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Perspectives on Andean Prehistory and Protohistory: Papers from the Third Annual Northeast Conference on Andean Archaeology and Ethnohistory

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PERSPECTIVES ON ANDEAN PREHISTORY AND PROTOHISTORY

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Edited by Daniel H. Sandweiss and D. Peter Kvietok

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Preface

The contributions in this volume represent eight of the eighteen papers presented at the Third Annual Northeast Conference on Andean Archaeology and Ethnohistory (NCAAE), held at the University of Massachusetts, Amherst, on October 27 and 28, 1984. In addition, the volume includes a paper by Patricia J. Netherly and Tom D. Dillehay that was presented at the Second NCAAE in 1983 and a paper by Netherly submitted in place of her presentation at the Third NCAAE.

The Northeast Conference is a continuing annual event designed to provide an opportunity for Andean scholars in northeastern North America to present current research in an informal setting. The Publication Series, of which this is the third and final volume (see: D.H. Sandweiss, editor, 1983, *Investigations of the Andean Past*, Ithaca: Cornell Latin American Studies Program; and D.P. Kvietok and D.H. Sandweiss, editors, 1985, *Recent Studies in Andean Prehistory and Protohistory*, Ithaca: Cornell Latin American Studies Program), has given us the opportunity to distribute these reports relatively quickly and inexpensively to a wider audience of Andeanists and other interested scholars. Following this volume, the Publication Series will be replaced by **ANDEAN PAST**, a series of edited and reviewed collections of articles on Andean archaeology and ethnohistory. **ANDEAN PAST** is open to submission from any scholar working in the Andes, but we also hope to continue publishing many of the reports presented at the Northeast Conferences. The Northeast Conference on Andean Archaeology and Ethnohistory is the official sponsor of **ANDEAN PAST**.

The assistance of a number of individuals and institutions was essential in organizing the Third Annual NCAAE and in preparing this volume. The Department of Anthropology at the University of Massachusetts, Amherst, provided financial support for the Conference. Donald A. Proulx organized the meeting and kindly gave us permission to publish the reports. We are particularly grateful to the Cornell Latin American Studies Program (LASP) and its director, Thomas H. Holloway, for their continuing support of the Northeast Conference and its publications. The Fifth Annual NCAAE will be held at Cornell and sponsored by LASP, as was the original conference in 1982. Lourdes Brache of LASP has been consistently helpful and very patient with the constant invasion of her office in pursuit of the mundane details of publication. Finally, we thank the authors of the papers included in this volume for their energy and goodwill in preparing their manuscripts for publication.

Daniel H. Sandweiss
D. Peter Kvietok

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GENERAL INTRODUCTION

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This third collection of articles from the Northeast Conferences on Andean Archaeology and Ethnohistory (NCAAE) demonstrates the high level of commitment and interest which the NCAAE meetings have generated. The articles in this volume, like those in the previous two NCAAE volumes (Sandweiss, ed. 1983; Kvietok and Sandweiss, eds., 1985), cover a wide range of geographical regions, research issues, and methodological approaches, united by their focus on the past cultures of the Andes. Each contributes in its own way to a changing perspective on our understanding of that world by questioning some of the traditional interpretive models we have created in the past.

Breaking from the chronologically-ordered schemes of the previous volumes, we have chosen to group the articles in this book on the basis of methodological categories. One category is primary archaeological fieldwork, as seen in the Malpass and Netherly papers. These investigations add to a slim body of published data for their respective study regions. A second category includes the analytical papers by Kaplan and Bonnier, Chiswell, and Arnold, which indicate the growing application of basic laboratory methodology to archaeological studies in the Andes. The botanical papers (Kaplan/Bonnier, Chiswell) report on the results of flotation analysis from highland sites, long thought to be an unrewarding endeavor in this area because of poor preservation. The results of these studies indicate the necessity for re-evaluating that assumption. Arnold uses standard metallographic techniques to document apreviously unreported variation of metal casting in the Andes. The final grouping of papers represents the synthesis of field and analytical data (laboratory or archival) for the purposes of explanation and testing of past generalizations. Wallace and Daggett shed new light on the nature of population interactions during the Early Horizon and the Early Intermediate Period. These papers synthesize data from two areas of Peru which have been relatively neglected in past research, the north-central coast and the south central coast. Topic draws upon years of field experience in the Huamachuco area to construct a temporal seriation of niched halls spanning at least 400 years. The Dillehay/Netherly and Barnes papers focus on the potential for retrieving social information from archaeological, historical, and ethnological studies.

We chose to order the articles according to the above categories in order to symbolize the varied input from which the volume has benefited and the methodological standards it tries to uphold. Interpretation of past social systems has gained credibility due to the effective combination of archaeological fieldwork and laboratory and historic analyses as seen in the Netherly, Netherly/Dillehay, and Barnes contributions to the volume. The ability to model socio-political systems in the absence of a historic record implies a belief in

historic continuity, but it also implies the construction of a solid theoretical framework and research design to allow one to arrive at conclusive results. Analogously, the study of Inka prehistory has been aided by the existence of a rich historical record that has been studied by numerous scholars. Several contributions in this volume (Malpass, Chiswell, Topic) complement the ethnohistoric record by integrating it with recent archaeological fieldwork and analysis of the archaeological finds. Malpass and Topic are concerned with the continuity of Inka-associated constructions, and their recent excavations add temporal depth to the terracing and niched hall traditions. Chiswell provides a conservative confirmation of the hypothesis of functional differentiation in Inka storehouses through the results of her excavations and subsequent botanical analysis. The multiplicity of methodological alternatives and the structure of the scientific method provide the continuity in the presentation of these articles, but also the dimension which collectively links them closer to the Andean past.

Patricia Netherly reports on the Tahuin project, a salvage archaeology program initiated in 1978 in Southern Ecuador. Extensive survey and limited test excavations were carried out in the Arenillas valley, much of which is now inundated by the Tahuin dam. The project area crosscuts several ecological zones: mangrove-forested coastline, coastal backswamp, desert scrub, tropical dry thorn forest, and humid tropical montane forest. The middle Arenillas valley, an area with rich and level bottomland, was the area selected for intensive testing. Human occupation of this zone was dense, and Netherly suggests that a two-level site hierarchy existed. A number of the inland sites were observed to have extensive shell middens dominated by the marine mollusc *Anadara tuberculosa* and dating to the Early to Middle Jambeli phases. Midden excavations at one of these sites, Romero, uncovered a broad band of marine shell and a high percentage of marine fish remains, with comparatively few terrestrial faunal remains. The faunal assemblage is dominated by large marine fish and young shellfish, perhaps selected for ease of transport.

Netherly suggests that the midden contents are atypical for the region; the only comparable site is Loma Alta, 15 km. inland on the Valdivia river. A period of inter-regional, socio-political cohesion during the Early to Middle Jambeli phases may explain the restricted temporal and spatial location of these sites with marine-focused midden contents.

Michael Malpass presents the results of a multi-disciplinary project studying the terrace systems in the Colca valley of southern Peru. The project brings together the collaborative efforts of geographers, archaeologists, ethnohistorians, and soil scientists to study the processes behind the high level of terrace abandonment in the Andes, estimated by the principal investigator (William Denevan) as approaching 60 percent.

Malpass approaches the paucity of prior archaeological research in the area by first summarizing the ethnohistory of the Colca valley. Two principal ethnic groups occupied the region protohistorically, the Quechua-speaking Cavanas and the Aymara-speaking Collaguas. Malpass finds that one expression of their ethnic identities is seen in occupational site segregation within the valley. The Cavanas occupied the temperate zone of the valley, while the Collaguas occupied the central and upper portions of the Colca basin and also maintained close ties with the coast and altiplano. The nature of the Inka presence in the valley is very vague, but it is known that the Collaguas maintained a strong ethnic

identity throughout the Late Horizon.

Turning to the archaeological data, the local Chuquibamba ware, related to the Churajon wares of the Arequipa region and the Colloa and Allita wares from the altiplano, dates from the Late Intermediate Period-Late Horizon. Inka influence is difficult to distinguish in this local tradition, but architectural styles may help to distinguish the Collaguas from the Inka settlements. Excavations in the terraces and adjoining structures at three sites (Chijra, Chilacota, and Yurac Ccacca) defined at least three phases of terrace construction, spanning the Late Intermediate Period and the Late Horizon. Dating is based on reconstructed building sequences and associated ceramics. The nature of the terrace fill presents potential interpretive problems for the ceramic dating, but proportional differences in the ceramics found in primary, domestic refuse suggest functional differences between construction phases. Additional support for the terrace sequence comes from architectural variation. The formal organization of the later-phase terraces is similar to Inka terraces elsewhere in the Andes, while the earlier phase is distinguished by random organization of terraces.

A general pattern emerges of early phase construction of the upper terraces (Chijra, Chilacota), which dates to the Late Intermediate Period and is probably related to the Collaguas occupation. The lower terraces were constructed in the late phase (Yurac Ccacca) and may represent a noncontemporaneous occupation or a re-use and remodeling of terraces in the Late Horizon. Future research priorities are aimed at refining the archaeological dating and focusing efforts on answering the questions of large-scale terrace abandonment.

Dwight Wallace provides an important overview of the Topará tradition, one which is not a changing perspective, but a rather newly emerging one. Tello and Strong both uncovered Topará or Topará-influenced materials during the course of excavations at Paracas and Cahuachi respectively, but it was the work of Lanning and Wallace that isolated the ceramic phases and cross-dated them. Briefly, the six phase sequence proposed by Wallace consists of: Los Patos, Jahuay 1, Jahuay 2(A&B), Jahuay 3, Chongos, and Quebrada. This sequence spans the time from the late Early Horizon to the early Early Intermediate Period. Wallace suggests that Topará cross-dates with the Miramar style of the central coast, with influences seen in Ocucaje phases 8, 9, and 10 and Early Intermediate Period 1 of the south coast Ica valley. The Topará sequence is followed by the Carmen phase, dating to Early Intermediate Period 3-4. Carmen is fully out of the Topará tradition. Stylistic evidence from Topará textiles suggests a tradition which is reflected in the Geometric substyle of Paracas textiles, but is quite distinct from it.

Wallace provides a concise description of the ceramic tradition, which can be summarized as consisting of technologically refined wares with very simple or no decoration, quite distinct from the contemporary wares in nearby areas such as Paracas. Geographic variation is carefully considered both between and within single phases, as collections are used from sites from the Cañete valley south to the Ica valley, and from sites of different functions. Wallace goes on to integrate his ordered ceramic data with observations on associated changes in textiles, adobe brick sequences, and settlement patterns.

The data on Topará settlements show several interesting patterns. Wallace finds that temple mounds with little or no associated occupational debris are

locationally segregated from habitation centers. This town-ceremonial center pattern is common on the south coast during the Early Intermediate Period and was first recognized by Strong in his interpretation of the occupational record of Cahuachi. The best data on the ceremonial centers is from the Chincha valley, where nine mounds are recorded, all aligned perpendicularly to the ocean. The mounds are constructed of solid fill and consist of linearly aligned, stepped structures. This site type and construction technique were Early Horizon innovations on the south coast. The habitation centers are large, agglutinated villages recorded from Cañete and Pisco. In the case of Quebrada (Cañete) and Chongos (Pisco), these village sites have aligned structures. The southern expansion of the Topará tradition coincides with the construction of fortified village sites in the Ica valley.

Wallace concludes by suggesting that the one-sided nature of the southern expansion of the Topará tradition may be the result of state-level organization. If future investigations follow the questions posed by Wallace in his summary and incorporate the same breadth of data, we may be able to grapple with these kinds of issues in the future.

The paper by Richard Daggett presents a synthesis of fieldwork carried out on the north-central coast. The new field data are incorporated into a re-consideration of the traditional model of Early Intermediate Period political unity. Daggett reviews the earlier work of Tello, Schaedel, Collier and Thompson, Proulx's and his own survey data from Nepeña, and recent work by Fung and Williams, Wilson, Pozorski, and Bonavia. He outlines the historical scarcity of research in this region and the kinds of evidence available to test the model of political unification. The absence of Moche influence in the Casma, Huarmey, and upper Nepeña valleys suggests that the north-central coast was outside the area of Moche-based political unity. In contrast to the horizontal or coastal unification, Daggett finds evidence for vertical or coastal-highland interactions in the upper Nepeña valley sites. This pattern is also supported by the distribution of Recuay sites in the Santa valley recorded by Wilson and the broad similarities in artifact assemblages between central coast and north highland sites during the early Early Intermediate Period. Daggett suggests a marked upper valley Recuay occupation of the entire north-central coast during the Early Intermediate Period.

