and evidence of intact structure foundations. From all the excavations, we know that the occupation spanned at least the Early Intermediate Period through the Late Horizon. Absolute dates at Pancán span AD 110 to 1010. Table 3 presents the dates we have at this time for Pancán. As one can see, these dates do not form a clear sequence. While all dates are presented, we do not necessarily believe that all are valid. These dates do confirm that the site was occupied before and during the Middle Horizon. The sparse Late Horizon deposits in the southern half of the site were purposefully avoided for excavation, and so we have no dates associated with the surface Inka ceramics.

We began our investigation with a site resistivity survey to try to locate dense walls below the surface. We took readings from three levels. We saw marked differences in specific locations, which suggested that the site was drier and/or deeper in its northern portion. Unfortunately, this finding did not tell us any more than we had known previously from the test trenches. The main problem with the resistivity data was the proximity of the lake and the overall high soil moisture content, which skewed the values of the readings.

We excavated in the northern part of the site because we knew that the south is shallower and has Inkaic deposits. Affected by the late harvest on the site and our speed of excavation, estimated early in the excavation season, we excavated an area of approximately 7.5 by 5 meters. We left a one-meter baulk between two large excavation blocks, minimizing the extent of excavation but gaining spatial distribution information and baulk-profiles for strata interpretation. The excavation was divided into arbitrary 5 m x 5 m blocks labeled with letters A-F. Each of these blocks in turn was subdivided into four 2.5 m x 2.5 m units designated by numbers 1-4. All horizontal and vertical measurements were taken within these blocks and then recalculated back to a permanent datum 6 meters to the east of the excavation (labeled BM in Figure 2).

In all, we excavated five occupation deposits before the water table was reached at about 2 m below the ground surface. Each level represents a major building or use horizon, usually composed of structures and patio spaces, often

Table 3. Radiocarbon age and calendar dates from Pancán.

UMARP ID	Lab. ID	Uncorrected C14 Age BP	Calibrated range AD[a]
Level 1			
76	Pitt-0239	1575±40	440±40
1-5-5-1	I-12,739	1020±80	1012±80 (960, 1039)
Level 2			
343	QL 4202	1070±40	980±40 (899, 1008)
Level 3			
422	Pitt-0240	1885±70	110±70
463	Pitt-0241	1765±50	250±50
482	Pitt-0242	1495±35	560±35
504[b]	Pitt-0243	1555±45	535±45
504[b]	QL 4203	1280±40	689±40 (672, 777)
Level 4			
622	Pitt-0244	1625±35	415±35
1-1-16-1	I-12,737	1380±210	654±210 (430, 880)
707/708	QL 4204	1420±40	637±40 (604, 655)

[a] Based on curve in Stuiver and Pearson (1986: figure 1). The calibrations with standard deviation ranges in parentheses are from Stuiver and Reimer (1987).

[b] 504 was one carbon sample that was split.

with dividing walls, starting with level 1 at the top and going down. We found primary occupation including house structure foundations in four of the five levels; levels 1, 3, 4, and 5. In all five levels, we discovered adobe construction.

We excavated using the Harris matrix system (Harris 1979). In this system, every provenience is labeled independently, relating each one to each of the surrounding proveniences after all have been excavated and all possible knowledge has been gained. This smallest culturally meaningful unit of excavation was called a *locus*. Loci were defined by soil types, location in the site, and depositional actions such as cuts or construction sequences. Each locus received a unique number so that all artifacts could be coded to that particular location. This classification allows fast and accurate computer manipulation of the data. Individual measurements were made for each locus with many artifacts measured in.

Architecture at Pancán (Christine Hastorf)

As we excavated, we came across structures with patio areas, defined by wall foundations. These structures we called architectural subdivisions (ASDs), a term used in earlier UMARP excavations to designate a part of a compound area or a structure. These structures and open patio spaces can be united to form a single compound or domestic area, called an architectural division (ARCDIV) (Earle et al. 1987).

Level 1

The first architectural division, or domestic compound with patio space, covering almost the full extent of the excavation in level 1, is ARCDIV 1, seen in Figure 3. Because level 1 was at the surface, it was simple to follow structure walls without moving much soil. We therefore could expand our excavations to uncover a more complete patio covering an area of more than 12 m x 9 m. All structures had one or two courses of stone foundations. Some had small dug-out trenches in which the stones were placed, while in others, the foundation stones were placed flat on purposefully leveled surfaces. From our excavations, applying the Harris system, we are able to reconstruct the sequence of building and suggest which structures were contemporaneous.

In the north (blocks E and F), three structure remnants were uncovered. These were slightly offset from each other, as seen in the Figure 4 profile showing how the occupants rebuilt almost directly on top of the earlier structure. There, we first uncovered ASD 1 (Figure 3), an almost complete circular structure with a doorway facing south onto the patio area. The two lower structures, ASD 2 and 3, were quite fragmentary and seemed to have been destroyed by later remodeling except in the lowest places. Several of these structures had reddened-clay hearths and midden dumping. Based on the botanical data, the midden material in the structures looked more like kitchen trash than remains of some special processing activity.

In the southern excavation area, three structures faced onto the same patio space as ASD's 1-3. This group was different from the other ASDs in that the buildings were placed on top of each other. From the northwest-southeast patio wall abutting two of the large circular structures, ASD 7 and 8, we learned that these large structures were built first, with the patio wall joining them later. Subsequently, the little D-shaped structure that sits between the two was added on. It is this little ASD 6 that probably is contemporaneous with the last northern structure (ASD 1).

Hearths were found within most of the structures; the best preserved was in ASD 7. In addition to a well-defined floor construction, ASD 7 had a clear occupation deposit, including a quinoa (*Chenopodium quinoa*) concentration in the northwest corner next to a hearth. A southern profile of this structure's stratigraphy is seen in Figure 5. In the microstratigraphy we could see a series of slumps of the adobe wall matrix that had collapsed off of the stone foundation.

Several fragments of the patio wall were uncovered, although we never exposed the doorways to the patio area itself. The patio area contained evidence of many activities, including hearths, pits, and collapsed structure walls, especially concentrations of burned adobe. The burned adobe was the first evidence of collapsed wall construction we found. At first we thought it might be an ephemeral *jacal* (mud and stick) structure, but, by the end of the excavations, we had found evidence that Sausa structures were built of adobe bricks stacked on top of stone foundations and therefore concluded that the adobe in the patio had slumped off the nearby patio or structure walls.

Outside the patio to the west, we excavated a portion of another patio surface that was paved with artifacts (sherds and lithics). This patio pavement, different from the gravel surface of the ARCDIV 1 patio suggests that the open areas of patios were covered purposefully to form surfaces.

Level 2

The second level contained no evidence of stone wall foundations nor discrete patio compounds. The level was quite deep, ranging from 40-60 centimeters. The deposits were amorphous clay-silts with gravel in troughs and lenses, and were dominated by gritty adobe wall slump. Within these loci, there were scattered midden dumps, pits, and odd features such as the chalky, clay-lined circular basin that held several lumps of colored clay (Figure 6).

Our hypothesis about this level's cultural activities is that the more permanent habitation structures were offset slightly out of the excavation area. This conjecture was substantiated in both the east and the west profiles. In both, the stratigraphy showed evidence of adobe wall foundations with dense midden nearby, a pattern seen in later patios. Another feature that turned up frequently in this level, as it did in the lower levels, was irregularly-shaped cobble surfaces (Figure 7). No clear purpose has been identified for these features, but they are most likely related to moisture drainage or perhaps are paths to provide easier movement in a muddy area.

Because so few culturally identifiable loci were uncovered in this level, it remains the most difficult of the five to interpret. The continued but sporadic evidence of activity suggests that the site inhabitants were living nearby. An alternative hypothesis is that during this time the site was not inhabited, but visited sporadically. Such use might correspond with a settlement shift up onto the ridges during the collapse of Wari. The one absolute date from level 2 is around AD 980 (Table 3).

Level 3

Level 3 contained a patio with two large circular structures (ASDs 12 and 13), one small round structure (ASD 11), and accompanying patio-space, making up ARCDIV 4 (Figure 8). Within this patio-space, curving out from structure (ASD) 13 was a small half-circle, single-row wall. This suggests that the patio was divided up into areas perhaps for different uses. Both large structures displayed good evidence of adobe wall construction, with adobe wall-slump above and below the floors. From what was excavated it seems that both large structures were about 5 m across, a significant difference from the 3.2 m average in level 1. For this reason, we were not able to excavate as much of the patio-space as we did in level 1.

Structure (ASD) 12, in the north, is particularly important. The deposit shows that all three structures in this patio were burned, but structure 12 had a very burned floor with dense charred botanical remains resting on it. The structure probably contained the household's agricultural harvest. Patches of quinoa, talhui (*Lupinus mutabilis*), oca (*Oxalis tuberosa*), potatoes (*Solanum tuberosum*), and maize (*Zea mays*) were densely strewn across the floor, interspersed with pieces of wood (Figure 9). Our current interpretation is that the crops were stored in flammable, organic containers either hanging from the wood-beamed thatch roof or suspended from the wall. The fire seems to have come from the north, where the prevailing winds come from today. When the structure burned, all of the stored goods came crashing onto the floor with the conflagration. The structure does not seem to have been reoccupied, and the adobe walls slumped down over and among the burned rubble, creating much of level 2. The floor of structure (ASD) 12 was laced with pits which were filled with burned rubble. This deposit suggests that some of the pits were empty when the fire struck but were filled with debris from the fire. One pit had been previously filled with large ceramic pieces of the Huacrapukio type (Figure 13). The other two structures (ASDs 11 and 13) seem to have been abandoned before they were burned, for there were few artifacts on their floors. However, the smaller ASD 11 has evidence of mint, a shrub used in agricultural storage, as well as more wood than found in other structures, suggesting that it was a storage structure.

Level 4

Almost directly under ASD 12 and 13 were level 4's ASD 16 and 17, respectively (ARCDIV 6, Figure 10). The amount of offset is seen in Figure 11, the southern profile of the excavation showing ASD 13 and 17. Adobe wall-fall was leveled between these structures. Structures (ASD) 13 and 17 provide evidence of one form of architecture in these lower levels. Both were built upon a circle of small cobbles. Resting on top of these cobbles was a set of large foundation stones. On top of these were large slabs of sun-dried adobe, complete with grass impressions. The adobe bricks were bounded by small cobbles and pure grey clay slapped onto both sides of the wall. Figures 12a and 12b display a portion of ASD 17 with its adobe construction. Although most of the floor features had been destroyed in ASD 17, one hearth remained intact on the floor, as did a series of botanical concentrations discovered in the flotation data.

ASD 16 was more mysterious, as can be seen in the plan in Figure 10. Although we uncovered its outer stone foundation, the southern boundaries were never defined well. Several small ephemeral adobe walls were found within the structure. Either northern ASD 16 is really a large patio wall, creating an enclosure that was then divided into many small and often changing divisions, or these little walls divided up a large structure. Supporting evidence that structure 16 was actually a dwelling comes from the hearth found in its northeastern corner, as in the later structures. The base of this level was extremely soggy and the water table was encountered at the foundation of the walls.

ASD 16 represents the second major construction type seen in the lower levels. There is no evidence of small foundation stones, but instead the walls begin with large stones packed in clay. Many different sizes of stones were used in the wall, all of which had to be carried from outcrops around the lake

(Seltzer, personal communication, 1986). Directly above these stones were adobe brick fragments.

Level 5

Level 5 was excavated in a series of test trenches that probed below the level 4 structures and patio-space. Since most of this level was below the water table, a small 3 hp pump was needed to see the stratigraphy. With the pump going, we could see that below the northern ASD 16 wall was another large stone foundation wall. It confirmed that we had in fact excavated all of the fourth level and were encountering an earlier occupation level. The material excavated from level 5 was extremely dense, with especially large sherds. This finding suggests that the inhabitants covered it over quickly with the ARCDIV 6 patio, sealing the earlier trash. From our deepest test trench, we know that there was another occupation surface 50 cm below the surface of the level 4 patio. The level 5 material is part of this earlier occupation.

Trench 1

One of the 2 m x 2 m test trenches that had been excavated in 1977 was used as a profile to guide our excavations as well as allowed us to see below our 1986 excavations. We placed our excavation blocks around this trench 1 to use its profiles and previous evidence of structures as a guide to the 1986 excavations. Once we encountered the water table, we used the pump to empty the trench and to continue down in a small portion of it. Our purpose was to learn how deep the site occupation went and what the ceramic sequence was like through the earlier occupations. The trench showed that the site has 4 m of cultural deposit, but the lowest meter or so was in naturally deposited soil that had eroded off the eastern hillside (see above in the geology section). Throughout the trench deposits the ceramics suggest a continuous early Early Intermediate Period "Usupukio" sequence, which changes in level 5 to Huacrapukio ceramics. Therefore, based on the ceramics, levels 4, 3, and 2 of the 1986 excavations are all late Early Intermediate Period and Middle Horizon deposits, Huacrapukio II and Wanka 0, and level 1 dates to the Late Intermediate Wanka I Period (see below).

Analyses of Materials

Ceramics (Lisa LeCount)

The purpose of the 1986 ceramic research was to develop a regional chronology for the Upper Mantaro Valley using both Pancán excavation material and surface collections from the survey of the northern valley (Table 4). The ceramic material from the stratified site of Pancán is used to make a ceramic sequence to which survey material can be compared to supplement those periods and regions not represented at Pancán. Although excavated material from Pancán has only been dated as far back as the middle of the Early Intermediate Period (HPII), and many of the survey sites exhibit multi-component assemblages, a provisional seriation of the valley has been established which awaits further testing (Owen et al. 1988). In addition to defining a regional chronology, the ceramic material from the 1986 field season is the basis for two studies of sociopolitical and economic activities in the area (Borges 1988; LeCount 1987).

Table 4. Provisional ceramic chronology for the Upper Mantaro Valley.

TIME	PERIOD	PHASE	DIAGNOSTIC TYPES
1534	Late Horizon	WANKA III	Inka and all Wanka II types
1460 1300	Late Intermediate	WANKA II	Wanka Red Micaceous self slip Base Roja Base Clara
1000	Late Intermediate / Middle Horizon	WANKA I	Base Clara Micaceous Coarse ware Wanka Purple slip Wanka Purple on Orange unslipped Wanka Purple on Light Wanka Light on Red
800 600	Middle Horizon	HUACRAPUKIO II	Huacrapukio Purple on Orange Huacrapukio types Wanka Purple on Orange slip
500	Early Intermediate	HUACRAPUKIO I	Huacrapukio Purple on Orange Huacrapukio types Pink Paste ware
200*	Early Intermediate	———	Pebble Polished Cream slip?
A.D.0*	Formative	LATE FORMATIVE	Cochachongos
900 B.C.*	Formative	EARLY FORMATIVE	Pirwapukio

* Estimated date

The seriation procedure

Ceramic types were defined in the field based on composition, surface treatment, and general stylistic elements. Wares are defined as distinct paste and temper types with style denoted as a distinct combination of stylistic motifs and morphological design. Surface treatment is defined by paint, slip, or paste color and surface finish. Styles, wares, and surface treatment therefore cross-cut to define a type. This was considered the most sensitive classification system.

Seriation of Pancán ceramics yielded certain diagnostic types for the Wanka I phase and the Huacrapukio II phase, although the Middle Horizon includes both of these assemblages. A total of six Wari and Wari-related sherds (three each) were encountered in levels 2 and 3. Further, there appears to be a lack of Wari stylistic influence in the local ceramics.

The Huacrapukio I assemblage was defined by a high frequency of pink paste ware in association with Huacrapukio style ceramics from survey collections. This HP I assemblage is stylistically equivalent and temporally comparable to Browman's late Uchupas (1970: 127-132) and Usupukio (ibid.: 132-139) phase assemblages present in the southern valley. The earliest portion of the Early Intermediate Period in the northern Mantaro basin proved difficult to define. Survey collections suspected to be representative of this phase were from multi-occupation sites and contain limited quantities of diagnostic types that appear to be temporally and locally discreet. This phase will therefore remain poorly defined until more excavations are completed. The late Formative phase assemblage contains one known diagnostic type, that defined by Browman (ibid.: 115) as Cochachongos. Sites from the survey containing Cochachongos style bowls yielded few other ceramic types, none which could definitely be associated to the late Formative assemblage. The earliest known assemblage in the northern Mantaro area contains Pirwapukio ceramics as defined by Browman (ibid.: 105). This discrete assemblage is found on single occupation sites.

Description of diagnostic types

Pirwapukio is the sole component of the early Formative assemblage. The brownware, composed of varying quantities of sedimentary and micaceous inclusions, displays a well pebble-polished surface which can have red or black slips, incising, patterned burnishing, or simple circular negative designs. The forms are mainly simple bowls.

As in the southern Mantaro, the northern Cochachongos style of the Late Formative Period has a distinct surface treatment comprised of chevrons, "alphabets", and linear bands near the external rim of bowls (Figure 13a, b). These highly polished bowls may have either bichrome or polychrome surface treatments with red, black, or orange paint on a light, unslipped background. In the northern Mantaro area, this style is applied to at least two temper and paste types. Poorly pebble-polished cream slipped or plain globular jars with coarse subangular inclusions may be associated with these bowls and may have continued into the Early Intermediate Period.

The Huacrapukio style dominates the assemblages of HP I and II phases and is found in low percentages through the Wanka I phase. During the Huacrapukio phases (EIP, MH), the characteristic heavy, convoluted jar lip and the purple-on-orange motif of pendent lines emanating from either scalloped or linear bands near the rim are associated with at least six wares (Figure 13 d, e). The Huacrapukio style also utilized heavily modeled and tooled appliqués at the collar of jars and naturalistic or zoomorphic modeled figures on the necks of jars. Naturalistic, pregnant camelid and human male plaque figurines are prevalent in both assemblages. The Huacrapukio style is also found in Browman's southern Mantaro Usupukio through Calpish phases (1970: 79-139). This wide-spread and long lasting stylistic tradition may indicate long term regional affiliations between households (Arnold 1985; Balfet 1965; Rice 1981).

Huacrapukio I assemblages contain at least 10% Pink paste ware, a distinct open bowl form that exhibits thin walls, small quantities of very fine temper, pebble-polished exteriors, and purple painted motifs on interior paste (Figure 13c). Two other paste types, orange-and-buff wares, exhibit the same style and physical properties. The stylistic motifs present on Pink paste ware is difficult to describe at this time as the surface erodes easily but may be the most chronologically sensitive element during both Huacrapukio phases. Quantitative stylistic analysis has yet to be performed on these wares, but I can say now that the early designs exhibit naturalistic camelids and banded lattice work found over most bowl interiors. These evolve into discretely banded designs found near the interior rim.

The diagnostic feature of Huacrapukio II assemblages is the presence of the early Wanka types in conjunction with Pink paste bowls and Huacrapukio style ceramics. Early Wanka types exhibit the distinct style indicative of the later Wanka types of Base Clara and Wanka Red but display the same purple paint on orange slip surface treatment as the earlier Huacrapukio style ceramics.

The Wanka I phase sees the reduction in the presence of Huacrapukio style (Figure 13f, g). The number of sherds exhibiting paint also decreases from that found in Huacrapukio assemblages. At Pancán, 52% of the Wanka I assemblage consists of plainwares as compared to 11% in the Huacrapukio II assemblage (Borges 1988: 15). In association with this simplification in style, only three wares exhibit the dominant Wanka style within the Wanka I assemblage.

Wanka I types differ from later Wanka types in two aspects. First, the dominant paint color shifts from purple (Wanka I) to black (Wanka II, III), with the use of numerous slip colors on the Wanka I types to the use of only red and cream slips in the later Wanka types. Second, the predominant diagnostic Wanka I wares contain large quantities of mixed sedimentary inclusions while the later Wanka wares are composed of moderate quantities of limestone temper. This continued reduction in stylistic complexity, slip covers, amount of painted area, and number of wares from the Huacrapukio to the later Wanka assemblage may signal the beginnings of part-time ceramic specialists.

The Wanka II and III assemblages have been studied extensively by previous researchers (Costin 1986; D'Altroy 1981; LeBlanc 1981); therefore, descriptions of the late Wanka assemblages will not be presented here. It does seem clear however, that the Wanka II assemblage either originated or had antecedents in the Wanka I assemblage. The distinguishing characteristic of the Wanka III assemblage is the addition of Inka types over the basic Wanka II assemblage.

Using this ceramic chronology developed for the region, Borges (1988) attempted to define Wari interaction in the valley based on the presence of Wari ceramics, settlement pattern shifts, and imported exotic materials. This was difficult since it was found that Huacrapukio II and Wanka I phase ceramics from the southern Mantaro sites of Calpish and Wariwilka indicated a high degree of correspondence with the northern Mantaro assemblages.

LeCount (1987) utilized ceramics from Pancán and previously excavated Wanka II and III sites to investigate changes in the economic and socio-political organization of the Sausa. The bowl assemblage of the Huacrapukio II phase is dominated by small serving vessels after which the types increased in number and complexity until the Wanka III period, illustrating a continual increase in the scale and frequency of social-public activities sponsored by local elite households for the building of alliances, wealth, and prestige associated with political office. The jar assemblages remain relatively stable from the Huacrapukio II through the Wanka II period, reflecting little change in cooking or storage practices.

Lithics (Glenn Russell)

Approximately 12,000 lithic artifacts were recovered during the 1986 field season from surface survey, excavation screen, and flotation samples. A basic technological and functional analysis was completed on the lithic artifacts in Peru. The stone tool inventory included flaked and ground forms. Contrasts between the later and earlier deposits of Pancán and between the Pancán deposits and the Wanka II/Wanka III deposits deserve mention.

When we consider the frequencies and proportions of chipped and ground tools in levels 1 through 4 at Pancán, some interesting trends are apparent (Table 5). Although there are few examples at Pancán, there is a slight decrease in the importance of bifaces (points) through time, decreasing from 1.0% to 0.1% of the chipped stone. At the same time, the frequency of other subsistence tools increases. Hoes, for example, are completely absent from level 4, but increase steadily until they account for 13.3% of the chipped stone assemblage in level 1. All blade tools and unused blades increase in proportion from level 4 to level 1, an indication of increased use of blades over time. Interestingly, flake cores decrease over time, perhaps a reflection of the increased reliance on blades for cutting tools. Ground stone artifacts also show interesting patterns. The absolute number of perforated discoidals decreases from the lower level 4 to the top of Pancán. Rocker grinders and batanes also decrease in frequency from level 4 to 1.

Overall at Pancán the most notable frequency increase is in the hoes. Although most of the lithic inventory did not change much and the deposits continued to contain a standard range of domestic implements, the lack of hoes in the lower levels suggests that hoe cultivation did not come into regular use until the Wanka I period. In addition to a flake and core technology, prismatic blade tools were manufactured at Pancán, particularly in the Wanka I occupation. These blades were manufactured from prepared blade cores and most likely were used as cutting tools and sickle blades, identified by their high silica polish.

Table 5. Chipped and ground stone artifacts from Pancán in counts and percentages. Percentages are of the total tool type assemblage per level.

Chipped Form	Level 1 #	Level 1 %	Level 2 #	Level 2 %	Level 3 #	Level 3 %	Level 4 #	Level 4 %
Unused Flakes	1973	74.2	1698	83.3	1072	80.2	303	74.8
Shatter	38	1.4	49	2.4	50	3.8	14	3.5
Flake Cores	77	2.9	29	1.4	112	8.2	62	15.3
Flake Knives	56	2.1	21	1.0	12	0.9	4	1.0
Flake Scrapers	30	1.1	12	0.6	10	0.8	4	1.0
Discoid Drill	1	0.1	0	0	0	0	0	0
Bifaces (Points)	3	0.1	5	0.2	7	0.5	4	1.0
Unifaces	15	0.6	7	0.3	23	1.7	8	2.0
Denticulates	1	0.1	3	0.1	1	0.1	0	0
Retouched Drill	17	0.6	10	0.5	2	0.2	1	0.2
Notches	0	0	0	0	2	0.2	0	0
Choppers	9	0.3	3	0.1	1	0.1	2	0.5
Core Unifaces	0	0	0	0	1	0.1	0	0
Axes	5	0.2	2	0.1	0	0	0	0
Unused Blades	36	1.4	13	0.6	5	0.4	3	0.7
Blade Cores	0	0	0	0	1	0.1	0	0
Blade Knives	18	0.7	7	0.3	5	0.4	0	0
Blade Sickles	4	0.2	8	0.3	0	0	0	0
Flake Sickles	5	0.2	3	0.1	2	0.2	0	0
Hoe Fragments	354	13.3	158	7.8	19	1.4	0	0
Hoe Blanks	3	0.1	2	0.1	0	0	0	0
Unknown Tools	1	0.1	2	0.1	0	0	0	0
Total	2660		2036		1325		405	

Grinding and Slab Forms	Level 1 #	Level 1 %	Level 2 #	Level 2 %	Level 3 #	Level 3 %	Level 4 #	Level 4 %
Manos	2	2.9	1	2.5	4	6.6	1	2.8
Rocker Grinders	2	2.9	3	7.5	12	14.0	9	25.0
Batanes	1	1.4	5	12.5	11	12.8	4	11.1
Pestles	18	26.4	6	15.0	8	9.3	1	2.8
Mortars	5	7.4	1	2.5	5	5.8	0	0
Abrader	1	1.5	1	2.5	0	0	0	0
Unknown Frags	15	22.1	14	35.0	17	19.8	3	8.3
Unground Slabs	16	23.5	5	12.5	10	11.6	5	13.9
Slabs with Pits	1	1.4	1	2.5	2	2.3	0	0
Perforated Disc.	7	10.3	3	7.5	17	19.8	13	36.1
Total	68		40		86		36	

There are some strong differences between the lithic inventory from Pancán and the ones from excavations of the Wanka II/III period sites. Perhaps foremost at Pancán is the use of flakes as cutting tools and the near absence of the blade technology which is seen at the later sites. In contrast to the later assemblages, most silica gloss is found on Pancán flake tools rather than on blades. One of the most common tool types recovered from later Wanka II/III deposits is the prismatic blade from the local Pomacancha quarry (Russell 1988). These backed blades often have pronounced silica gloss. This form was probably inserted into a wooden handle and used as a simple sickle. These blades were manufactured at specialized locations and traded to other sites. Although blades were recovered from Pancán, the frequency was significantly lower than at the later sites, especially from Wanka II contexts. There was no evidence of blade manufacture at Pancán.