Daggett concludes that a distinct change in settlement patterns took place during the Early Intermediate Period on the north-central coast, distinct from the contemporary patterns recorded for the north and central coasts. The early Early Intermediate Period of the Nepeña valley is characterized by dispersed settlements in the upper valley, and the late Early Intermediate Period by the construction of large adobe pyramids in the lower valley. Supportive data from adjacent north-central coast valleys suggest that the traditional Early Intermediate Period model of horizontal unity may be replaced by a vertically oriented model characterized by dispersed, low visibility settlements.

Material culture studies are integral to the ideas of testing traditional assumptions in archaeology, particularly when advanced analytical techniques are used. Stuart Arnold's work on metallurgical casting techniques in the Andes is based on metallographic examination of polished and etched cross-sections of bronze bola weights and spindle whorls. He suggests that both objects are examples of investment molding, or the molding of interior space to serve a specific function. Cross-sections of the bola weights reveal an interior

transverse bar which is cast as part of the bola weight body. This bar provides a means of cord attachment to the weight and is one of many alternatives to serve this function. Arnold suggests that the investment molded transverse bar was selected based on cultural standards of design efficiency and may have been restricted in usage. The spindle whorl axial cross-sections reveal a complex internal contour that serves as an interior support and as a means of clamping the whorl to the spindle. If correctly interpreted, these results document a new technique for the manufacture of spindle whorls, one that is radically different from the previously reported punch and hammer technique. It is not known if investment molding was restricted in usage to certain kinds of whorls, spindles, functions, time periods, or geographical regions.

The results of both spindle whorl and bola weight analyses indicate the inherent shortcomings of material studies guided only by assumptions of labor efficiency, rather than by sensitivity to relative cultural values. Arnold concludes that the complex casting technique used on the objects he analyzed may be a reflection of the high value of cloth in Andean cultures or simply a technique that was restricted in usage to certain classes of spindle whorls and bola weights.

Two papers (Kaplan/Bonnier, Chiswell) deal with ethnobotanical research, specifically phytolith analysis. Phytoliths, or biogenic opals, are particularly common in grasses, so phytolith analysis is expected to be especially useful for sites located in the **puna** and other high altitude biozones dominated by grasses. As the technique is new in the Andes, results thus far are limited but intriguing. At the site of Piruro (Preceramic Period-Early Formative Period and Late Intermediate Period), at 3800 meters above sea level in Huanuco Department, Peru, Lawrence Kaplan and Elizabeth Bonnier found differences in the phytolith content of surface control and prehistoric sediment samples, as well as variations in the percent composition of phytolith types in different parts of the site. With further study, they hope to be able to distinguish activity areas within the site and to differentiate sterile fill from cultural matrix on the basis of phytolith composition. The authors also signal a potential problem for high altitude sites: the ubiquity of grasses in the puna zone may lead to uniform deposition of phytoliths in cultural and non-cultural sediments. Nevertheless, although substantive results to date are few, Kaplan and Bonnier point the way to the potentially important data that phytoliths can generate. They also include an appendix detailing the method of sample preparation so that non-specialists can gather phytolith data for future analyses.

Coreen Chiswell's paper presents a problem-oriented application of phytolith analysis. Her ultimate objective is to identify storage in Middle Horizon sites in the Huamachuco region of northern Peru, especially at Marcahuamachuco, a large site conspicuous for its apparent lack of storage facilities despite its distance from agricultural land. In order to provide a model of how storage might be reflected in phytolith samples, Chiswell excavated, floated, and studied the contents of Late Horizon **qollqas** in the Huamachuco area. Qollqas are structures known from ethnohistoric sources to have been used for storage; two types are present in Chiswell's study zone, and she hypothesized that the different forms reflect different stored contents. Macrobotanical analysis suggested that maize and tubers were the principal contents of the contrasting qollqa types. Phytolith samples were collected from modern specimens of 35 plant species or plant parts likely to have been stored in qollqas, and using only short-celled phytoliths, four species (all grasses, including maize) could be

distinguished. Analysis of sediments from the qollqas supported to some degree the results of macrobotanical and architectural differentiation of the maize vs. tuber storage contents of the two types of storage structure. Chiswell suggests that further research, including greater numbers of modern comparative specimens and the use of phytoliths other than the short-celled variety, may well increase the precision of the results and allow the identification of storage facilities and their contents in sites such as Marcahuamachuco.

John Topic's paper also concerns the Huamachuco area, but focuses on a particular type of monumental architecture, the niched hall. Topic identifies a local tradition of long, narrow buildings beginning in the Early Horizon or earlier and continuing through the Middle Horizon. A high degree of synchronic and diachronic continuity make temporal seriation difficult, but attribute analysis allowed Topic to differentiate between Early, Transitional, Classic, and Late groups at two sites, Marcahuamachuco and Viracochapampa. This sequence spans the period from about 400 A.D. to 800 A.D. or later. Topic suggests that niched halls spread from Huamachuco to Pikillacta in Cuzco during the Middle Horizon, and that the Inka structures known as **kallanka** were derived from the Pikillacta version of the niched hall and thus ultimately from the Huamachuco architectural tradition.

Patricia Netherly and Tom Dillehay identify dual patterning in Andean archaeological sites in the Chillon and Zaña valleys of the Peruvian coast and suggest that this patterning reflects dual division, the basic Andean organizational principle known from ethnographic and ethnohistoric studies. The authors believe that dual opposition was used in the Andes to order relations between different groups across space and to allow potentially competitive groups to share access to spatially restricted resources. According to the Netherly and Dillehay, dual division and the associated concept of **chaupi** (the intermediate) were given concrete, spatial expression in Andean sites through the use of natural features such as streams and manmade features such as walls. The authors have found evidence of possible dual patterning as early as the Middle to Late Preceramic Period at the Cementerio de Nanchoc site in the Zaña valley, and they find further evidence of duality in sites of subsequent periods. These findings suggest to Netherly and Dillehay a continuity in archaeological, ethnohistoric, and ethnographic traditions spanning thousands of years, much like the temporally more restricted continuities that Topic sees for Middle Horizon to Late Horizon architectural traditions.

Similarly, Monica Barnes stresses the continuities of prehispanic traditions in art, architecture, and iconography from pre-Conquest times into the Colonial Period, as seen in the church of San Cristobal at Pampachiri, in Apurimac Department, Peru. The church was built in the late 16th or early 17th century, probably around 1580. Barnes relates the iconography of the main façade of San Cristobal to the drawing by Santa Cruz Pachacuti Yamqui of the main altar at the Coricancha, the main Inka temple in Cuzco. In the same way that Netherly and Dillehay saw the Andean principle of symbolic dual organization of space given concrete expression in prehistoric sites, Barnes sees the abstract cosmology of the Inkas given visual representation at the Coricancha, at Pampachiri, and presumably elsewhere. The concretizing of abstract concepts would appear to be an Andean tradition spanning thousands of years through various conquests and other alterations.

As we noted in the introduction to a previous volume of Northeast Conference papers (Sandweiss and Kvietok 1985: 2), there has been an increasing trend in Andean studies towards the integration of ethnohistoric and archaeological data. Such a merging requires at least an implicit belief in the continuity of traditions through the Prehispanic Periods and into historic time. In the present volume, this belief in continuity has been made explicit by several authors. Changes occurred continually before and after the European invasion of the Andes, and the study of these changes is fascinating in itself. However, the continuities are also important (see J.V. Murra, cited in Rowe 1984: 650), and their identification can provide a set of keys to unlock the Andean past. Indeed, faith in the utility of interaction between ethnohistorians and archaeologists based on strong prehispanic through posthispanic continuity is implicit in the concept of the Northeast Conference on Andean Archaeology and Ethnohistory. It is our hope that this trend towards the investigation of Andean continuities will continue to be as productive as in the present studies.

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WANDERING SHELLFISH: NEW INSIGHTS INTO INTRA-REGIONAL DISTRIBUTION NETWORKS FROM SOUTHEASTERN COASTAL ECUADOR

Patricia J. Netherly
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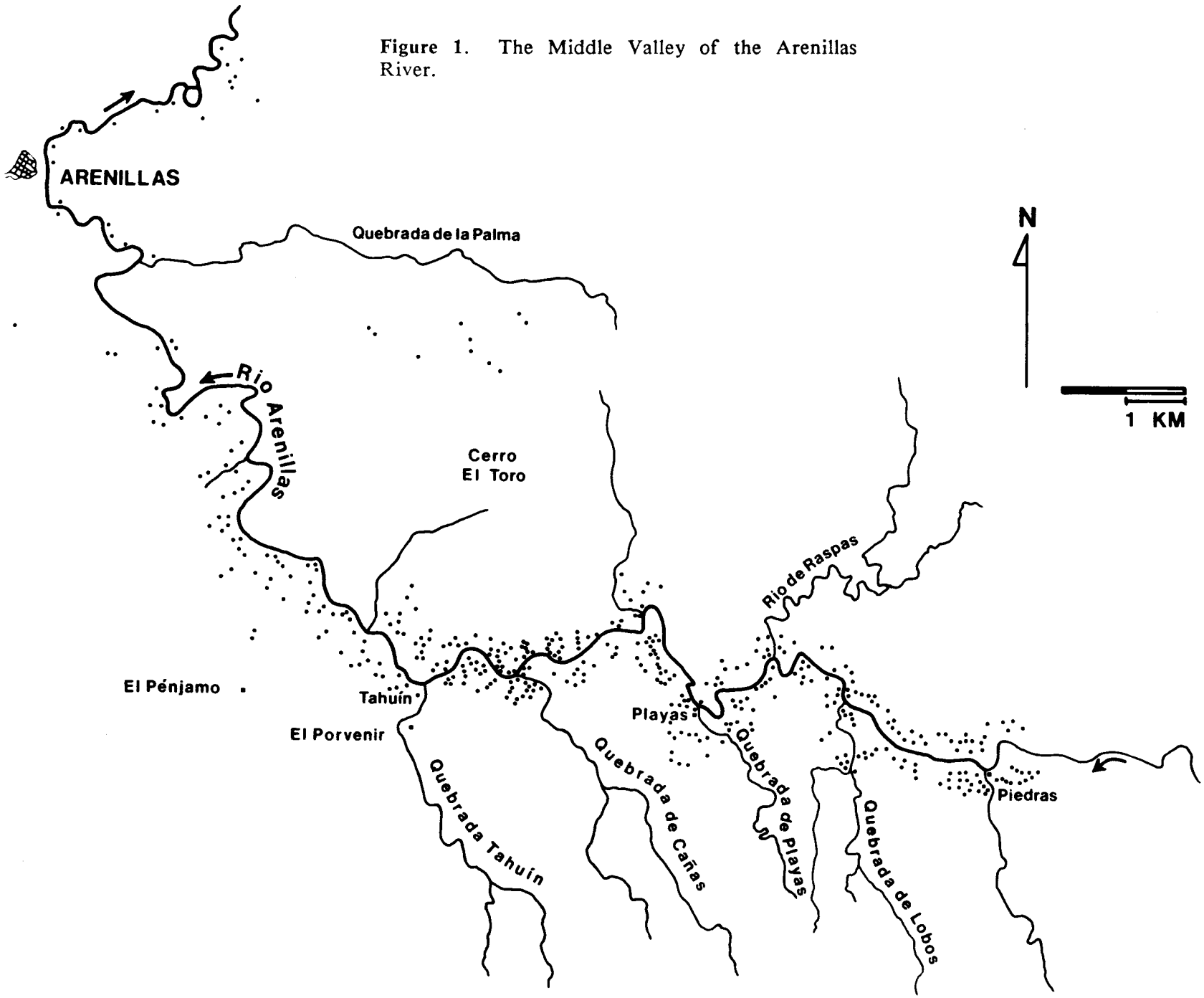
The Tahuin Project is a salvage program of archaeological survey and excavation within the impact area of the Tahuin Dam, which is located in the Middle Arenillas Valley, El Oro Province, in southern Ecuador. The Arenillas Valley lies within 20 km. of the border with Peru, and the Arenillas River empties into the eastern edge of the Gulf of Guayaquil. Research in this area was begun in 1978-1979 under an interagency agreement between the Museums of the Central Bank of Ecuador and PREDESUR, the regional development agency responsible for the construction of the Tahuin Dam.