Ground stone artifacts include grinding equipment and perforated discoids made from grained volcanic cobbles and phyllite slabs. Grinding equipment includes cobble hand stone (*manos*), flat grinding slabs (*batanes*), half moon shaped rocker grinders, mortars, spherical pestles, oblong pestles, abrading stones, and perforated discoidals. The central holes of the discoids have extensive polished wear. They decrease sharply in absolute number in levels 1 and 2, implying either a change in tools for war or a change in agricultural technology. The basic forms of grinding stones do not change from the earlier to the later periods, only their relative frequencies do. Rocker grinders also decrease over time, from 39% to a 3% presence. Pancán has a very high frequency of mortars and pestles, whereas later sites have a predominance of larger grinding slabs and rocker grinders (Russell 1988).

The assemblage of bifacial tools found at Pancán is entirely lacking in the later period sites. Pancán had a variety of triangular, concave-base, and ovoid-point forms. Although the number of projectile points is not large (a few dozen), there is a clear decrease in their presence through time at the site. Almost no projectile points were recovered from the Wanka II/III sites, and those that were found seem to have been curated or salvaged from earlier times.

Although obsidian was a minor component of the lithic assemblage, its frequency at Pancán was higher than at Wanka II/III sites, suggesting that the obsidian trade dwindled over the years. Chemical characterization to date demonstrates that nearly all of the obsidian in our region comes from the Quispisisa obsidian source 100 km south in the Province of Huancavelica.

We recovered a large quantity of hoes from the upper levels of Pancán. Hoes are present also in Wanka III assemblages but not so much at Wanka II sites. Figure 14 presents hoe frequencies from survey and excavations, with units adjusted for soil volume. After the Middle Horizon the increased hoe frequencies seems to correlate with valley oriented settlement patterns. One could conclude from this distribution that this cultivating tool tended to be used at lower elevations, probably to till the clay-rich soils. One might also suggest that hoes are linked to maize cultivation for the hoe frequencies correlate to relative maize frequencies throughout the sequence, although this is still only speculative. Before the Wanka I period and during the Wanka II period when these hoes are not common, sharpened wood digging sticks and perhaps discoidals would have been likely alternative agricultural tools to spades with stone hoes.

There was very little trade of lithic raw materials in any of the time periods studied. Inhabitants tended to draw on the most immediately available raw materials. This habit resulted in our discovery of a wider variety of raw material at sites down in the Mantaro Valley near the river deposits. Obsidian (in low frequencies) appears to be the only raw material traded in from outside the study region.

Metals (Christine Hastorf)

Forty-three metal pieces were uncovered from the excavations; three pieces were found during the archaeological site survey. Bruce Owen completed the initial inventory. Given the lack of cultural context from the survey, this description of metal finds will concentrate on the excavated material (Table 6). The density of the metals increased through time. Two pieces from level 2 are gold, one a circular ring of highland manufacture (Owen, pers. comm., 1986) and the other a needle (Figure 15a). There was one fragment of silver sheeting also from level 2, which could have been manufactured locally. The remaining pieces are copper, and were most probably produced locally. These copper pieces have been classed as needles, *tupus*, rings, sheets, shafts with or without flat circular heads (Figure 15b), disks, and undefinable fragments. Metal was encountered in all contexts: structure floors, patio surfaces, post-occupation wall slump and fill, burials, and middens. Many of the needles and *tupus* were bent or snapped, appearing to have been deliberately broken or converted to simpler pins. Several of the *tupu* heads have been snapped off and the rough ends curled over.

Table 6. Metal counts by level at Pancán.

Level	*Tupu*	Ring	Sheet	Shaft	Disk	Needle	Misc.	Total
1	7	0	0	4	1	1	2	15
2	2	1	3	2	0	3	1	12
3	0	0	2	4	0	1	2	9
4	4	0	0	3	0	0	0	7

In level 4 the seven metal pieces were copper, primarily from burials. In fact, one burial yielded four of the six pieces from that level. These were a combination of shafts and *tupus*. Level 3 had nine pieces. Two shafts and one ornament were located in structures (ASDs) 12 and 13, two were from the patio areas associated with the structures. The remaining five pieces were primarily shafts from wall slump and cultural fill. The level 2 deposits, filled with adobe wall slump and midden dumps, had 12 shafts and needles. This is the level where the three precious metal pieces came from, all from midden deposits. The metal distribution of level 1 was very like that of level 3. Of the 15 copper fragments, a disk and a tupu were found on the floors of structures (ASDs) 1 and 7, respectively. Three pieces were excavated from a paved patio surface to the west of the central patio. Two were found in the patio between these circular structures, and the rest were from the plowzone and fill of later origin.

Although *tupus* (decorative and utilitarian) were found in all levels, they are most frequent in the occupation zones of level 1. More frequent in level 2 are needles (utilitarian). This distribution suggests that the inhabitants of Pancán occasionally threw out or lost metal while working outside of the household area, whereas they deposited or lost metal less frequently in habitation areas.

Botanical remains (Christine Hastorf)

During the excavations at Pancán approximately 1200 soil samples were collected. Two were collected systematically from each excavation locus. Each soil sample (6 kg) was then water floated using a motorized flotation system, first designed by Patty Jo Watson (1976). This system circulates water within an oil drum, allowing the fragile charred botanical material to separate out from the soil matrix with minimal damage. The lighter-than-water charred botanical remains float up to the water surface. Because water enters the oil drum steadily, the overflow pours off from a spout. The floating charred material also pours gently off into small-mesh geological screens (6.35 mm and 0.5 mm mesh size). These then are gently transferred onto fabric using a fine water spray and are then dried, weighed, and bagged for laboratory analysis. This system produces a "light" fraction and also a "heavy" or non-floating subsample. The heavy subsample includes water-logged plants along with soil, rocks, lithics, bone, ceramics, and anything else preserved in the soil. The heavy subsamples were sorted in the field laboratory, also using nested geological sieves, with care to retain small items such as fish scales, metal slag, etc. Some plant remains are also found in the heavy fraction.

This process produces comparable botanical samples from the whole excavation, and equally important, it produces samples that are comparable to previously collected archaeobotanical samples in the Upper Mantaro region. This procedure provides a systematic microsampling strategy for all artifact classes and recovers artifacts larger than 0.5 mm in size.

Of particular note concerning the soil flotation samples is the actual sampling strategy employed at Pancán. Paleoethnobotanists have long discussed sampling strategies. Two general techniques have been used: single location bulk samples, and scattered-dispersed soil collection from an excavated provenience (pinch sample). Because of the debate, we decided to use both strategies on the site. After analysis, the two collection methods can be compared. Within each excavation unit one bulk and one scatter sample were collected. Occasionally when there was evidence of special activities, such as hearths or activity areas on floors, we collected additional bulk soil samples. Since we sieved 100% of the excavated soil, we also encountered botanical remains in the 1/4 inch screens, recovering a different sample of archaeobotanical remains.

The local Andean crops seen in the screen and flotation samples are the full range of Andean products: maize (*Zea mays* L.), *talhui* (*Lupinus mutabilis* Sweet), quinoa (*Chenopodium quinoa* Wild.), along with the Andean tubers potatoes (*Solanum tuberosum* L.), *oca* (*Oxalis tuberosa* Mol.), *olluco* (*Ullucus tuberosus* Loz.) and *mashua* (*Tropaeolum tuberosum* L. and P.). While all of these taxa are present throughout the sequence it is the change in frequencies and densities that will inform us about cultural patterns. Today, the microzone around the site can produce all of these crops, but it is especially suited for maize, not viable in many areas of the highlands. Wood identification is also ongoing and will be compared with the pollen curves generated from the Laguna Paca lake cores. As a general overview, Table 7 presents the percentage presence of the major crop species of 703 samples from the four levels at Pancán, analyzed to date by Heidi Lennstrom at the University of Minnesota Archaeobotanical Laboratory. Percentage presence provides a general overview of the botanical presence at a site. It does so by tallying the number of samples that have a specific taxon, regardless of the plants' frequencies. For example, a fifty percent presence of maize means that fifty percent of the samples analyzed have one specimen or more of maize. In this way, the different plant species can be viewed independently of the other species. At this time in the analysis, one can see that the maize frequency increases through time, while *Chenopodium* and tubers remain fairly stable. Domestic legumes seem to decrease once the Middle Horizon begins.

Table 7. Percentage presence of domestic crops by level at Pancán. n = number of samples analyzed.

Level	*Zea mays*	*Chenopodium*	Dom. legumes	Tubers
Level 1 n=265	94	95	33	7
Level 2 n=131	97	95	32	8
Level 3 n=157	86	93	10	10
Level 4 n=150	51	89	5	6

Faunal remains (Elsie Sandefur)

Evidence for domestic animal use is represented by approximately 38,000 animal bone fragments from the nearly 800 excavated loci at Pancán. Animal bone was recovered from every locus by 1/4 and 1/8 inch screens and from the flotation samples. All of the bone excavated in 1986 has been identified except for the miniature bone fragments recovered from the light fractions of flotation samples.

Camelid bones clearly dominate the faunal assemblage at the site of Pancán (Table 8). Recovered bones of the guinea pig (*Cavia porcellus*) were common, at least a few guinea pig bones were recovered from nearly every excavated locus. Dog was rare but present in the two upper levels. A few teeth of the vicuna (*Vicugna vicugna*) suggest that this smaller camelid was hunted in Wanka I times. Bone and antler fragments indicate that the Andean deer, the taruga (*Hippocamelus antisensis*), and possibly the white-tailed deer (*Odocoileus viginianus*) were also hunted.

Table 8. Pancán fauna, sums for levels 1 through 4.

Level	Bone wt. (g)	#Bones	Volume	KGMeat	Mt/Vol.	MNI
1	18465.7	7873	13.16	1028.7	78.2	58
2	29409.0	16888	22.60	913.4	40.4	62
3	14235.6	10717	25.50	622.1	24.4	55
4	1765.3	970	6.67	294.5	44.2	9
Total	63875.6	36448	67.93	2858.7		184

Level	#Cam.	#Deer	#Dog	#GPig	#Micro	#Nonfood
1	14	1	1	9	6	27
2	11	2	1	21	4	22
3	8	2	0	11	4	30
4	3	1	0	1	1	3
Total	36	6	2	42	15	82

Level	#Msrments	#Burned	#Cut	#Tooled
1	185	3175.7	2511.6	223
2	269	11506.1	1832.7	181
3	22	962.9	400.5	78
4	8	137.2	65.2	43
Total	484	15781.9	4810.0	525

Using Elizabeth Wing's (1972) measurement rules for camelid identification, the measurable bones indicate that llama (*Lama glama*) was the predominant camelid deposited. It is considered to have been used primarily for transportation and ultimately for food. Alpaca (*Lama pacos*) was present, represented most heavily in level 2. It was probably used for wool.