Prior to the beginning of the Tahuin Project, this region was essentially unknown archaeologically. Estrada, Meggers, and Evans (1964) included four sites from the mangrove littoral of El Oro in their report on Jambelí ceramics. The excavations of the Japanese expeditions in the Tumbes Valley of Peru, some 45 km. to the west, produced evidence for ceramics of a related style, which the Japanese designated Garbanzal, as well as for somewhat earlier periods (Ishida et al. 1960; Izumi and Terada 1966). Some excavations, as yet unreported, have been carried out on shell mounds on the littoral of the Santa Rosa Valley at Garumal by Elizabeth Carter of the Institute of Archaeology, London.

A program of survey and testing carried out during the 1978-1979 season of the Proyecto Arqueológico Tahuin resulted in the location and description of some 525 sites and test excavations at four of these. In September of 1982, it was possible to return to one of the sites, the Romero Site (O-O-Ar-Ar-160), for more extensive testing. The El Niño rains, which began in this region in October, 1982, forced suspension of excavation and closure of the pits in mid-December. The site was inundated and it is problematic whether further work will be possible. The ceramic analysis from this and other sites in the survey area is only just begun and will have to await further excavation before a regional chronology for this little-known area can be established. For this reason, the data presented here are necessarily incomplete and the conclusions tentative.

The Arenillas River empties into the Gulf of Guayaquil through a coastal belt of mangrove. The shoreline of the entire valley fronts on the Jambelí Channel, a series of shallow, winding, interconnected waterways through low, mangrove-covered islands. Only the outer islands front on the open waters of the Gulf itself. The mangrove habitat is home to numerous species of mollusc, particularly *Anadara tuberculosa* or **concha prieta** (Olsson 1961:87-88) and *Anadara grandis* or **pata de mula** (**pata de burro**) (Ibid:93). These species predominate in the shell middens of all periods. The coast in this area has been undergoing a slow process of progradation over the past five or six millenia, so that sites dating to the second millenium BC are now found on the first beach ridge south of the backswamp or **salinas** zone and behind the active mangrove margin. Sites dating to the Jambelí Period (roughly 500 BC to 500 AD) are found on both landward and seaward margins of the backswamp zone and well inland

Figure 1. The Middle Valley of the Arenillas River.



where tidal streams and inlets (**esteros**) offered access to the mangrove channels.

Ecologically, the region in which the Arenillas Valley lies is transitional between the dry valleys to the west and south and the much wetter regions along the coast of Azuay north of Machala. In the Arenillas Valley itself there is a narrow band of desert behind the beach ridges with columnar cactus and grasses, followed by a much broader zone of desert scrub including trees such as **ceibo** and **palo santo**, shading first from dry thorn scrub including algarrobo, deciduous thorny shrubs, and grasses into a tropical dry thorn forest with many tree species including **hualtaco**. As one ascends the western escarpment of the Andes, the forest passes through a number of transitional zones becoming progressively more humid and culminating at ca. 1500 m. in a humid tropical montane forest (monsoon forest).

Unlike the much longer and larger Puyango-Tumbes and Jubones Rivers, the Arenillas heads on the immediate western slopes of the cordillera and exhibits highly seasonal variations in discharge. Rainfall to the north of the city of Arenillas on the coastal plain is only 100-150 mm. per annum and is insufficient to maintain agriculture. Today this area is farmed under irrigation, although floodwater farming and a system of water storage with pot irrigation may have been strategies used in the past. Inland to the south, however, rainfall between December and April is adequate to permit one crop slash-and-burn farming, especially on the low hills. The Middle Valley between Arenillas and Piedras offers relatively little bottomland, although some **playa** areas may have been regularly flooded and others are suitable for irrigation.

There is a perceptible break in slope between the headwater streams--the Rios Piedras and Naranjal--which join at Piedras to form the Arenillas, and the Middle Valley between Piedras and Arenillas (Figure 1). There is an extensive pocket of level bottomland roughly in the center of this area around Playas and closure at the western end at Cerro el Toro, the site of the modern dam. Beyond this point the climate becomes noticeably more arid and the river is entrenched between the hills until it breaks out onto the coastal plain at the city of Arenillas.

The initial research has been carried out with the following hypotheses in mind: 1) that there would be a full sequence of occupation from the Preceramic Period to the arrival of the Europeans; 2) that there would be evidence for the utilization of the diverse ecozones present in the valley, either in the form of colony-settlements or in the form of exchange patterns; 3) that there would be evidence for contact with adjacent highland populations; and 4) that there would be evidence for contact with populations to the east and west along the Gulf of Guayaquil and with those of the Isla de Puná and the Santa Elena Coast to the north.

The methodology employed was conditioned by the salvage nature of the project, which prompted an intensive (100%) survey in the reservoir and reserve area behind the Tahuin Dam in the Middle Arenillas Valley. Shovel tests were necessary at many sites to expose the original occupational surface. Because of the importance of the Lower Valley and the fact that ceramic preservation is better in this drier region, blocks from three stratified transects were randomly sampled. These transects included the banks of the Lower Arenillas River between San Vicente and Jumón; both sides of the road connecting the town of

Arenillas and the port of La Pitahaya in the center of the valley; and either side of an occasional water course on the western edge of the valley called Rio Nuevo.

The data reported here touch on the occupation of the Middle Valley and on the second of the four hypotheses proposed. In the course of time human occupation of the Middle Valley covered all possible topographic locations--hilltops, hillsides, and river terraces. Over 360 sites were located in this area alone. It is hypothesized that this occupation was not simultaneous, and most sites seem to have just one or possibly two components, suggesting frequent relocation of even major settlements and, perhaps, avoidance of previously occupied sites. There is an evident hierarchy of site size, some settlements consisting of only one structure; others are villages, consisting of several structures around a plaza. Not surprisingly, the largest villages are found in the Lower Valley. Structures are of wattle and daub construction and seem to have been regularly burned. Fired daub with cane impressions is most common and post molds are found in the course of excavation. Burial in the Middle Valley appears to have been in hilltop cemeteries. Lower Valley burials are found in low artificial mounds, or **tolas**.

Surprisingly, a number of inland sites, lying between 15 and 45 km. and more from the coast, have extensive shell middens. These sites are all located on river terraces, suggesting transport by canoe rather than by land. This is an important factor since the shell of mature *Anadara* is thick and dense. While a general gradient of more shell in the middens closest to the sea and less in those at a greater distance can be observed, the sites furthest inland have a much higher proportion of shell from immature and hence smaller specimens. The sites in which shell occurs in quantity appear also to be segregated by time period, falling into what I hypothesize to be Early to Middle Jambelí. It should be noted that the game resources of the inland areas included both Virginia and brocket deer, peccary, rodents such as capybara, reptiles, and large snakes, e.g. boas. Freshwater fish were extremely abundant in the Middle Arenillas River until they were literally exterminated by dynamite fishing some twenty years ago. Presumably they were also abundant in the past.

One of the most interesting of these inland sites with middens is the Romero Site (O-O-Ar-Ar-160) (Figure 2). This site is located on the second terrace of the north bank of the Arenillas River at the foot of Cerro El Toro and some 900 m. upstream--around the base of the Cerro--from the modern dam site. It is defined by two small quebradas and the slope of the hill spur behind it and appears to have extended some 160 m. along the river and some 80 m. in from the edge of the terrace. The terrace rises some 6 m. above the river and gently rises some two meters more.

During our survey in 1979, we found a midden area of some 20x30 m. partially exposed on the surface. Two 1x1 meter test pits were placed in this midden. The location of these tests was motivated initially by the fact that preservation of the painted decoration on the ceramics was unusually good in the midden and infinitely superior to the highly eroded surfaces found on sherds from sites elsewhere in the Middle Valley. Since one of our primary objectives was, and still is, the establishment of a regional chronology, a reasonable ceramic sample from this site was desireable. The midden was taken down in arbitrary levels of 4 cm., there being no discernable stratification. A broad band of shell, of some 50 to 70 cm. in width, consisting almost exclusively of

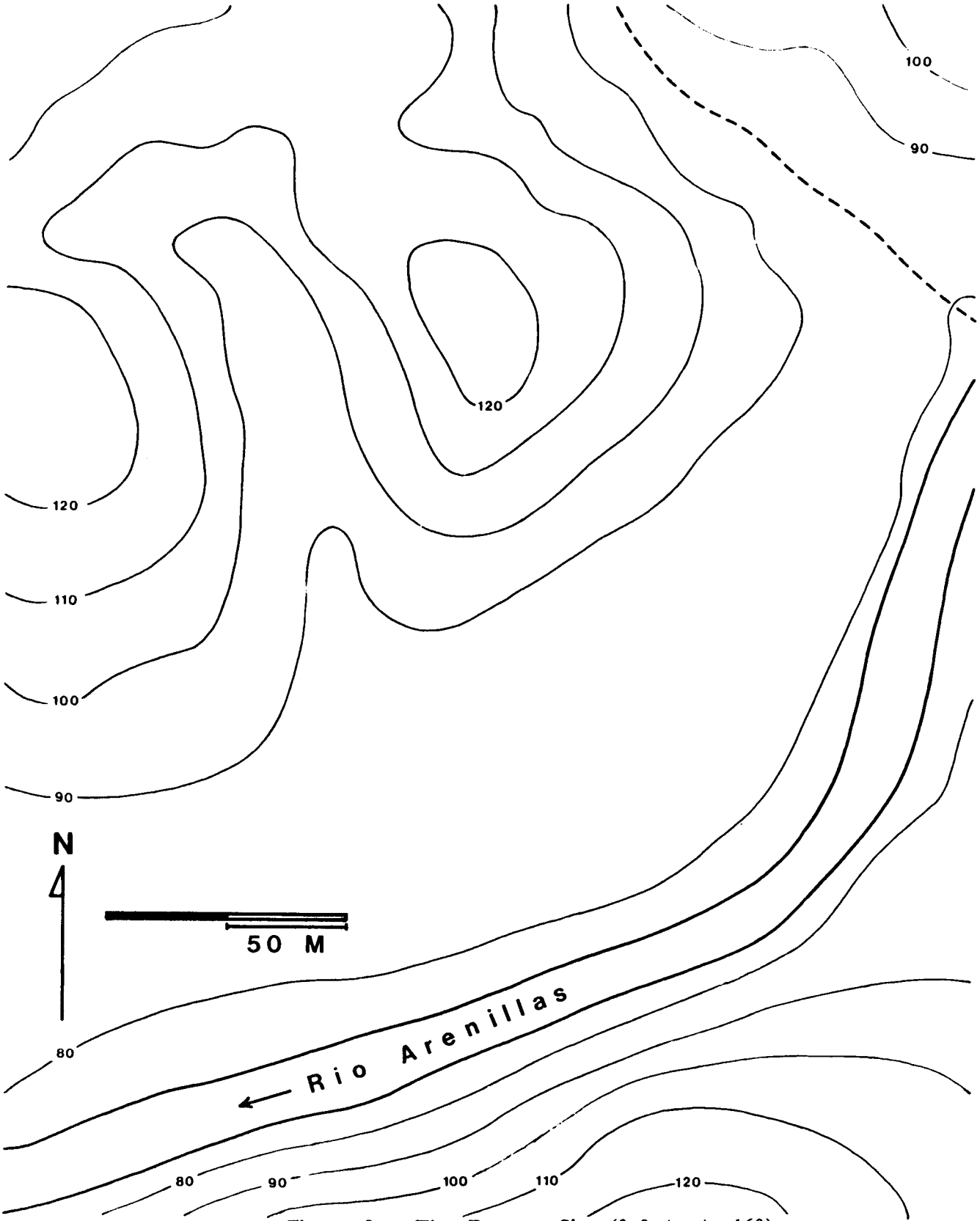


Figure 2. The Romero Site (0-0-Ar-Ar-160) largely occupies the lower terrace between the two small quadrangles that define the hill.

immature *A. tuberculosa*, dominated the midden. In the course of excavation, large bones were encountered and recognized; some were obviously mammalian and others appeared to be quite large fish vertebrae, presumably from marine species. They were certainly too large for any fish likely to be found more than 55 km. from the mouth of a river with such seasonal fluctuations in discharge as the Arenillas. Riverine species of fish today are all relatively small.