There is a scarcity of bones which one would normally expect to find in a lakeside site. Waterfowl, frogs, and fish are under-represented from both the large and small screens and from the flotation samples (collectively summed as #micro in Table 8). A few bird bones have been recovered, for example, bones from the American coot (*Fulica americana*), the speckled teal (*Anas flavirostris*), and from an unidentified hawk. The Junín frog (*Batrachophrynus macrostomus*) is present in small numbers along with remains from a smaller species of frog. A large number of fish scales but very few fish bones are found in the flotation samples, especially in the lower levels (Lennstrom pers. comm.).

A larger number of bone tools were recovered from the upper levels (Wanka I) than from the lower levels, suggesting more concentrated tool deposits in the later phases. A detailed comparison of bone tools with the lithic assemblage is needed in order to understand fully the change in tool utilization for the occupants, but an increase in the upper levels of many cutting tools is suggested. Burned and cut bone was also concentrated in the upper levels (see Table 8). The increase in bone modifications through this time span reflects a more complex utilization of animals at least in domestic contexts.

"The clearest indication of special treatment, and thus presumed regard, is an animal burial" (Wing 1986: 262). Pancán's animal bone consisted not only of tooled bone, household midden refuse, and other occupation debris, but also of complete and articulated camelids and guinea pig skeletons interred in clearly defined pits. The interments of 39 different animals at Pancán were most often located in patio occupation zones and were concentrated in the lower, earlier levels (Figure 16). Age determination by tooth eruption and wear and by epiphyseal fusion of longbones indicate that all of the camelid burials were sacrificed at six to nine months of age and that most of the guinea pigs were also juveniles.

Shell (Christine Hastorf)

Only 12 small pieces of shell were collected during the excavations. As yet, two pieces of *Spondylus* have been identified. The very scarce shell suggests that marine shell and the necessary long-distance trade networks to get it were not common for the population of Pancán. Throughout all of the Sausa prehistoric record, there is little evidence of much long-distance shell trade.

Human Burials (Christine Hastorf)

Eighteen human burials were uncovered at Pancán. No interment was well-preserved, so it was difficult to excavate an intact skeleton. All skeletons were found in pits. These were either simple, shallow-cut holes or deep vertical L-shaped shafts with a wide base at the bottom. Although analysis has not yet been completed, all individuals except two seem to be adults. The two children were both uncovered together along with two adults in the same pit. Bodies were tightly flexed, lying on their sides, most often facing north. There was one exception: a loosely flexed adult who lay directly on the floor of structure 16. Five interments were found within four "shaft" tombs, some terminating below the 1986 excavations.

Not all burials contained offerings, but most did. Most common were small ceramic vessels and spindle whorls. Only two burials, both in level 4, contained metal offerings. Probably the most noteworthy observation about the human burials is the fact that all of them were within levels 2, 3 and 4; none occurred in level 1. Like the metal distribution, this difference suggests a shift in human burial practices from the Early Intermediate Period into the Late Intermediate Period. In the earliest levels, inhumations were in deep pits within structures. Later, in the Wanka I times, the burials were located somewhere else, away from daily activity.

Discussion (Christine Hastorf)

The 1986 survey built on and clarified earlier regional work. The research at Pancán provides the first context-oriented excavations in the Jauja region covering the time periods spanning the Early Intermediate through the Late Intermediate Periods. Architecturally, we discovered both change and continuity in the regional sequence. The following discussion synthesizes our knowledge of that sequence.

Structures exposed from excavations in Formative sites (Browman 1970; Matos 1972; Garcia Soto, pers. comm. 1986) display rectangular adobe with white chalky plaster surfaces, some over 4.5 m wide.

In the Early Intermediate Period at Pancán, we found circular structures. These were large as well, up to 6 m across. The adobe bricks sat on large foundation stones of double thickness with silty mortar in between. The large foundation stones were of irregular shape and came from local valley outcrops. Clumps of white chalk were found occasionally, suggesting that some of the walls might have been plastered; other walls showed a fine grey clay covering the adobe bricks. Floors had a fine yellow silt on top of the building foundations. Animal and human burials tended to be located below the floors in these patios.

In the Early Intermediate Period-Middle Horizon of the northern Mantaro region, the patios seem to have been spacious, and perhaps they were not completely walled in. Architecturally, we cannot describe the sites on the knolls in the late Early Intermediate times other than to report that stone walls surrounded at least some of the sites and that the structures were probably built out of limestone rock, the local material.

In the Wanka I-Late Intermediate Period, the structures were smaller, averaging around 3 m across, although there seem to have been more structures within any one patio. The patio spaces also seem more enclosed and smaller. Less effort seems to have been expended in constructing floors within the

Wanka I structures. Pits, which were common in the earlier periods, do not appear as frequently in the later structures. With the major relocation uphill in Wanka II times, the structures changed to two-faced limestone *pirka* walls. This stone was quarried at the settlements. Wanka II patios are always walled in and provide even less evidence of purposeful floor construction. This same patio layout continued in Late Horizon Wanka III times, influenced somewhat by Inka style rectangular structures.

Although the architecture changed throughout the sequence, the organization and use of habitation space seem to have remained constant. From this we can surmise that the settled population was the same cultural group throughout. In general, features in the patio compounds were used in the same ways. Hearths remained simple and are found both in the structures and in the patio spaces where they seem to be casually placed, that is, they have been found in various positions within patios and structures. There is almost always more than one hearth per patio compound.

The structures, too, suggest that they were built at different times during the uselife of any one patio. The structures have different orientations facing into the open space. The dense midden is often pushed up against patio and the internally dividing walls, as well as in the areas between structures. Human burials, when encountered, are within structures, in patio spaces, sometimes on top of each other, and also were found in a general activity area.

From the architectural data, we now believe that we are dealing with households when we discuss a walled patio area (Wilk and Rathje 1982). A household in this case is a social unit that produces for itself while it reproduces itself, although it can be made up of more than a nuclear family and the members may move between more than one place. In most instances it is the unit where needs are met, most goods are produced, and resources are pooled. In this sense it seems to be a stable social phenomenon that resists structural change, although its own composition may change.

Preliminary conclusions from the settlement survey and the excavation data indicate that the Sausa did change politically and economically during the prehistoric sequence. Although the household remained the social unit, it is clear that the population joined together at times--moving in large groups into new settlements--and dispersed at other times. Artifactual evidence also suggests shifts in agricultural and eating patterns. These changes suggest that social inequalities became more pronounced through time, which generated higher-level decisions about political issues, banding together, moving the settlement, or joining other communities. The larger-scale political structure certainly would have affected economic decisions at the household level, and also at the neighborhood and village levels.

During the Formative times, the groups settled near small streams in productive, protected locations with vistas of the surrounding area. This pattern continued into the Early Intermediate Period as new settlements broke off and dispersed around the valley edges. The population might have declined as they moved into more fortified locations. We still do not know if these were permanently occupied sites or only temporary defensive locations. The hilltop sites await further investigation. The settlement-pattern change that occurred sometime in the late Early Intermediate Period suggests that at least some of the population started new settlements on the valley floors.

In the following Wanka I period we first see increased evidence of valley occupation with the use of stone hoes for agriculture. Probably a more intensive agriculture was practiced than before, perhaps with deeper plowing of the fields or plowing in more clay-rich soils. From both the Pancán and survey data during this time period, it appears that the sites are slightly larger, the household compounds are more densely packed, and the ceramics become more diverse, yet they have more restricted loci of production. At Pancán the vessels became larger, perhaps representing large membership in the domestic compounds. The Wanka I data suggest that the population was beginning to change its internal social and political organization with more clearly demarcated alliances. These changes, hinted at in the production and settlement data, are borne out in the radical changes seen in the next period, the Wanka II.

In the Late Intermediate Period-Wanka II times the population not only moved up to higher, less accessible locations, but groups that had previously been separate communities were aggregated. This restructuring of the Sausa is also visible in the lithic material: new technologies of blade manufacture and crop processing are evident. Agricultural hoes became much less common and new agricultural technologies appropriate to the uplands (canals and stone lined terraces) were initiated (Hastorf 1983). Compared to the earlier periods, the ceramics were less carefully manufactured, the designs became less codified, and the sizes were smaller. Specific loci of production can be identified, as can restricted spheres of ceramic trade (Costin 1986).

After the Inka conquest, the population again relocated down in the valleys into smaller settlements. We know that local household production changed, especially in the items that the Inka were interested in extracting: metals, maize, cloth, and certain Inka ceramic types. The effect of the Inka conquest is seen in many aspects of the Sausa artifact assemblage as well as in the settlement pattern change (Earle et al. 1987). Inka and imitation Inka ceramics were found on all sites (D'Altroy 1981). Would we not see the same types of impacts if the Wari, too, had conquered the Sausa earlier?

In all, we uncovered only three Wari sherds and three Wari-related sherds at Pancán (the only good context was in the upper part of level 3), and two from the survey, suggesting that the Wari did not have a direct material influence in this region. Perhaps the settlement pattern changes can be attributed to the pressure of Wari's collapse, but at this time we find no architectural evidence for direct pressure on the Sausa by the Wari during the time period when Wari could have been present. Changes in production and access might be the best indication of the Wari impact. This idea will be addressed in a different paper.

The impression our data give us is of cyclical yet spirally intensifying internal political leadership development, reflected in the Sausa aggregating in protected, less productive areas, and then dispersing again. Although aggregation happened twice it was not repetitious, as new political forces and alliances must have been at work with each new cultural phase. All these preliminary summaries will be rethought and refined as the various data are analyzed further.

Despite the need for more work on the earlier phases, we have been able to identify political and social influences in the data presented here. The Formative Period and the early Early Intermediate Period now must be investigated further to understand how the Sausa were involved in the early pan-Andean system (Matos 1972). Work on the late Early Intermediate Period sites, dating both them and the activities that went on in them, will help identify the causes for these political, social, and economic changes and their consequences for the household units. These political actions seem to have been initiated outside of the households and did not restructure them. They must have affected the households, however. One cannot avoid noticing local practices while completing field work in the Andes, and in the Sausa region today, the household within its barrio is still extremely strong, continuing to be the unit of production and reproduction for its inhabitants, despite new and continued internal and external pressures.

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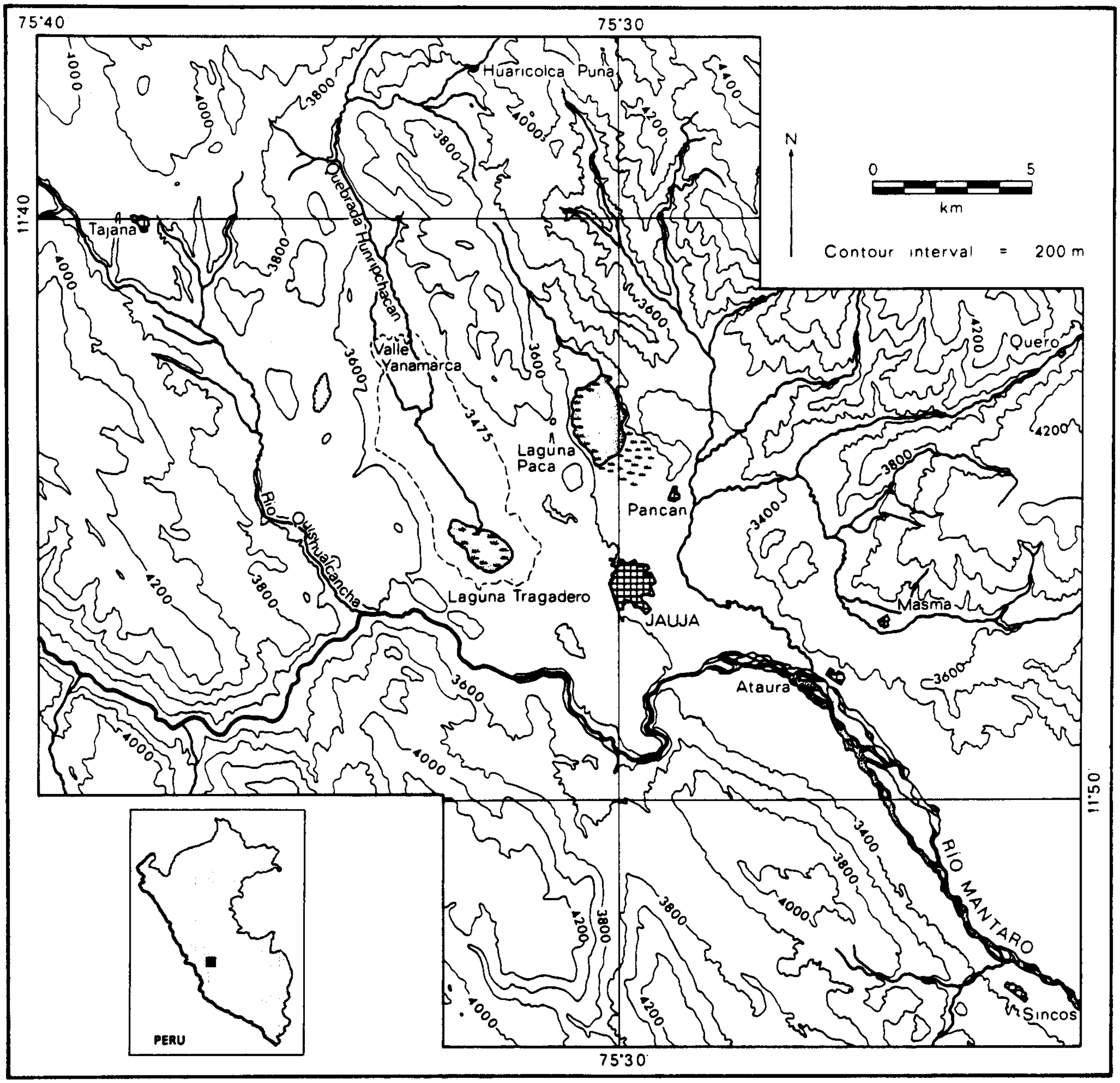


Figure 1. The Upper Mantaro Study Area. The inset of Peru displays the location of the study region within Peru.