A 4% sample of midden from each level was floated and yielded large quantities of small bone, mostly of fish and shark. Approximately three-fourths of this material has been analyzed under the supervision of Dr. Elizabeth Wing of the Florida State Museum. Since tabulation is not complete, I have not performed any statistical operations with these data. However, simple tabulation offers some very interesting results. Of mammal bone there was surprising little. There is evidence for the following:

1 dog
1 unidentified carnivore
1 Virginia deer
1 cervid
1 medium-sized mammal
2 rodents

Among the birds there was bone from:

1 gull or tern (*Laridae*)
1 vulture (*Catharridae*)
1 unidentified bird

The explosion occurs when we get to the fishes. Cartilagenous fish were represented by a total of seven individuals:

1 tiger shark (*Galeocerdo cuvieri*)
2 sharks (*Carcharhinidae*), which can attain a length of 2 m.
1 shark (*Mustellus* sp.)
1 shovelhead shark (*Sphyrna tiburo*)
1 ray (*Rajiformes*)

All of these species can be found inshore in shallow coastal waters or estuaries.

The bony fishes were of even greater interest. There was a total of 31 individuals which could be identified as catfish:

2 *Arius* sp.
8 *Bagre panamensis*
10 *Bagre* sp.
11 *Ariidae*

The following other bony fish species were also represented:

1 toadfish (*Batrachoides pacificus*)
2 grouper (*Epinephalus* sp.)
2 sandfish (*Serranidae*)

3 jack or scad (*Carangidae*)
1 grunt (*Haemulon*)
2 sea bass (*Cynoscion*)
1 *Sciaenidae*
1 mullet (*Mugil* sp.)
1 pufferfish (*Sphaeroides* sp.)
35 unidentified fish

This makes a total of 80 individual bony fishes.

It would be premature to assay a final interpretation of this material. However, there are a number of observations that can be made. The tests made in 1982 in the area to the west of the midden tend to confirm my earlier suspicion that this is not an everyday "normal" domestic midden for this time period in the Middle Valley. The pottery is one indicator of the unusual nature of the midden. Sherds from storage vessels are conspicuous by their absence and fragments of large cooking pots are rare. What abound are small and medium-sized decorated bowls and plates, i.e. fancy serving dishes (cf. Izumi and Terada 1960; Estrada, Evans, and Meggers 1964). In the area to the west there were at least two structures around which the proportion of fancy ware and small cooking vessels was very high. A radiocarbon assay on large mammal bone from the midden gave a date of 1880±70 BP, or 70 AD. If anything, this date is young (Tamers and Pearson 1965). It will be supplemented by carbon dates on charcoal recovered in the 1982 excavations. In the meantime, it provides a time frame for this particular assemblage.

The faunal assemblage which has been analyzed to date is disproportionately skewed toward large fish and young shellfish, which were presumably easier to haul around. These species must have been collected from the estuary, the mangrove zone, and, perhaps but not necessarily, the open Gulf outside the islands. While one can assume that some of the unidentified bony fish may be fluvial, the small number of inland species compared to the large number of species and many individuals of marine and estuarine fish leads me to suggest that this midden represents an extraordinary event or events in the life of this community, rather than ordinary patterns of subsistence (cf. Wing 1977). The only remotely comparable material comes from Loma Alta, a much earlier site some 15 km. inland from the mouth of the Valdivia River, where a more limited array of fish species was found (Byrd 1976). Shell is present in small quantities on a number of Middle Valley sites, but middens such as the one described here are very rare in the Middle Valley.

The Romero Site is strategically located and large enough to have controlled a substantial sector of the Middle Valley. While one midden does not an inter-regional polity make, the observed segregation by time and location of sites with such middens suggests a socio-political explanation for the uneven distribution of edible mollusc and fish remains on inland sites. It is suggested that the extensive circulation of shellfish and presumably dried or salted species of marine fish represents an episode of greater socio-economic and perhaps political cohesion, reminiscent of that found by Coe and Flannery at Ocos (1967). The failure of this pattern to persist over time most probably reflects changes in socio-political organization, since economic and nutritional protein needs were not an over-riding factor.

Acknowledgements

The faunal identifications were made by Dr. Elizabeth Wing of the Florida State Museum and by Stephen Hale working under her supervision. The floristic study of the Arenillas region was carried out by Dr. Linda Albert de Escobar of the Universidad de Antioquía in Medillín, Colombia. In my attempts to come to preliminary terms with the regional ceramics, I have benefitted from discussions with Olaf Holm, Director of the Museo Antropológico of the Banco Central del Ecuador in Guayaquil; Dr. Jorge G. Marcos of the Escuela Superior Politécnica del Litoral in Guayaquil; and Dr. James B. Richardson III of the Carnegie Museum, Pittsburgh. An earlier version of this paper was read at the 48th Annual Meeting of the Society for American Archaeology held in Pittsburgh in May, 1983.

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LATE PREHISPANIC TERRACING AT CHIJRA IN THE COLCA VALLEY, PERU: PRELIMINARY REPORT I

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Introduction

This report presents the results of the first field season of an interdisciplinary project which is studying the cultural ecology of terracing and terrace abandonment in the Colca valley of Southern Peru. Terraces are widely distributed throughout the Andes and play an important role in the agriculture of many highland valleys, where level ground is at a premium. In this context, it is worth noting that more terraces are abandoned than are presently in use: Denevan (n.d.) estimates that about 60% of all terraces in the Peruvian Andes are now abandoned. This suggests that there have been fairly substantial demographic and/or ecological changes that have influenced terrace use in the past. The identification of the factors responsible for these changes is the principle goal of the Colca Valley Abandoned Terrace Project, a collaborative effort involving American and Peruvian geographers, archaeologists, ethnohistorians, and soil scientists. The principal investigator of the project is Dr. William Denevan of the Geography Department at the University of Wisconsin-Madison.

Background

The Colca valley is located northwest of the city of Arequipa in the district of Caylloma, Department of Arequipa, Peru. The main sector of dense terracing is the 50 km. long middle portion between the villages of Chivay, 3633 m. above sea level, and Cabana Conde, at 3287 m. (Denevan n.d.) (Figure 1). Just above Cabana Conde, the Colca river plunges into a deep canyon and later becomes the Majes and then the Camaná before it empties into the Pacific Ocean.

Upon entering the central portion of the Colca valley, one is immediately struck by the quantity of terraces. Upon further observation, it can be seen that a considerable number of the terraces are now abandoned. The process of abandonment appears to have started at the uppermost terraces and proceeded downward: the highest terraces in any given area are now abandoned, while those further down on the slopes and on the river terrace are still in use. One can also clearly distinguish abandoned irrigation canals that once fed the upper terraces. The common response by local farmers to the question of why the upper terraces are not used today is a lack of water.

Ethnohistory

Prior to the Spanish Conquest, this region was occupied by the Collaguas and the Cavanas, who were ethnically distinct from the other groups living 3 around them (Ulloa Mogollón 1965). The exact nature of the distinction between these two groups is uncertain (Pease 1977:140). The Cavanas, or

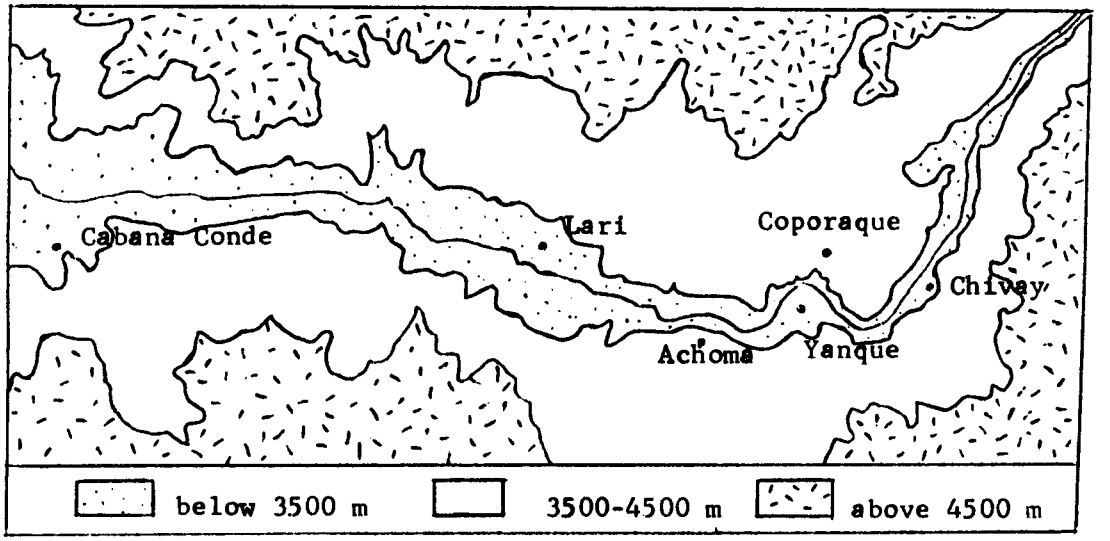


Figure 1. Map of the central Colca valley (from Cook 1982).

Cabanas, who occupied the more temperate zone around Cabana Conde, spoke Quechua, although very crudely. By tradition, they came from Hualca Hualca, a local volcano, and bound their heads to produce a low, wide skull (Ulloa Mogollón 1965:327). The Collagua, who occupied the central and upper section of the Colca basin, spoke Aymara, came from Collaguata, a different volcano, and deformed their heads in a different way (Ibid). Each had distinctive headdresses as well. Both groups are said to have descended from their respective places of origin and conquered and displaced the local inhabitants of the area.

In addition to the Cabanas and Collaguas, there may have been other ethnic groups in the area. Ulloa Mogollón mentions that the towns located at the boundary between the Cabanas and Collaguas spoke different and separate languages, "very barbarous" and mutually unintelligible, although related. He also mentions towns in the region of Cabana Conde whose inhabitants spoke different languages (Ibid:329). Whether these other languages represented cultural remnants of the original occupants of the valley, were the languages of Incaic **mitmaq** from other regions, or were local dialects of Aymara and Quechua is an interesting question, but one that is beyond the scope of this paper.

The Collagua were further subdivided into two groups, the Yanqui-Collagua, who resided on the south side of the river in the region around Yanqui (now Yanque), and the Lare-Collagua, who resided on the north side, around the town of Lari (now Lare). Oral tradition has it that both towns were founded by the original migrants from Collaguata, Lari being founded by the uncles and nephews of the founders of Yanque (Ulloa Mogollón 1965).

Not only were Yanque, Lare, and Cabana Conde important towns of the Collaguas Province, they also controlled access to resources in other areas, both to the west and the east (Málaga 1977:111). Collagua **mitmaqs** are mentioned as having existed in the Majes, Camaná, Vitor, and Sihuas valleys, as well as in Arequipa (Ibid:112). Collaguas groups had access to **lomas** and coastal resources, rights which survived even into the present: the herding town of Sibayo, in the upper Colca valley, still has access to a coastal region around Punta Coloca (Cuadros 1977:48). Yanque also had jurisdiction over pasture lands in the Collao of the Altiplano and maintained trading relations with other **puna** communities (Ibid:119).

As Pease notes, groups in the Colca valley had access not only to different ecological zones within the valley, in accordance with Murra's (1972) verticality model, but also resource zones in other areas (Pease 1977:144). For our purposes, it is worth noting Pease's comment that all the evidence points to strong links between the Collaguas region and the Altiplano of Titicaca (Ibid:1-57).

It is not clear from ethnohistoric or archaeological sources when the Incas conquered the Colca valley, or what changes they wrought in the existing social structure. Some ethnohistorical sources state that Mayta Inca married the daughter of a Coporaque **curaca** and constructed a house of copper in which to reside when visiting (Málaga 1977:100). However, Pease (1977:141) notes that these sources are dubious, and suggests that the Mayta Inca mentioned was probably the chief of the Mayta Inca **panaka** (an Inca social unit) in the Colca region, and hence was mistaken through time as *the* Mayta Inca. It is more likely that the Colca region was incorporated into the Inca empire during the conquest of Contisuyu by Topa Inca Yupanqui after 1476.