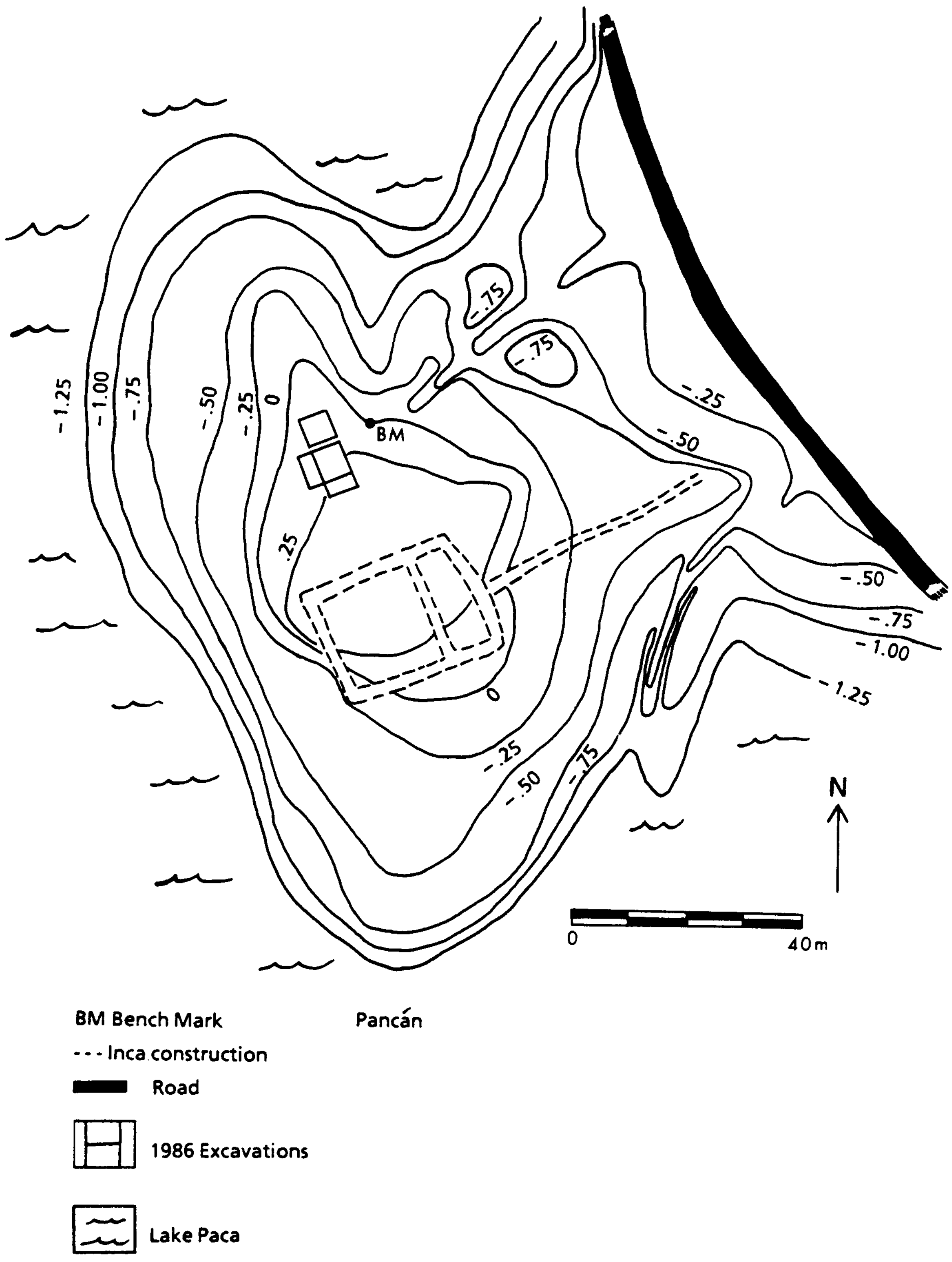


Figure 2. Topographic map of the site Pancán.

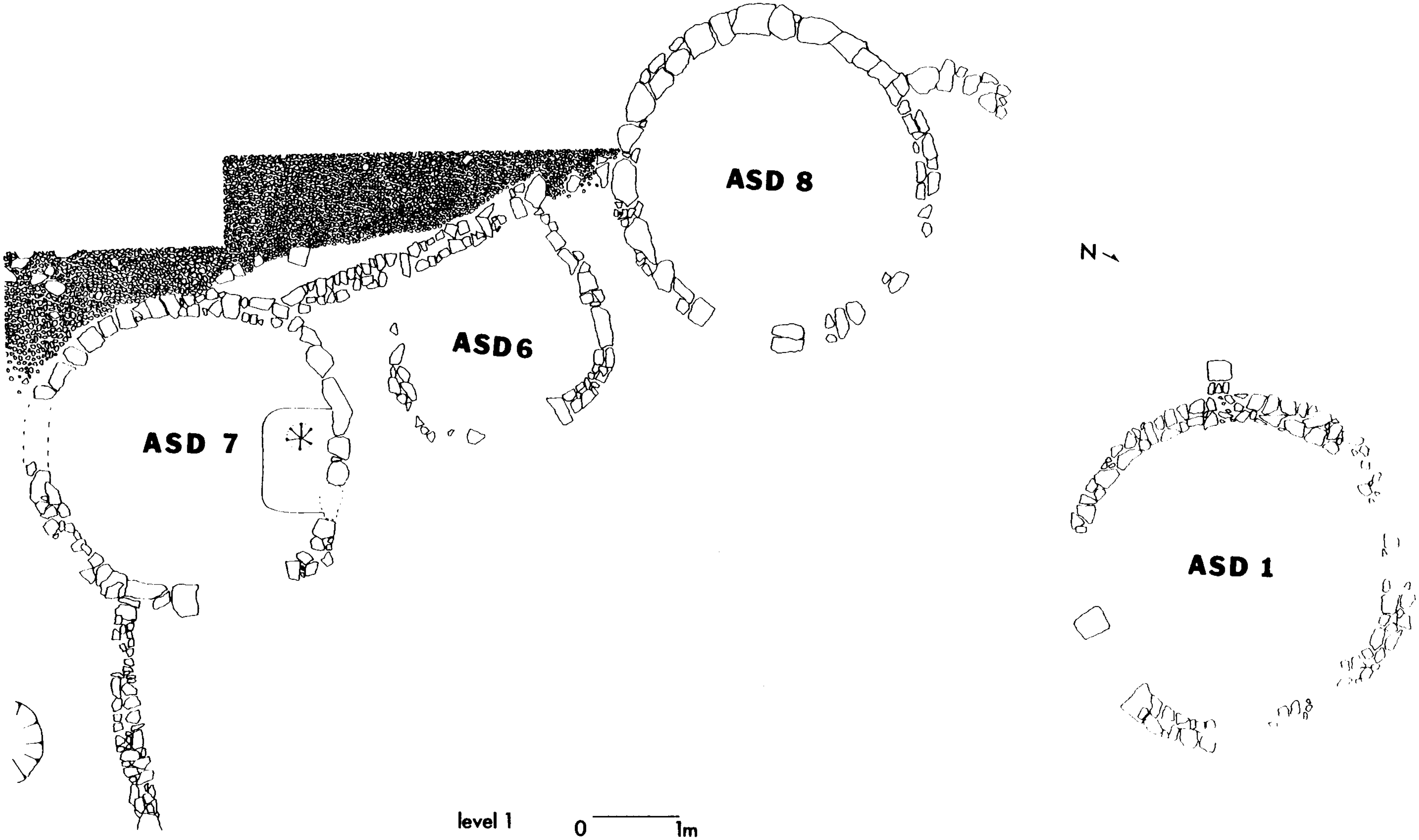


Figure 3. Level 1, Pancán.

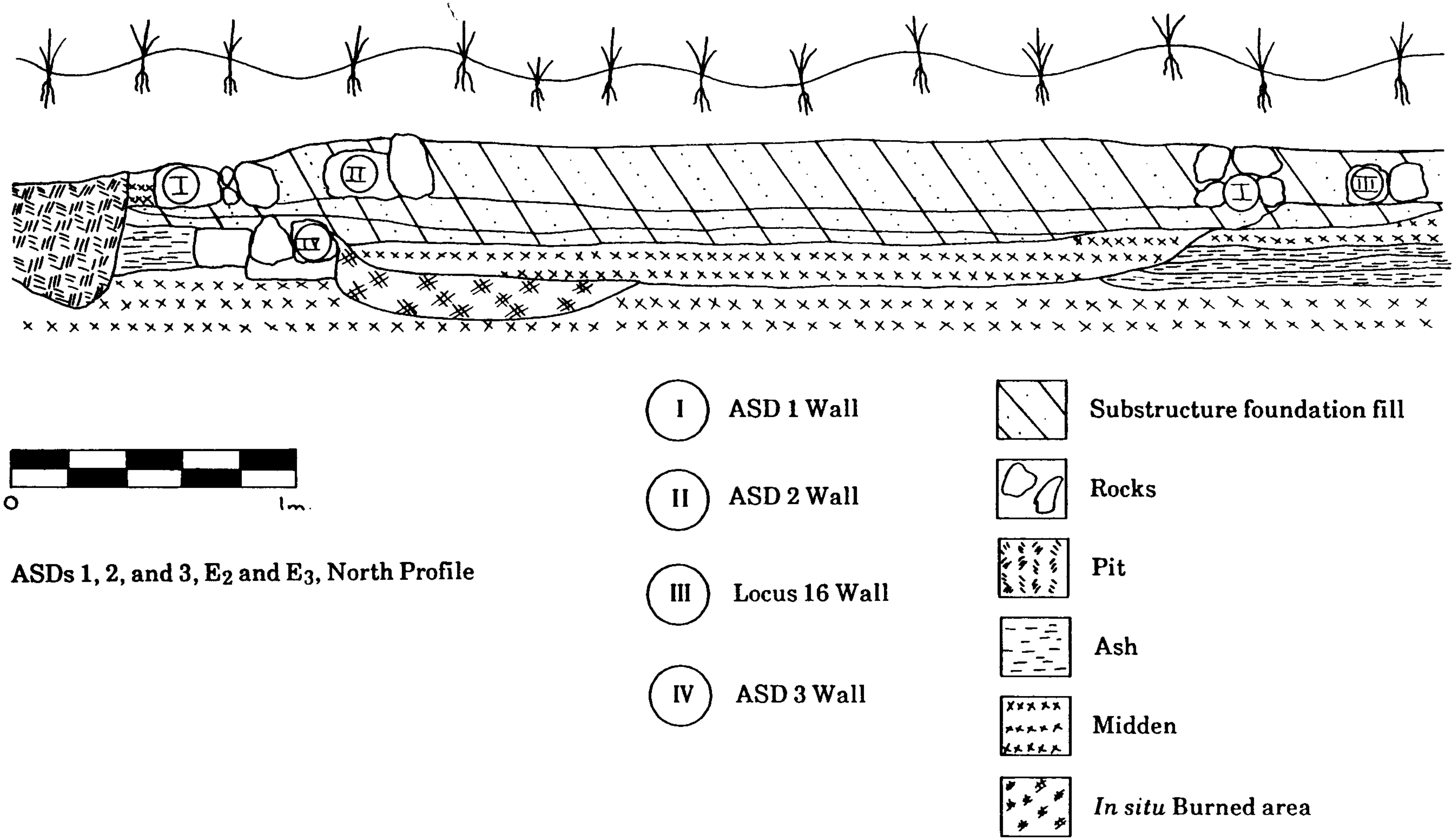


Figure 4. Profile of ASD 1 and 2, Level 1, Pancán.

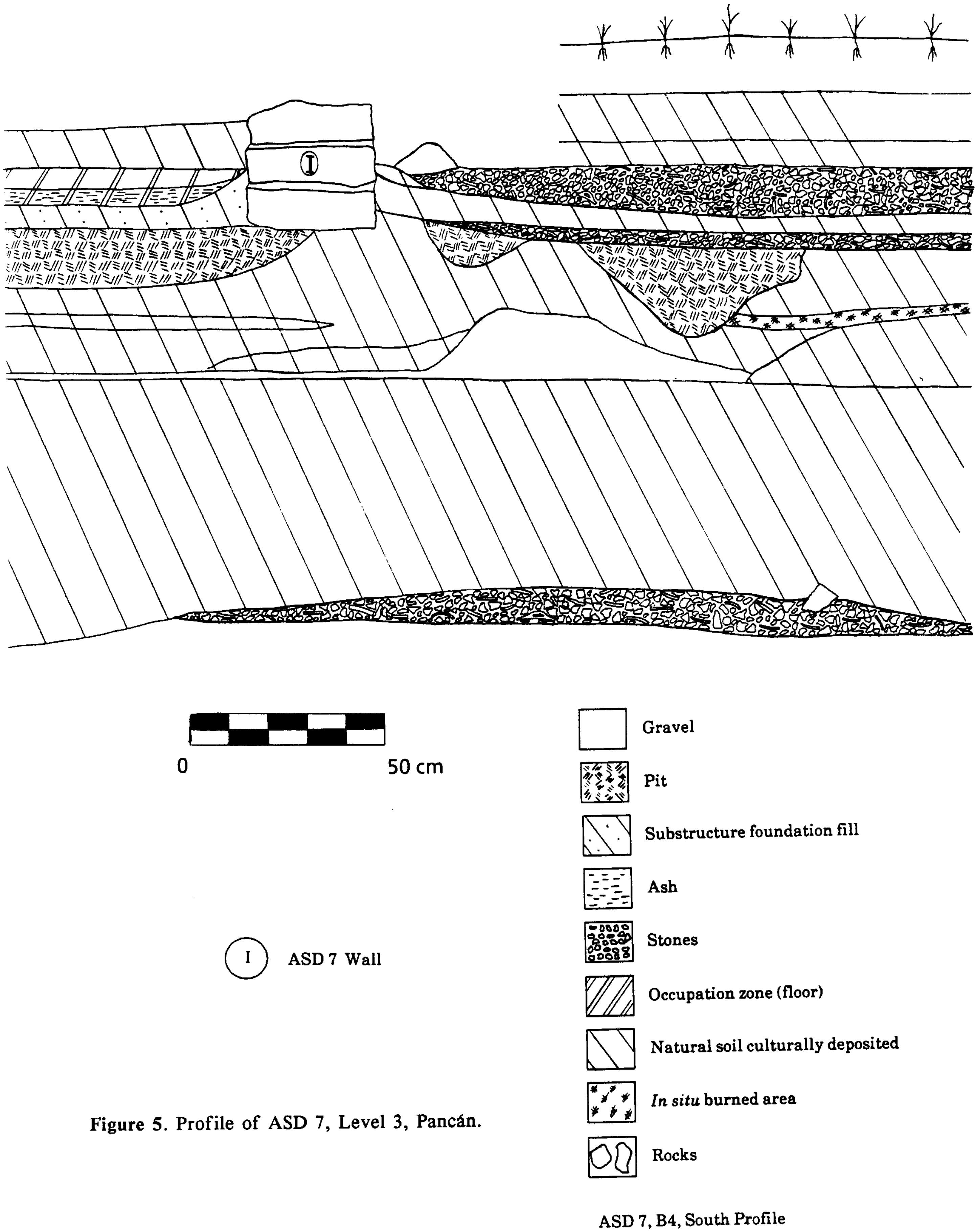
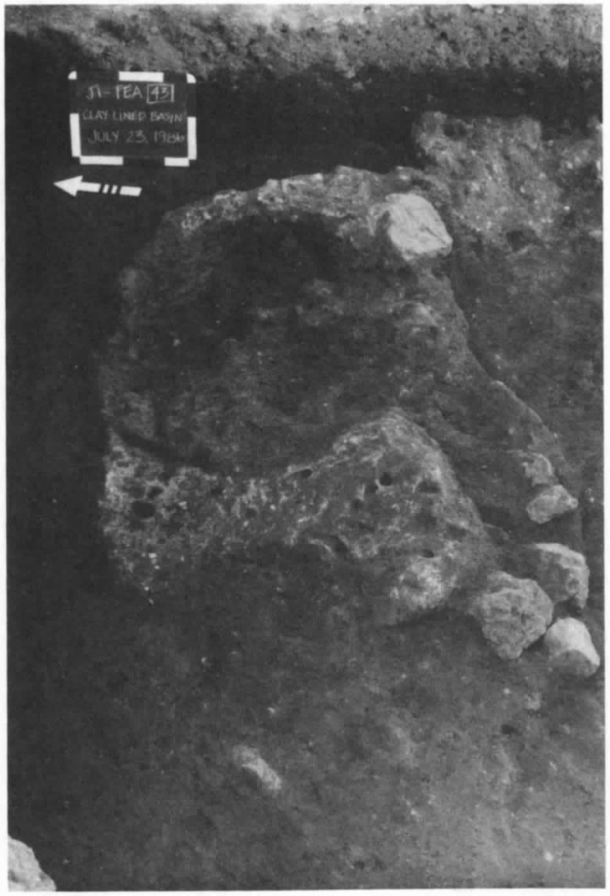


Figure 5. Profile of ASD 7, Level 3, Pancán.



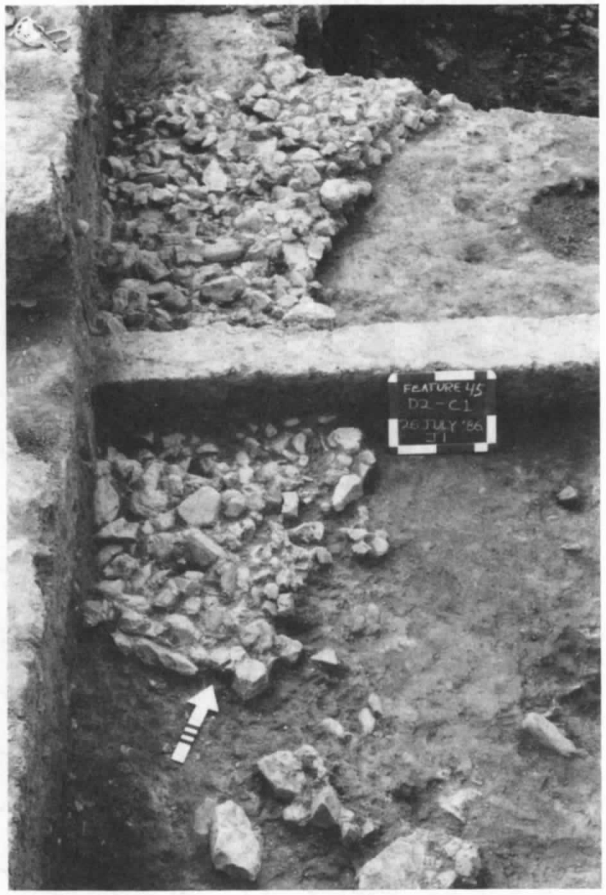


Figure 6 (*left*). Clay lined, chalk plastered pit with pure clay inside, Feature 43, Level 2, Pancán. Scale on chalk board, one color block = 10 centimeters.

Figure 7 (*right*). Cobble pavement, semi-circular shape, Feature 45, Level 2, Pancán. Scale on chalk board, one color block = 10 centimeters.

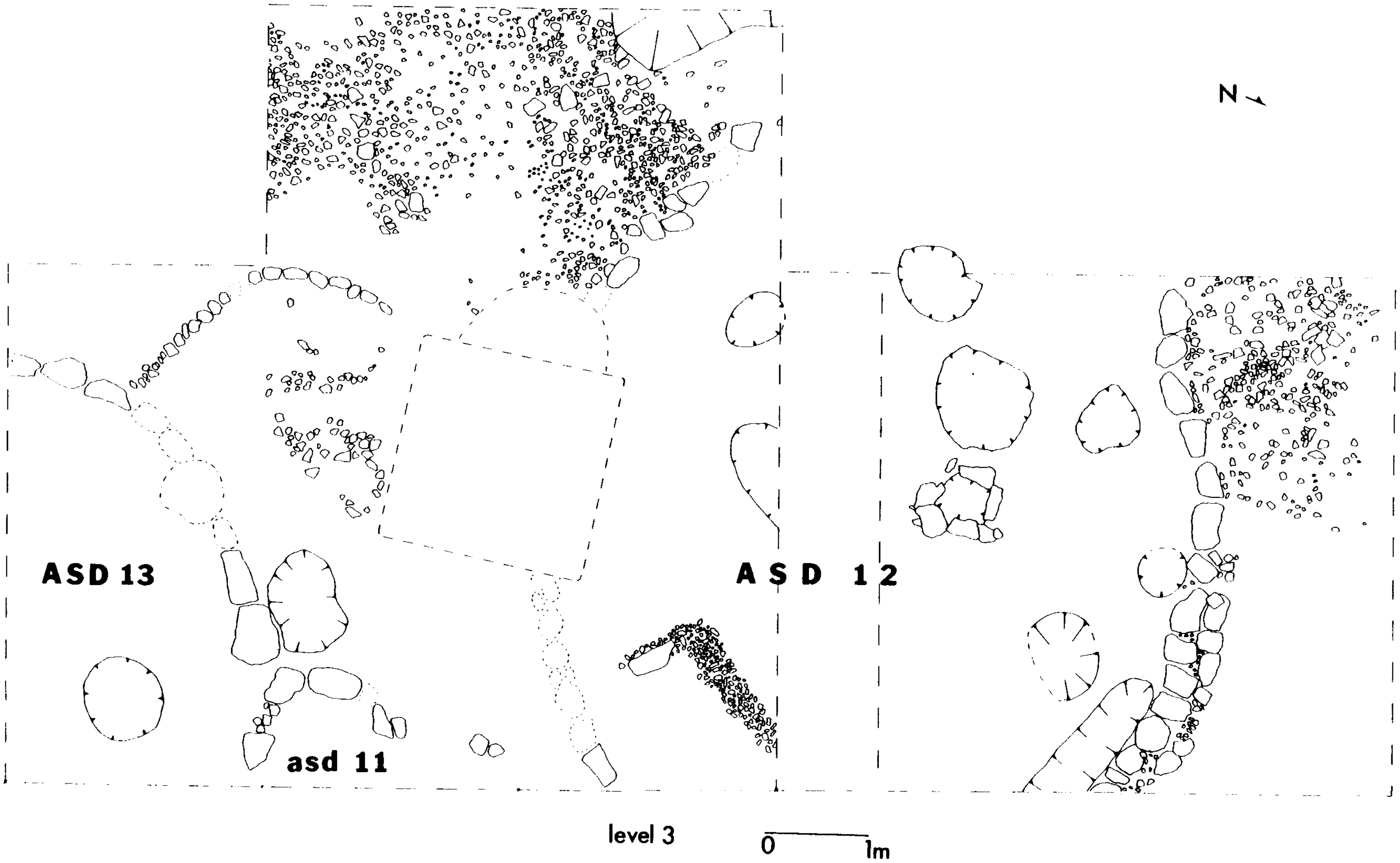


Figure 8. Level 3, Pancán: ARCDIV 4.