Evidence for a strong Inca presence in the central Colca valley is lacking, insofar as no administrative center has been positively identified, and even the ceramics characteristic of the Cuzqueño Inca are relatively rare. On ecological grounds, Pease (1977:159) suggests that the Incas may have concentrated their efforts in the vicinity of Cabana Conde, since it was more conducive to growing maize. However, the Inca presence may have taken a different form in this region than is typical for other areas, thus accounting for its apparent absence.

After the Spanish Conquest, the Collaguas region was given as **encomiendas** to several **conquistadores** (Málaga 1977:96). It is interesting to note that Gonzalo Pizarro was given the region around Yanque, due to its known agricultural and livestock riches. Between 1571 and 1574, Viceroy Toledo enacted his **reduccion** policy of concentrating the indigenous population in a few central towns. This policy was strongly resisted by the inhabitants of the Colca valley, who previously had lived in dispersed settlements (Ulloa Mogollón 1965:328).

The central sector of the Colca valley remained the most important part of Collaguas Province until 1626, when rich mineral deposits were discovered in Caylloma (Málaga 1977:110). The valley witnessed a rather substantial population decline during the early Spanish period which, together with the Spanish **reducción** policy, destroyed much of the indigenous social structure (Cook 1982). The Colca region then slipped into anonymity before being "rediscovered" in the early decades of this century (Shippee 1932, 1934).

In summary, the Collaguas region was the richest and most densely populated **corregimiento** under Arequipa's jurisdiction in the sixteenth century (Málaga 1977:98). The Collagua not only controlled the rich agricultural core of the Colca valley, but also had economic ties to both coastal and Altiplano groups. In addition, the valley was (and still is) on a major llama caravan route between Cuzco and Yauli in the highlands and the southern Peruvian coastal valleys. The fact that the Collagua spoke Aymara suggests that they came from the Altiplano, a suggestion supported by the strong ties to that region that are still in effect today. The Collagua apparently were strong enough to maintain their ethnic identity even after the Inca conquest of the valley.

Archaeology

Almost no archaeological work has been done in the Colca valley, and the two studies undertaken were both preliminary surveys (Linares 1981; Neira 1961). Neira identified most of the large village sites in the Colca valley and provided a tentative description of the major ceramic types present. The Chuquibamba series, originally described by Kroeber (1944), was the most common, and Neira associated it with the Collagua occupation of the valley. These ceramics typically consist of black painted designs on a red slip. Less frequently, white paint is also used. Characteristic designs are wavy lines, cross-hatched rhomboids, and stylized animals. Bowls with round bottoms and straight to convex sides are the most common forms (Lumbreras 1974:213; Neira 1961).

Chuquibamba pottery appears to be closely related to Churajón wares of the Arequipa region, as well as to Collao and Allita Amaya ceramics from the Altiplano. They certainly would fit within the range of types characteristic of

the Southern Tricolor Horizon (Lumbreras and Amat 1968). On this basis, the Chuquibamba series is considered to pertain to the Late Intermediate Period.

Few ceramic period occupations dating prior to the Late Intermediate Period have been identified in the Colca valley as yet, although some preceramic sites are known. This is almost certainly due to the lack of archaeological work in this region, rather than an actual hiatus in its occupational history: Vera Cruz (1985) has identified a Wari site and possibly an earlier site as well in the vicinity of Cabana Conde.

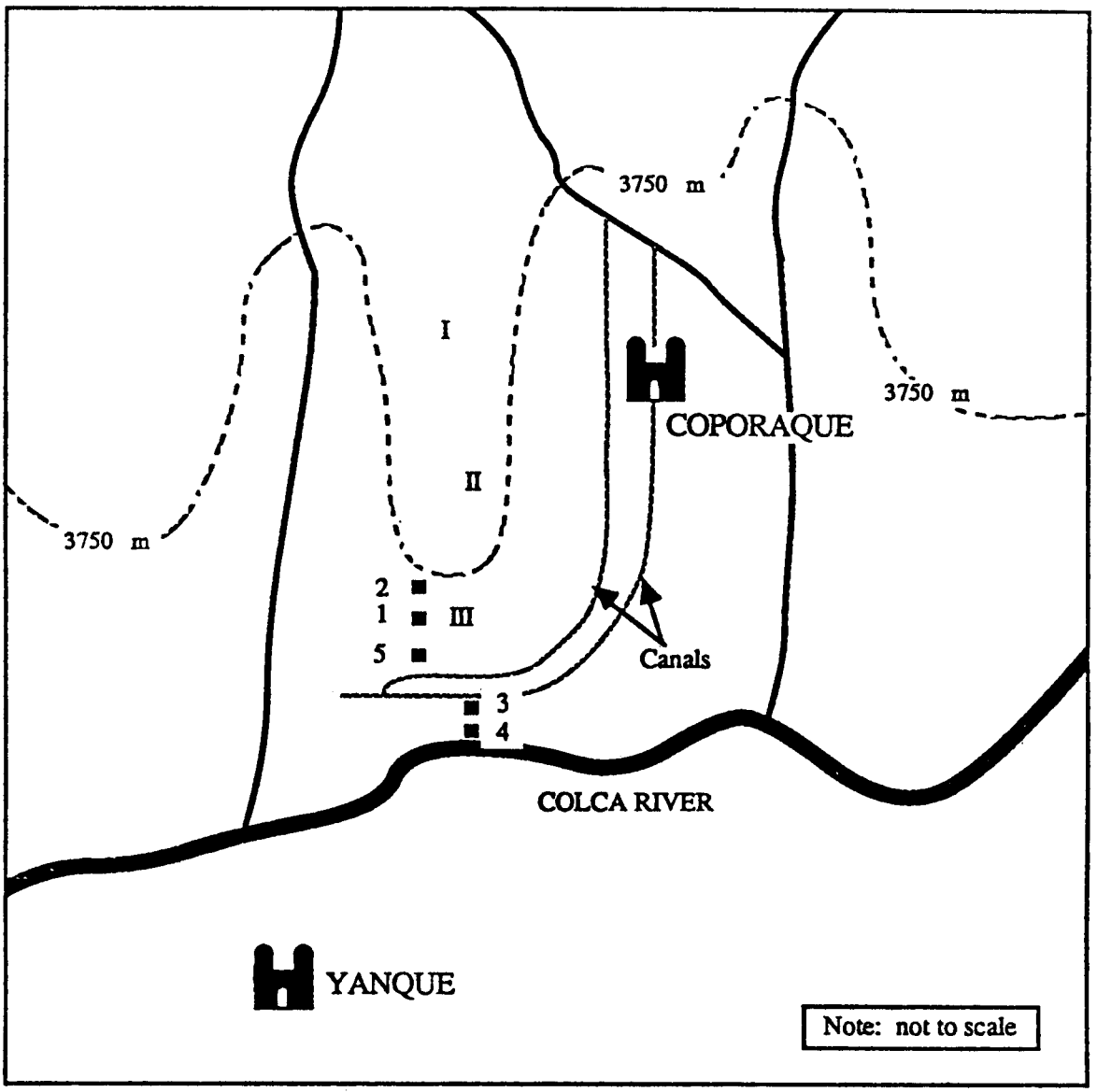
As mentioned earlier, the exact nature of the Inca presence in the Colca valley is poorly understood. Part of this stems from the relative scarcity of Cuzqueño pottery types in the valley. However, it is possible that some of the Chuquibamba types pertain to the Inca period: Lumbreras and Amat (1968:93) mention that the Chuquito Black-on-Red pottery of the Puno zone is clearly Inca-related, although it developed from earlier, indigenous forms. Thus, the lack of Inca ceramics is probably due to our present inability to distinguish indigenous wares from Inca-influenced ones.

It may also be possible to distinguish Collagua and Inca occupations by variations in architectural styles. Neira (1961) describes a typical Collagua house as being roughly rectangular with a gabled roof and constructed of field stones. The identifying characteristics of the houses are their tall, very narrow doors, measuring 2.5 m. high but only .5 m. wide, and their carefully worked cornerstones, most of which have been removed to construct houses in the modern villages (Ibid:97-98). In contrast, the few Inca structures identified have the characteristic trapezoidal doors and niches and carefully fitted stonework over the entire building. Circular **colcas** (Inca storehouses) are also known from Achoma (Shea n.d.) and a site near Coporaque.

Fieldwork

The specific archaeological objectives of the project were to determine, if possible, the date of construction and abandonment of a sample of the Colca valley terraces. Toward this end, test excavations were made in agricultural terraces (by Malpass and Vera Cruz) and in an associated occupation site (by Neira). The area selected was the ridge located on the north side of the river and east of the town of Coporaque. This ridge descends from **Yurac Ccacca**, a prominent peak due west of Coporaque, and terminates where it has been cut through by the Colca river (Figure 2). It has steep flanks but a relatively flat summit. Two main irrigation canals provide water from the quebrada east of the ridge to the eastern flank and front slope. All of the terraces currently in use are watered by these two canals. In addition, there are a substantial number of abandoned terraces above these canals, which were formerly irrigated by a canal which flowed down the summit of the ridge. The terraces above the two main canals, which are all abandoned and in a good-to-poor state of preservation, will be referred to in the remainder of this paper as the "upper terraces". The terraces below the main canals, which are mostly still in use, will be referred to as the "lower terraces".

Investigations were concentrated in a geographically distinct area of abandoned terracing and houses called **Chijra**. This area included nine house located among about thirty abandoned terraces. Neira excavated one of the



I. Yurac Ccacca ridge
II. Chilacota
III. Chijra

■ Terrace Trenches

Modern Towns

Figure 2. Coporaque study area.

houses located near the principal feeder canal which brought water from the main irrigation canal near the summit of the ridge.

Five terraces were selected for trenching (Figure 2). These were located at irregular intervals from the level of the river (3270 m.) up the south-facing slope of the ridge to an elevation of about 3650 meters. The bottom two were located in the lower terraces, while the top three were in **Chijra**, one very close to the house where Neira was excavating. Additional test excavations were made at **Chilacota**, a possible occupation site and associated terraces just below **Yurac Ccacca**, at an elevation of about 3750 meters.

Because of the brevity of the field season, only limited testing was possible. Neira excavated a two meter square pit in the northwest corner of the interior of an abandoned house and cleared the outer foundation on the north, east, and south sides. All materials were sifted through a .5 inch mesh screen. The five terraces were trenched from the base of the rear wall to the front retaining wall, using a one meter wide trench. Excavations were continued until either bedrock or a sterile soil horizon was encountered. All soil was sifted through a .5 inch mesh screen.

Excavation techniques varied from terrace to terrace. Terrace 1, located in **Chijra** adjacent to Neira's excavations at 3605 m., was excavated in arbitrary, 15 cm. levels until a buried wall foundation from an earlier terrace was encountered. Subsequent excavations continued utilizing levels defined in terms of the wall. While natural strata were identified after the trench had been excavated, they were not apparent during the excavation and therefore were not utilized.

Trenches 2 and 5 were also located in **Chijra**, the former above Trench 1, the latter below it. These trenches were excavated using arbitrary, 10 cm. levels. Trenches 3 and 4, located in the lower terraces, had a .5 m. wide test trench opened first, using 15 cm. arbitrary levels, to expose the soil profile. A second .5 m. wide trench was then excavated, using the existing profile as a guide to the natural stratigraphy.

The test excavations in **Chilacota** were conducted by Debbie Martin, a graduate assistant to Malpass. She excavated seven test pits of sizes 1x1 or 1x2 meters, in both the terraces and the suspected habitation areas (Martin n.d.). She used arbitrary levels of either 10 or 15 centimeters. All materials were sifted through a .25 inch mesh screen.

Soils from the profiles were collected by Jon Sandor and are being analyzed at Iowa State University. Radiocarbon dates are being analyzed at the University of Wisconsin-Madison.