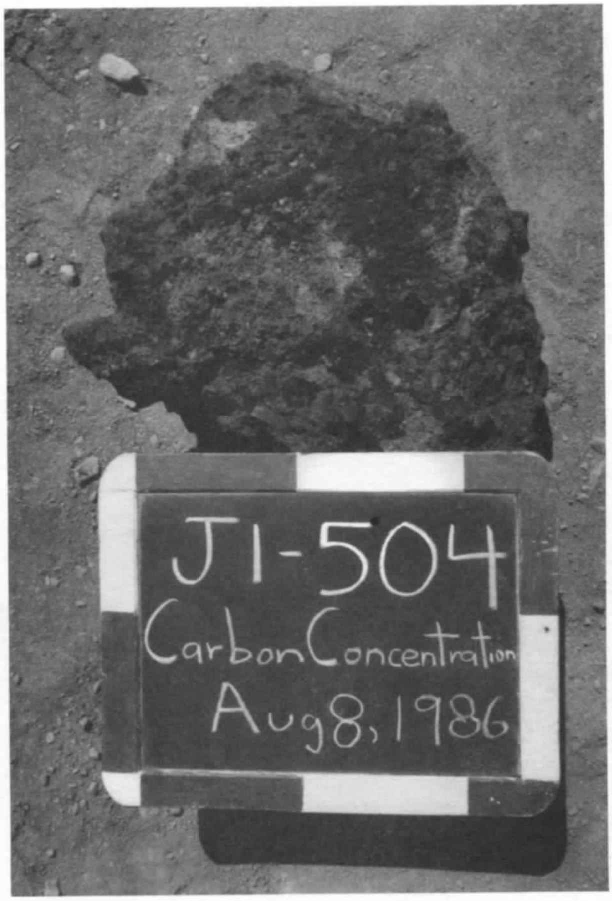


Figure 9. Carbon concentration from locus 504, the floor of ASD 12, Level 3, Pancán. Note the piece of wood at the top and tubers at the bottom. Scale on chalk board, one color block = 10 centimeters.

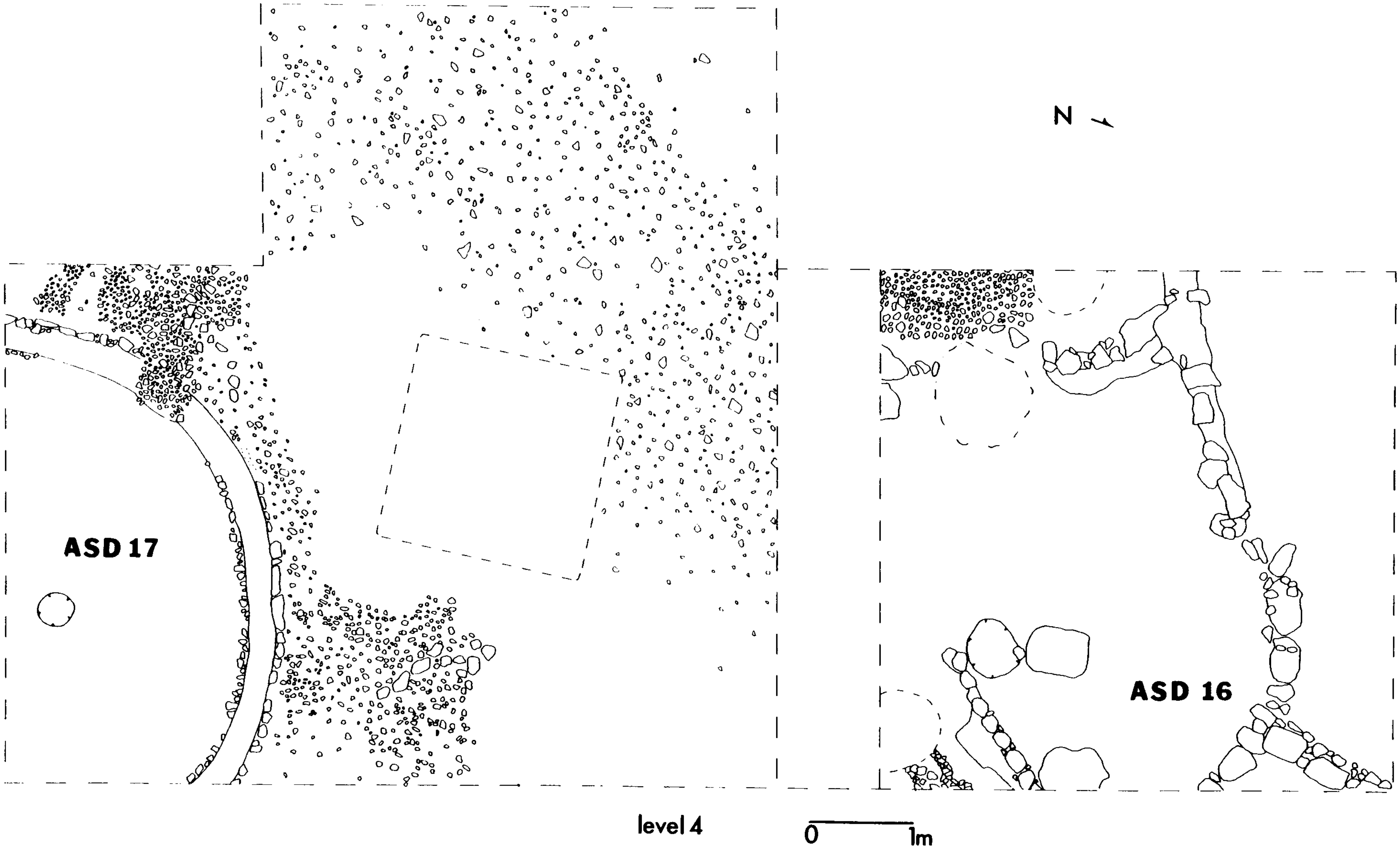


Figure 10. Level 4, Pancán: ARCDIV 6.

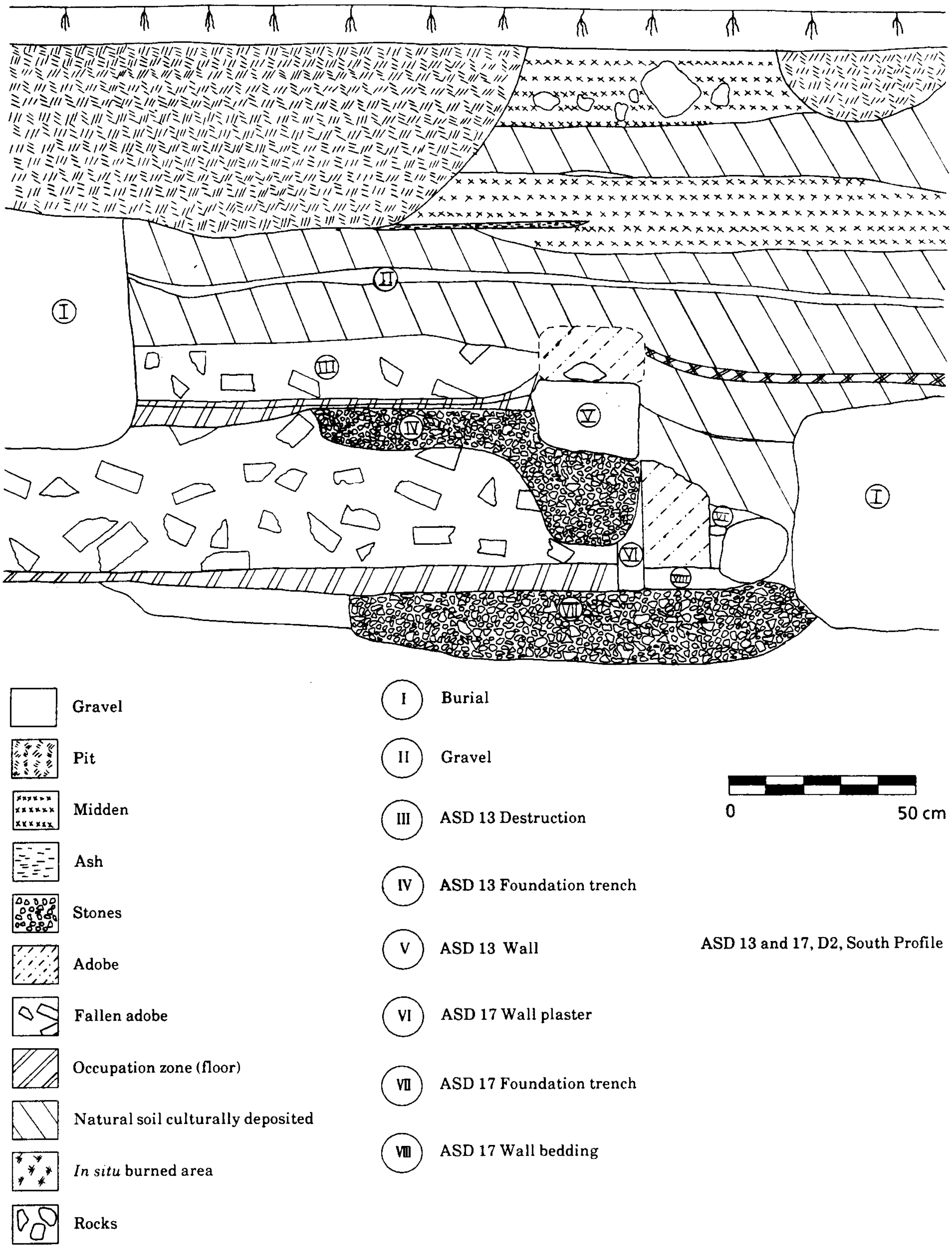


Figure 11. South profile of the Pancán excavation showing ASD 13 and 17.

Figure 12. a (*left*). Adobe wall foundation, ASD 17, Level 4, Pancán. b (*right*). Close up of the adobe still *in situ* in the wall. Scale on chalk board, one color block = 10 centimeters.

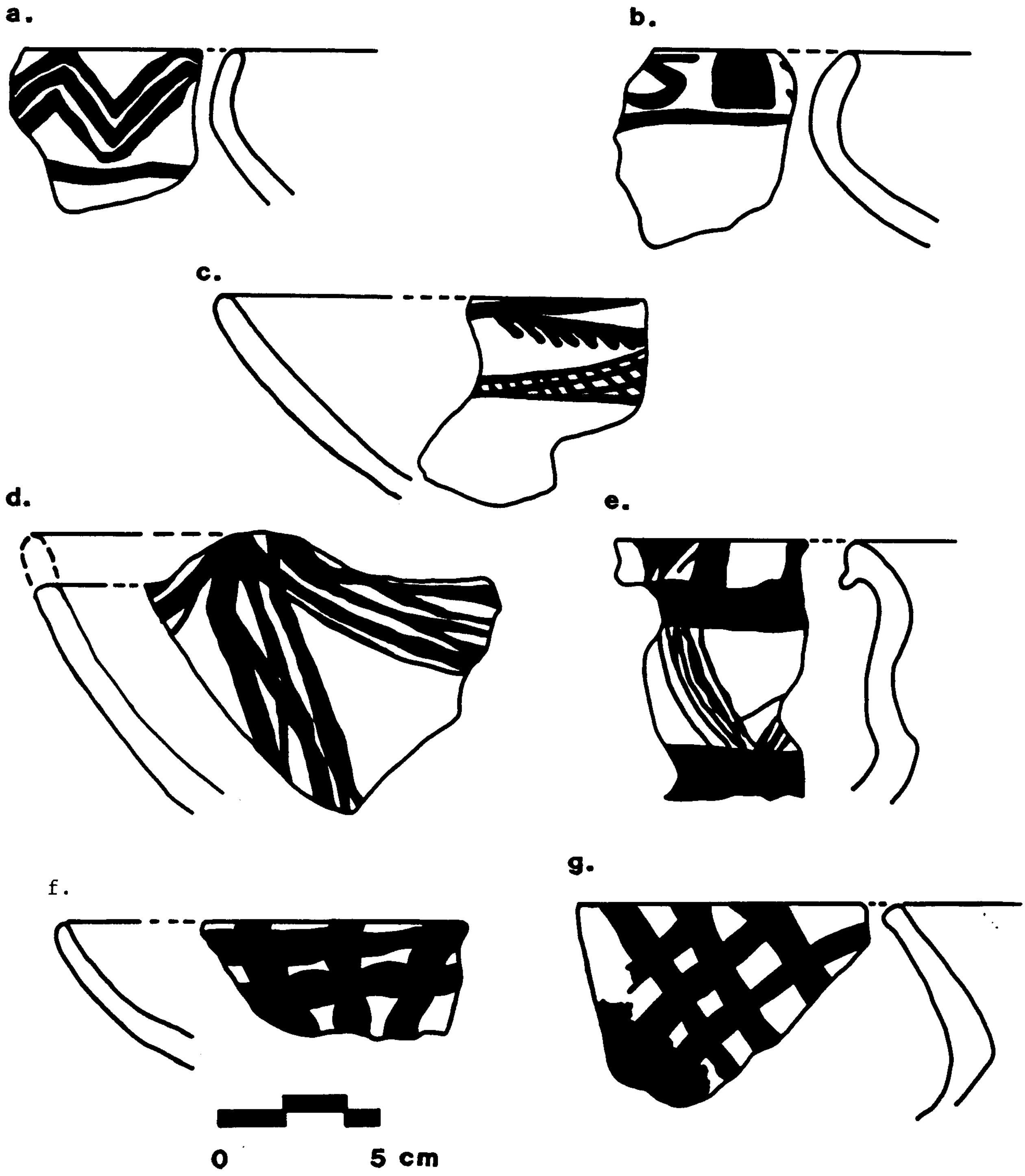


Figure 13. a. Cochachongos red/black on light unslipped paste. b. Cochachongos purple-on-light paste. c. Pink paste ware, purple on paste. d. Huacrapukio purple-on-orange paste. e. Huacrapukio purple-on-orange slip. f. Wanka purple-on-light paste. g. Andesite purple-on-light paste. The dark color on the drawings represents purple.