Results and Interpretations

The discovery of a buried wall foundation in Trench 1 provided important information concerning the occupational history of the area. The profile of this trench is shown in Figure 3. Three features merit some description and explanation. The first is the large block of brown soil located to the rear of the trench and designated Feature 1. This block was both a different color and texture from the surrounding matrix, although its presence was only noted after

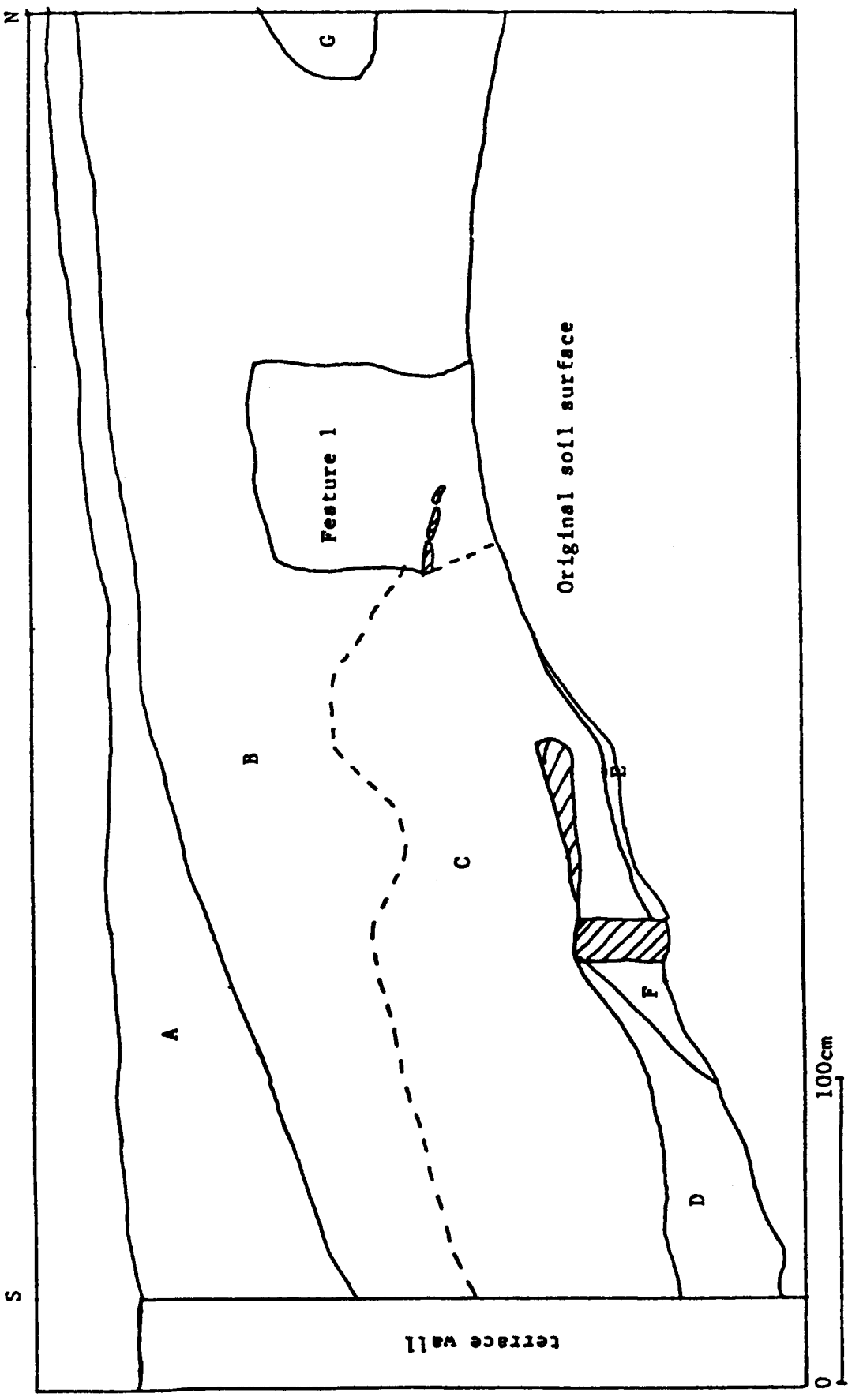


Figure 3. Trench I: West wall profile.

a rare (and fortuitous) rainfall. This block apparently is part of some sort of low wall, as it was found in the corresponding location in the opposite wall profile. More irregularly-shaped inclusions of similar soil were found at the rear of the trench (Stratum G). While it is conceivable that this feature only represents fill for the terrace brought in from a different area than the remaining fill, its rectangular shape suggests a retaining wall function. The rubble from the earlier of two terrace walls described below is piled against Feature 1, suggesting that it is earlier than the two walls.

The second feature in Trench 1 has been interpreted as the remains of an earlier terrace wall that was probably deliberately destroyed but may have fallen down naturally. This earlier wall is represented by Stratum C, a layer of stone rubble. The existing terrace was then constructed, incorporating the stones from the earlier wall as fill. The constructional sequence has been reconstructed as follows.

After Feature 1 was constructed, the earlier terrace wall was built and soil was brought in, or allowed to accumulate behind it, creating the rear part of Stratum B. Some soil washed over and through the wall to accumulate down-slope, creating Stratum D. Presumably, this terrace was then used for some time.

The earlier terrace apparently was constructed at about the same time as the house located two meters to the east, as it is in line with the side wall of the house. This fact indicates that the house, and by extension the other houses nearby, were constructed *prior* to the construction of the existing terraces in **Chijra**. How much earlier awaits analysis of the radiocarbon samples collected during excavations.

Sometime after the early wall was constructed, the present terrace wall was built, and the earlier one either fell down or was deliberately thrown down, creating Stratum C. It seems more likely that its destruction was a deliberate act, since the stones are lying against the later (present) wall. The fill for the earlier terrace then washed over the rubble of the wall, or was thrown in, accounting for the steeper slope of Stratum B. Finally, additional fill was brought in to bring the terrace to the desired height and degree of flatness, accounting for Stratum A.

It is worth commenting here on the origins of the terrace fill. David Guillet (personal communication) notes that modern terraces at Lare are constructed using fill collected from the area of the terrace, because it is land owned by the terrace owner. If insufficient soil is available, it is brought in from elsewhere. Cook (1916:496) states that Inca terraces along the Urubamba were constructed in this manner, with fill brought from elsewhere. However, he also notes that occasionally modern farmers construct a wall and allow it to fill up with slopewash during the rainy season. Thus, it is conceivable that the artifactual contents of terrace fill are of origins completely external to the terrace itself.

The third feature found during the excavation of Trench 1 was a stone-lined canal, located along the base of the earlier terrace wall (Figure 4). Examples of canals in the same locations relative to terrace walls can be found in **Chijra** today, although the slightly arcuate shape of this feature is unusual. It was composed of flat stones placed upright in the natural hillslope, one of which

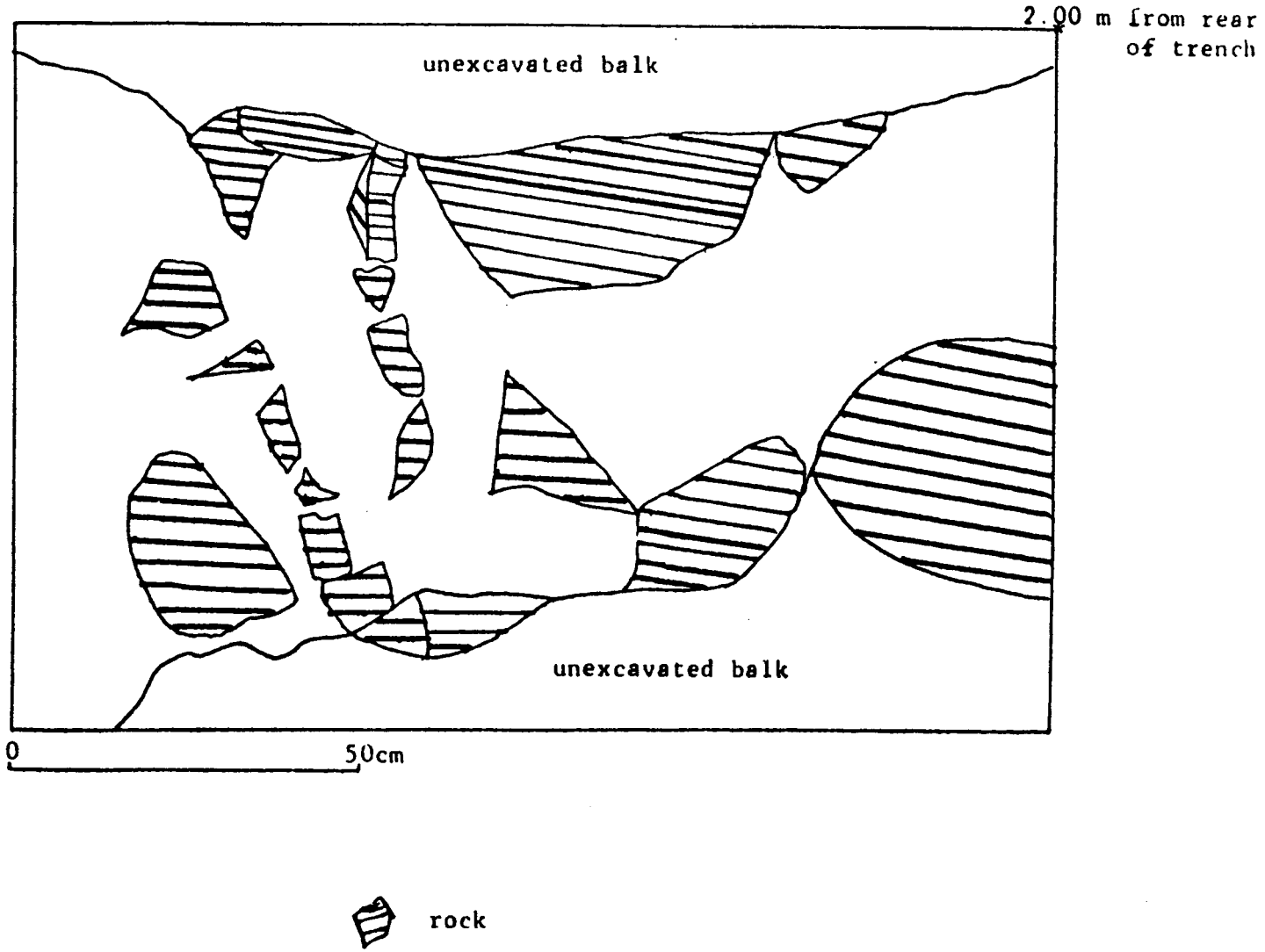


Figure 4. Trench I: Plan view of buried wall foundation and canal at 160 cm. below datum.

can be seen in profile in Figure 3. If it was an irrigation canal, it presupposes the presence of a terrace contemporaneous with, but downslope of, the earlier terrace in Trench 1. The only evidence for such a terrace is the relatively flat surface of Stratum D, which suggests that it was impounded behind an obstruction lower down the slope. It is possible that the supposed earlier terrace was destroyed during the construction of the present terrace system. Further excavations in the lower terrace could confirm or deny this hypothesis.

The evidence from Trench 1 does suggest that there have been at least two phases of construction in the abandoned terraces of **Chijra**. The first, represented by the buried wall foundation, probably dates to the period of construction and use of the nearby houses. Subsequently, the terraces were rebuilt, and probably expanded, to their present configuration. Whether the houses were still used during this second phase of construction is unknown: the door sill and the foundation of the house excavated by Neira are well below the present terrace surface, but it is conceivable that this is due to soil buildup subsequent to the terraces' abandonment.

A considerable quantity of ceramics, lithics, and animal bone was recovered from the excavations near Coporaque. Unfortunately, little could be analyzed prior to the end of the 1984 field season. Results to be presented here, then, are restricted to trends seen in the rough sort of the ceramics, and to further observations on the relative ages of the terraces and irrigation systems.

The ceramics can be divided into two general groups, decorated and undecorated wares. The majority of the decorated wares include pottery with painted designs, virtually all being the Black-on-Red or Black-and-White-on-Red types of the Chuquibamba series. These, for the most part, include animal or geometric designs. Forms include ollas and straight-sided bowls. A second group of decorated pottery had no designs, but included a zone of red slip applied over the generally orange paste. The red slip was restricted to the interior and exterior of the rim, extending down either side a variable distance. Undecorated wares were usually scraped on the exterior and/or interior and sometimes were smoothed as well. No forms have been identified yet, except for a flat-based, narrow-necked shape.

The only trench that showed any trends in ceramics was Trench 1, where Black-on-Red pottery decreased with increasing depth, as the wares with a red-slipped rim increased. Undecorated ceramics did not appear to change frequency from the top to the bottom. Whether these trends are associated with the two building phases of the terrace is not clear at this time.

There were also differences between the ceramics found in the different terraces. The most important of these is the almost total lack of the decorated ceramics in the lower terraces, that is, the ones still in use. Excavations in the trenches in these terraces recovered Colonial and modern sherds, as well as a kind that has been tentatively identified as Inca, or Inca-influenced. A survey of the lower terraces confirmed the almost total lack of the decorated pottery types associated with the upper terraces.

In addition, the lower terraces had very little animal bone or lithics, while the abandoned terraces had abundant examples of both. Over thirty small, tanged projectile points and hundreds of animal bones were found in Trench 1 alone. The presence of bone and lithics in the other terraces in **Chijra** and

Chilacota suggests that the abandoned terraces were functionally distinct from the lower terraces. A more varied set of activities is thus indicated for the upper terraces. Alternatively, the fill from these terraces could have come from an area where such activities were carried out, while the fill from the lower terraces could have come from elsewhere. This difference could be related to the presence of houses in the upper terraces: those terraces closest to the houses have more bone and lithic debris than the ones farther away. In contrast, there are no houses near the lower terraces. However, even those of the upper terraces far removed from any houses have more bone and lithic debris than the lower terraces, supporting the idea of functional differences between the two areas.

There are also variations in the organization and construction features of the terraces in the two areas. The lower terraces generally have some sort of endwall which sets off groups of terraces from each other. These groups usually consist of tiers of terraces of equal length, which gives a very orderly appearance. This suggests that they were conceptualized and built as a unit. The irrigation canals for these units run horizontally between them, and also down between the endwalls. Water is diverted from the main canals to the highest terrace in a unit, then diverted across the terrace by scratch canals, and finally allowed to fall down the face of the terrace to the one below. In contrast, the abandoned terraces do not have endwalls and are very uneven in length, giving the appearance that they were constructed individually, rather than as a unit.

While a significant amount of analytical work remains to be done, a few preliminary interpretations are in order. The first, and most important, is that the abandoned terraces were probably constructed and used *prior to* the construction of the presently utilized ones. This is suggested by the differences in ceramics in each and by the formal variation present in both sets of terraces and their irrigation systems. Based on the assumption that the Black-on-Red and Black-and-White-on-Red ceramics are Late Intermediate Period in date (Lumbreras 1974; Neira 1961), then the upper terraces date to that period as well. The ceramics on the lower terraces are Inca, Colonial, and modern, thus later.

An Inca date for the lower terraces is also suggested by their formal organization, which is highly reminiscent of Inca terracing elsewhere in the Andes. In addition to the linear terraces, arc-shaped terraces also present in the lower units are very similar to Inca terraces in the Urubamba valley. In contrast, the upper terraces in the Colca valley are much more randomly organized and do not resemble Inca terracing in either form or organization.

Further Questions

An interesting problem yet to be resolved is whether there was any overlap in the use of the upper and lower terraces. The marked dissimilarities in the artifactual content of the terraces in each area argues against their contemporaneity. However, it is conceivable that the Incas continued to use the upper terraces even after the construction of the lower ones, but discontinued the activities indicated by the artifacts found there. This alternative is suggested by the presence of Inca ceramics in the large site of San Antonio, which is located within the abandoned terraces just to the east of **Chijra**.

Another unanswered question is the age of the abandoned terraces. A single radiocarbon date of 290±60 AD exists for the middle layers of Stratum B in Trench 1, which is earlier than the Late Intermediate Period date suggested by the ceramics. However, the sample may date the fill, not the terrace: if the fill was collected from elsewhere, then there may be a considerable discrepancy between the dates of the fill and the terrace construction. It is hoped that forthcoming dates from under the earlier terrace wall will clarify this situation.

It is also uncertain when the Trench 1 terrace was rebuilt, and by whom. There are three possibilities. If we assume that the decorated ceramics all pertain to the Collagua occupation of the Colca valley, as Neira does, then both sets of terraces in the abandoned region are also Collagua. However, the ceramics with red slipped rims may pertain to the early inhabitants of the valley, those preceding (and conquered by?) the Collagua, in which case the earlier terraces were built by the original inhabitants, and the Collagua then expanded them. The third possibility is that some of the Black-on-Red ceramics are Incaic,[1] and that the expansion was directed by the Inca, and the earlier terraces were thus Collagua. Until more is known about the ceramics, the question of who built the terraces must remain in doubt.

It is likewise uncertain what caused the abandonment of the upper terraces. It is tempting to suggest that the abandonment was related to the Inca conquest of the valley. This area today is at the upper limits of maize cultivation, and it is possible that the Inca wanted to maximize their corn production by utilizing the areas lower down. An equally likely alternative is that the Inca utilized both the upper *and* lower terraces, and that the abandonment of the former resulted from the drastic population decline in the valley due to epidemics in the sixteenth century.

A further point requiring clarification is the relationship of the Chuquibamba pottery to other, contemporaneous ceramics in nearby areas. As stated, Chuquibamba appears to resemble most closely the Churajón ceramics from Arequipa. Similarities are also seen to the Allita Amaya ceramics of the Puno region (Lumbreras 1974), and to the Collao ceramics of the western Altiplano (Lumbreras and Amat 1968). Neira (1961) favors the view that the Chuquibamba pottery was a local development out of earlier, yet to be identified wares through contacts with Altiplano groups. However, Lumbreras (1974:207) suggests that the Churajón pottery may reflect an actual colony from the Altiplano. Such could be the case for the Chuquibamba ceramics, explaining both the apparently sudden and pervasive appearance of this series in the Colca valley and its similarities to other Altiplano pottery types. This explanation would also tie in with the ethnohistoric data for multiple ethnic groups with different languages in such a relatively small area of the Colca valley. More research will be needed before this question and the others can be resolved.

Conclusions

From the evidence recovered during our first field season, it appears that the terraces in the Coporaque district of the Colca valley were constructed in at least three phases. The earliest terraces appear to have been built on the mountain slopes, from which point construction of the others proceeded downslope. The earliest terraces are those of **Chijra** and **Chilacota**. These terraces were built in a somewhat random fashion, utilizing runoff from the

snowfields above the valley, which was channeled around the summit of **Yurac Ccacca** by a main canal. Stone-lined feeder canals then brought the water to the terraces located just below the summit, which were probably built by Late Intermediate Period groups including, but not necessarily restricted to, the ethnohistorically documented Collagua. These terraces appear to have been enlarged at least once.

Subsequent to the construction of these terraces, the two irrigation canals currently in use were dug along the east face of the slope below **Yurac Ccacca**, and a much more formalized system of terraces was constructed below them. These later terraces and canals were used both during Inca times and up to the present. It has been suggested that either before, or slightly after, the construction of the lower terraces, the upper ones were abandoned. Alternatively, the upper terraces could have been used through early Colonial times, but not subsequently.

How representative these results are for the rest of the Colca valley remains to be seen. The general pattern of abandoned terraces above presently utilized ones appears to hold for the entire valley. The differences between the presently utilized and abandoned terraces in organization and the use of endwalls also seem to be present in the Lare area (D. Guillet, personal communication), although this suggestion still requires empirical proof. Daniel Shea's archaeological work in the vicinity of Achoma should also provide valuable information as to the generality of the conclusions given here. It is hoped that further research will answer these questions.

Acknowledgments

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Note

1. Craig Morris of the American Museum of Natural History suggested that the llama motifs seen on some of these sherds are very similar to Inca motifs.

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THE TOPARA TRADITION: AN OVERVIEW

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Among the "Paracas Necropolis" materials excavated by Tello (1959) in the 1920's were well-made ceramics with simple modeling but not the incised or painted decoration expected for ceramics of their apparent date. Sherds of the same style were subsequently found mixed with late Paracas and early Nasca style sherds in Strong's 1952 excavations at Cahuachi in the Nazca valley (Strong 1957), leaving this style without clear definition or affiliation.

In 1956, Lanning (1960) excavated in midden he had happened to note right above the beach at the small stopping place on the Panamerican Highway referred to as Jahuay, some 25 km. south of the Cañete valley (Figure 1). He found three distinguishable temporal phases (Jahuay 1-3) of the same well-made but simply decorated style as Tello and Strong had found, but here not mixed with any other style. Shortly after this, I started a survey in the next valleys to the south, Chincha and Pisco (Wallace 1959, 1971). A number of sites were found with ceramics that were related to the Jahuay ceramics, including some isolated from other styles and also some in sub-types of the Jahuay-like types. Lanning and I termed the style the Topará Tradition, and the logical seriation by which we ordered the sub-units was confirmed by my excavation in an 8 m. strata cut at the Quebrada site in Cañete.

To abstract our results, the earliest known phase for the newly defined Topará Tradition has been extrapolated from a surface collection at the Los Patos site in Cañete (Wallace 1963). This is followed by the stratigraphically defined Jahuay 1 and 2 phases from the type site. The lowest levels of my Quebrada excavations would predate Jahuay 3, so I have renamed Lanning's phase as Jahuay 2A and my lowest levels at Quebrada as Jahuay 2B. This is followed by Jahuay 3, interpreted by Lanning as later, but not occurring in direct stratigraphic superposition to the levels containing the two earlier phases. The second earliest of my excavation units from Quebrada does correspond to Jahuay 3, confirming Lanning's temporal ordering.

The stratigraphy of the Quebrada site then continues with Chongos as the next phase, named from the type site in Pisco. The final phase in Cañete is termed Quebrada, with an areal variant in Chincha and Pisco termed Campana. Both Chongos and Quebrada can be subdivided into A and B phases. The uppermost levels at Quebrada contain the distinct sherd decoration which defines the Carmen phase. Carmen dates well within the Early Intermediate Period and is outside the Topará Style Tradition, although clearly derived from its last phases. Therefore, we now have what appears to be a continuous sequence of at least 6 phases, lacking only those covering the first appearance of the distinctive features of the Topará Tradition (Figure 2). Cross-dating with the Paracas sequence to the south is clear for the final phases, in which Topará influence is very marked in phases 9 and 10 in Ica (Menzel, et al. 1964:261). The post-Topará Carmen phase, with its subdivisions, is firmly cross-dated with Nasca phases 3 and 4.