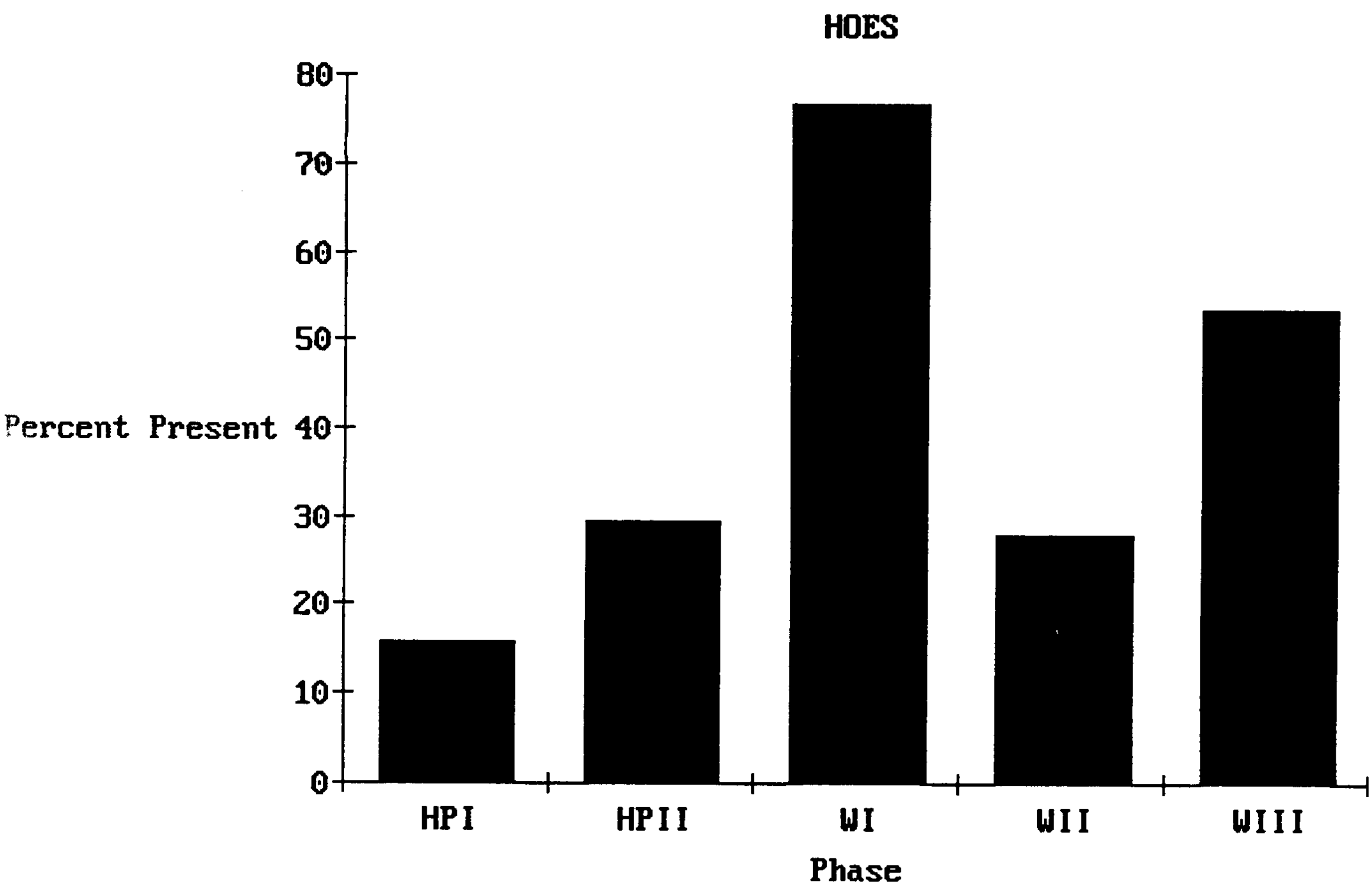


Figure 14. Percentage presence of stone hoes throughout the sequence from all survey and excavation data.

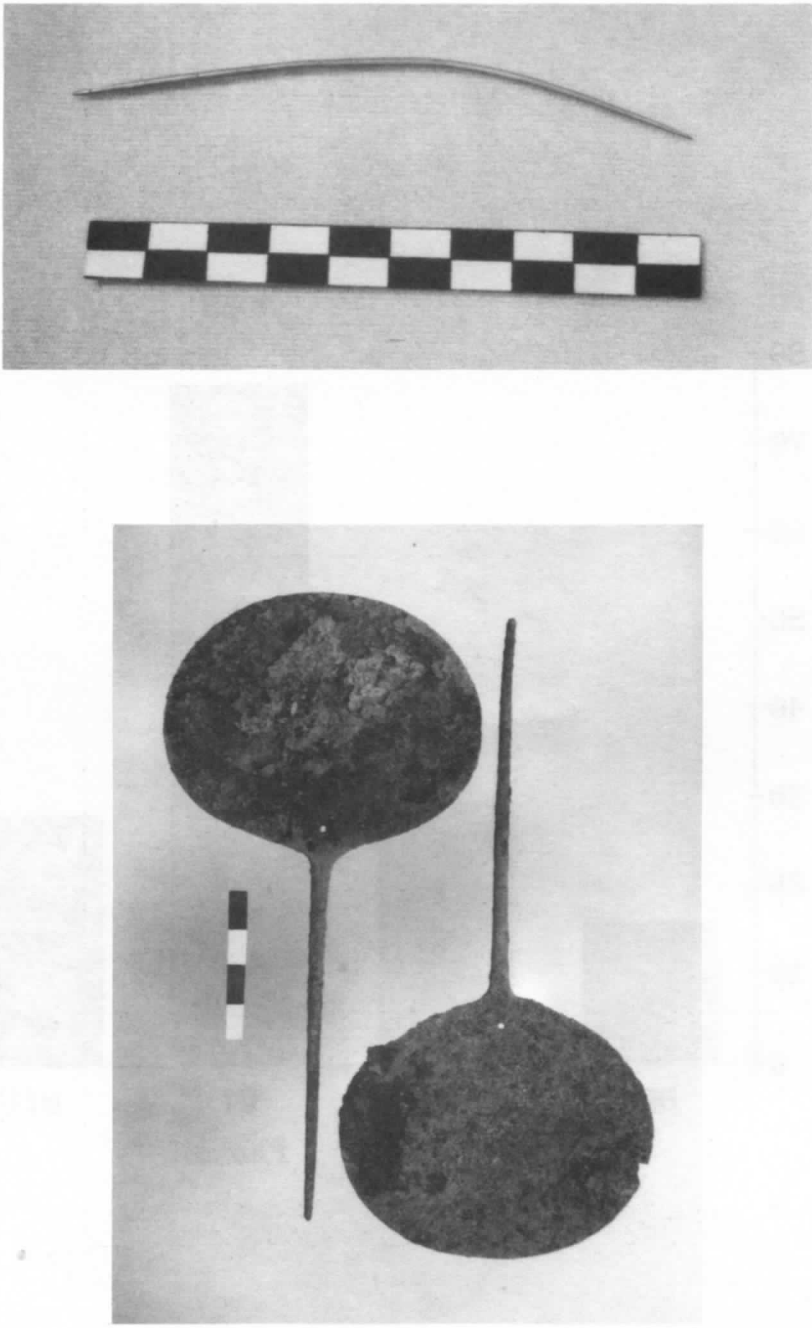


Figure 15. a (*above*). Gold needle, catalogue no. 739, 2.0 grams. Scale is 10 centimeters. b (*below*). Copper *tupus*: Head at top: catalogue no. 743, 41.9 g; head at bottom catalogue no. 744, 37.9 g, Pancán. Scale is 4 centimeters.

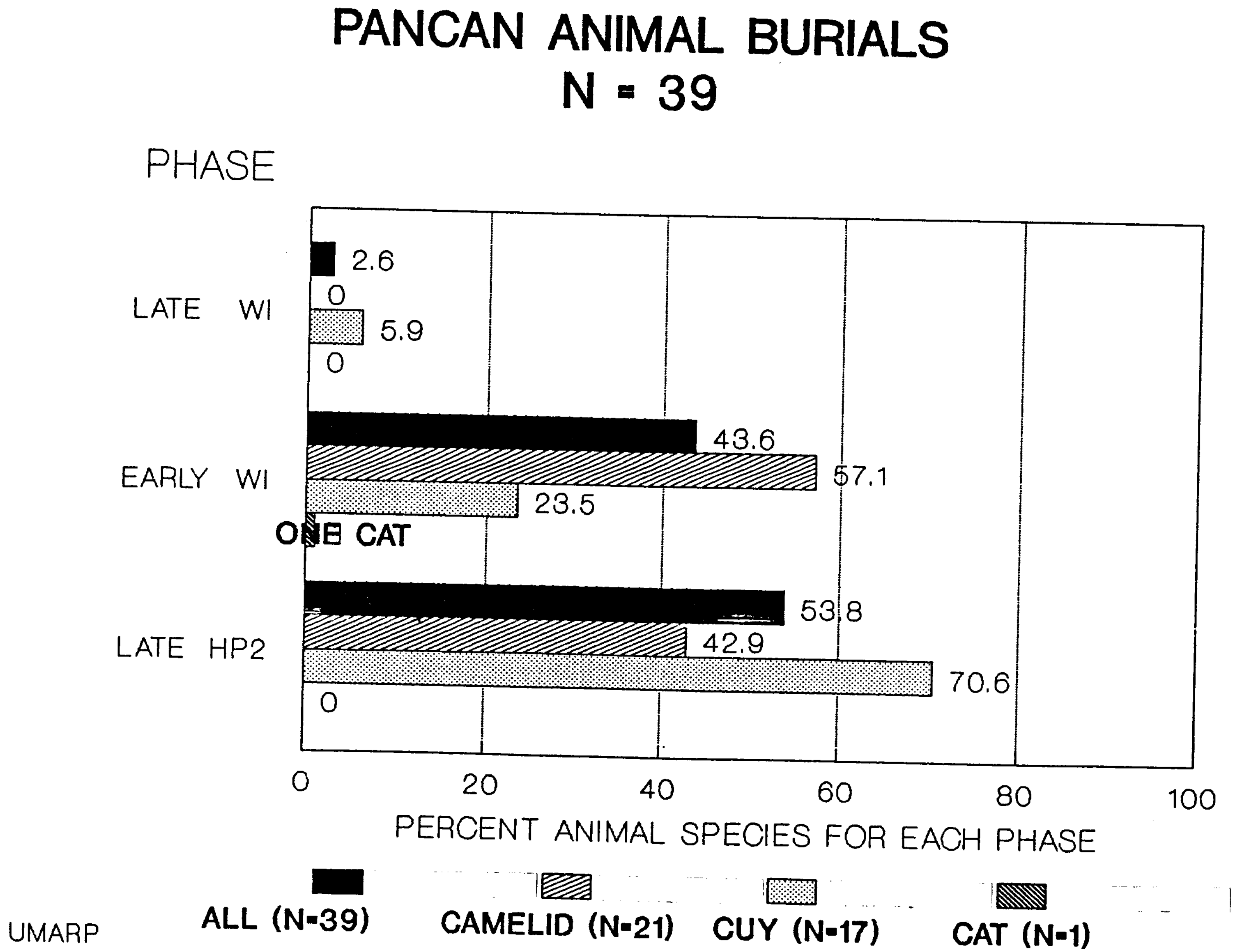


Figure 16. Pancán animal burials, percents by level, total number of burial (n) = 39.