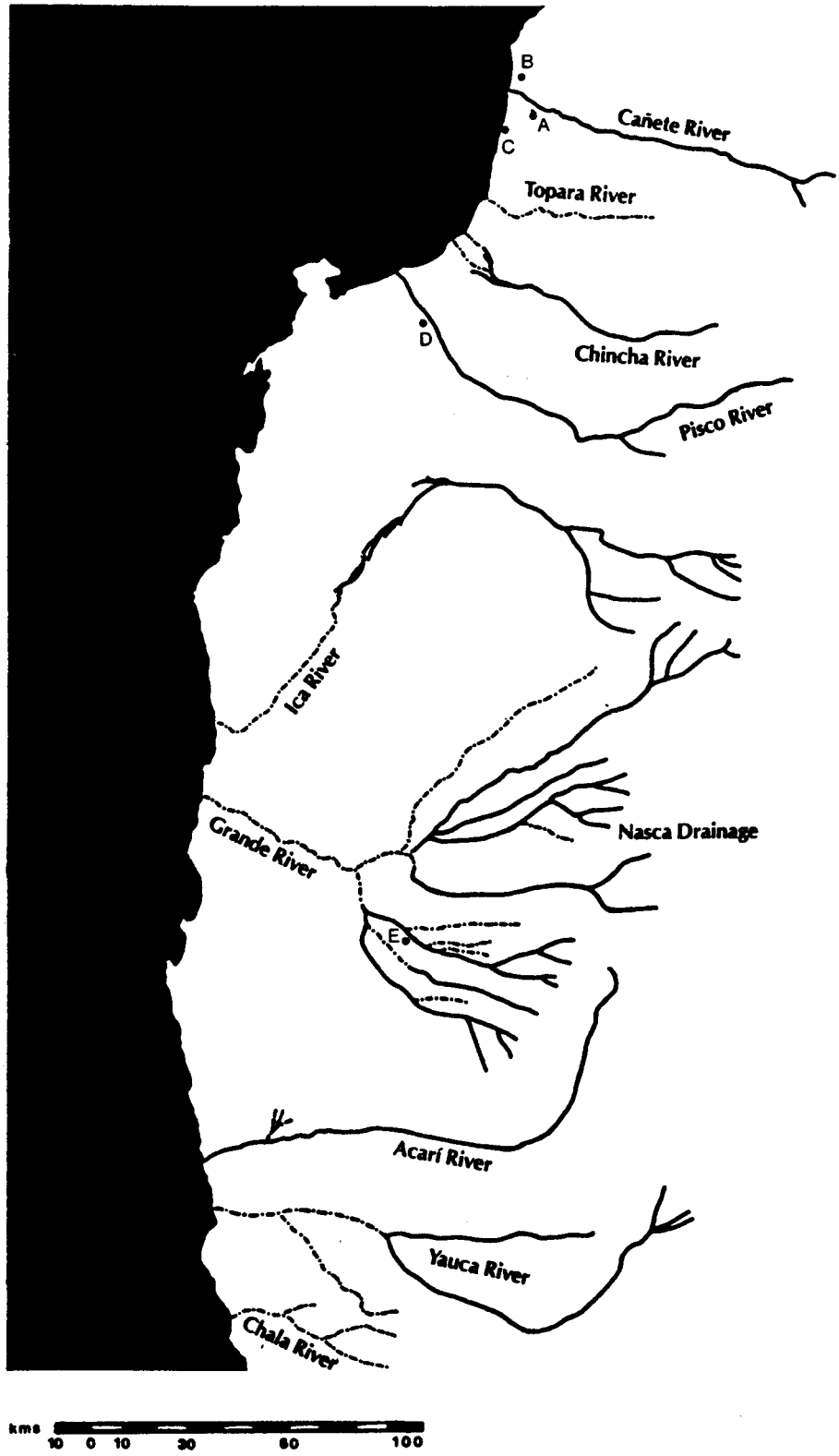


Figure 1. Map of the Peruvian South-Central Coast. The main area in which the Topará style ceramics occur includes the Cañete, Chincha, and Pisco Valleys. The Central Coast Miramar style and the ceramics from Cahuachi on the South Coast are heavily influenced by the Topará style.

Ceramic Sequence

Only an overview of the ceramic sequence can be presented here. The main defining feature is a well-oxidized fine ware, which begins in a reasonably well-made and well-fired form, most notable in contrast with the contemporary wares in adjacent areas, such as Paracas to the south. By the Chongos phase, dating to the late Early Horizon and the beginning of the Early Intermediate Period, this ware had developed into one which technologically equals the best of any period in Peru. Most vessel forms (Figure 3) were either unslipped or self-slipped; surfaces are very well smoothed, helped by the fineness of the clay, although heavy polishing is not overly common. A white (or cream) slip is fairly frequent only among grave wares. Black smudging is commonly accompanied by pattern burnished decoration, which represents the only graphic decoration found in the Topará Tradition, aside from rather crude white banding on Jahuay utilitarian jar neck bases.

Pattern burnished designs include fish as the only well-established representation; geometric designs, especially simple cross-hatching on interior bowl walls, are quite common. The only other relief from this notable lack of graphic decoration other than plain slipping is in the form of simple incised and punctate decoration near the rims of utilitarian ollas of the non-necked or direct rim type in the Patos and Jahuay phases. Shallow incision occurs on fineware, but very rarely.

Simple modeling does show up in grave ceramics that can be attributed without question to the Topará Tradition; the cases occur almost entirely on the double-spout bottle form and include bird, frog, and monkey representation, plus bottle bodies in the shape of squashes and gourds. Sherds showing modeling hardly ever show up in midden deposits.

The only remaining ceramic type of note is the grater bowl. The earliest forms have red slip bands inside the rim of a hemispherical bowl form. The interior base and side walls have linear and punctate incisions, commonly forming simple fish and starfish representations. This type of grater occurs in the Patos and Jahuay 2A and 2B phases in Cañete and at the Jahuay site; it then apparently disappears in this northern area, while there are a number of cases of association with Chongos phase ceramics in Chincha and Pisco. The decoration on these later graters is distinguishable by the common use of a diagonal jab type of short punctation that makes a wedge-shaped impression and turns up ridges of clay to form the grating surface.

The Quebrada and contemporaneous Campana phases are clearly distinguishable by the presence of zoned slipping in black, white, and red-purple pigments. These are applied mainly to the low gambreled bowl form, which has a flattened lip. In Chincha and Pisco, the top of the lip can be a solid black band, the interior a solid red-purple and sometimes the exterior wall a solid black zone. Variations in color placement do occur, but the pattern is distinguishable from the Quebrada phase of Cañete; here interiors can be solid white, with a dark red band in place of black on top of the rim.

Another difference in the apparently contemporaneous Quebrada and Campana phases is the presence in Quebrada of a unique plain ware form of a large jar with convex (or cupped) neck and simple white, washy painting on the neck

	Surface collection, Canete valley	Lanning, Jahuay, stratigraphy	Wallace, Canete, stratigraphy	Isolated in surface lots, Chincha	Isolated in surface lots, Pisco
Los Patos	X				
Jahuay 1		X			
Jahuay 2A		X			
Jahuay 2B			X		
Jahuay 3		X	X		
Chongos A			X		
Chongos B			X	X	X
Quebrada A			X		
Quebrada B			X	X	X
Campana					X
(Carmen)			(X)	(X)	(X)

Figure 2. Sources of data supporting the presently defined temporal phases of the Topará Style on the South-Central Coast. The Quebrada and Campana phases are contemporary, areal variants; Carmen is the first post-Topará style. The A and B sub-phases of Chongos and Quebrada were not apparent in surface lots.

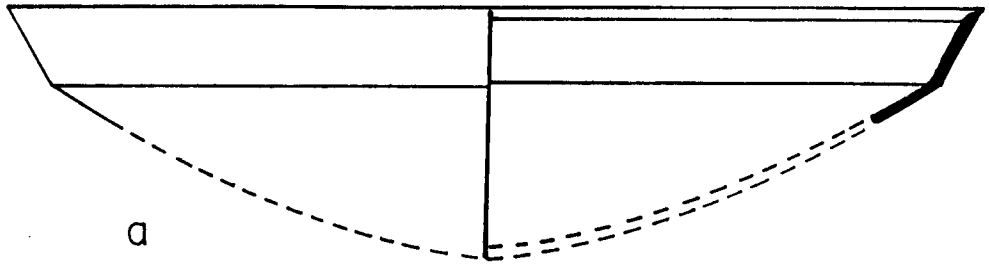
exterior. It seems possible that this form first appeared in the Chongos phase, but again only in Cañete.

In terms of areal distribution, the earliest phases are known only for Cañete or the Jahuay site. Very probable Jahuay 3 ceramics have been found as far south as Paracas, but clearly isolated lots are as yet to be found. The main criterion for the distinction between Jahuay 3 and Chongos A is the lack in Jahuay 3 of a low open bowl or plate with a gambrel or carination between the base and short sides or walls; a very similar form, lacking the gambrel and having instead a sharply convex-curved rim, occurs in Jahuay 3 but apparently does not completely die out until some time during the Chongos phase. The original "Necropolis" ceramics seem to include only the smoothly curved plates of Jahuay 3, suggesting a somewhat early date for Topará occupation so far south.

Chongos and Campana phase sites are quite common in both Chincha and Pisco, completely replacing a local ceramic style (Pinta) that belongs to the Paracas Style Tradition. Campana and also possible Chongos ceramics have been reported as common in the upper Ica valley, free of obvious Paracas influence or co-occupation (Alan Sawyer, personal communication). In the rest of Ica and to the south in Nazca, Topará style influence is quite marked (e.g. Strong 1957), but without close enough correspondence to securely cross-date with specific Topará phases, except for phases dating after Jahuay 2A-B; in most cases, this influence appears as a local adaptation of Topará traits.

In terms of the ceramics, only one quite unique lot remains to be mentioned. At the Chongos site in Pisco, which is quite large and has some distinct subareas, a series of fragments were collected from what obviously had been either a blown-out cemetery or one looted long ago. These consisted of large fragments, some nearly whole pots. The forms included double-spout-and-bridge bottles and the low gambreled bowl form, both corresponding to Chongos phase forms. However, most were well below standard size--about half size, but too large to be called miniatures. The bottle forms were clearly in the rather simple profiles known for "Necropolis" bottles and included the distinctive raised "cap" or lid on top. The workmanship on these bottles and bowls was, however, below par, and the thickness of the walls did not match that of most of the fineware bowls found in the midden. The situation suggests one of intentionally produced grave wares of passable, but still inferior quality. I know of no similar cases beyond this one, even for the graves later excavated by Pezzia near the Chongos site (Donnan, personal communication).

This same group of surface fragments turned up still another unusual feature: an associated form is a short-necked jar (or wide-mouthed globular bowl with low collar) that was quite thick walled, of a heavily tempered body, and quite crudely smoothed on the exterior body, to the point where the diagonal scraping marks could be interpreted as a variety of intentional surface decoration. A unique feature is a rim which varies from having a very thick, comma-shaped rim profile to one in which the rim had been everted out and completely turned back on itself. Still more unique is the fact that nothing even vaguely similar to any of these features is known from any other midden or surface collections, nor from any grave lots here or in Ica. About the only explanation for the unique form is that it might be a highly specialized form equivalent to the canopic jars of Egypt, or even one restricted to lower class burials in contrast to the few known graves from Pisco, Paracas, or further south.



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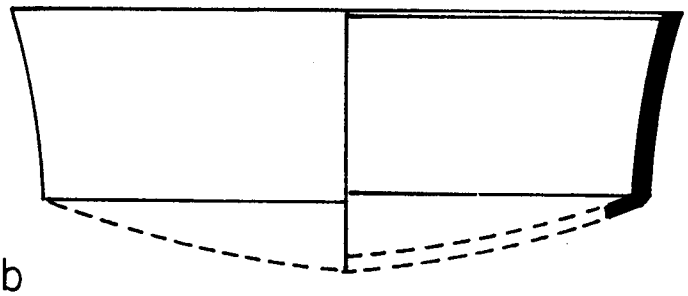

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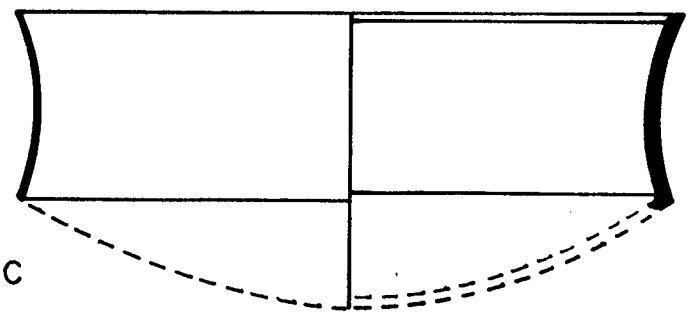

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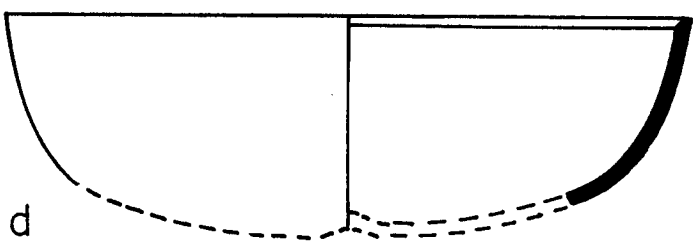

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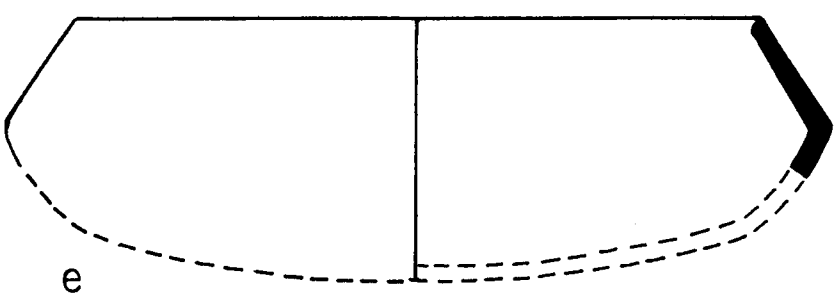

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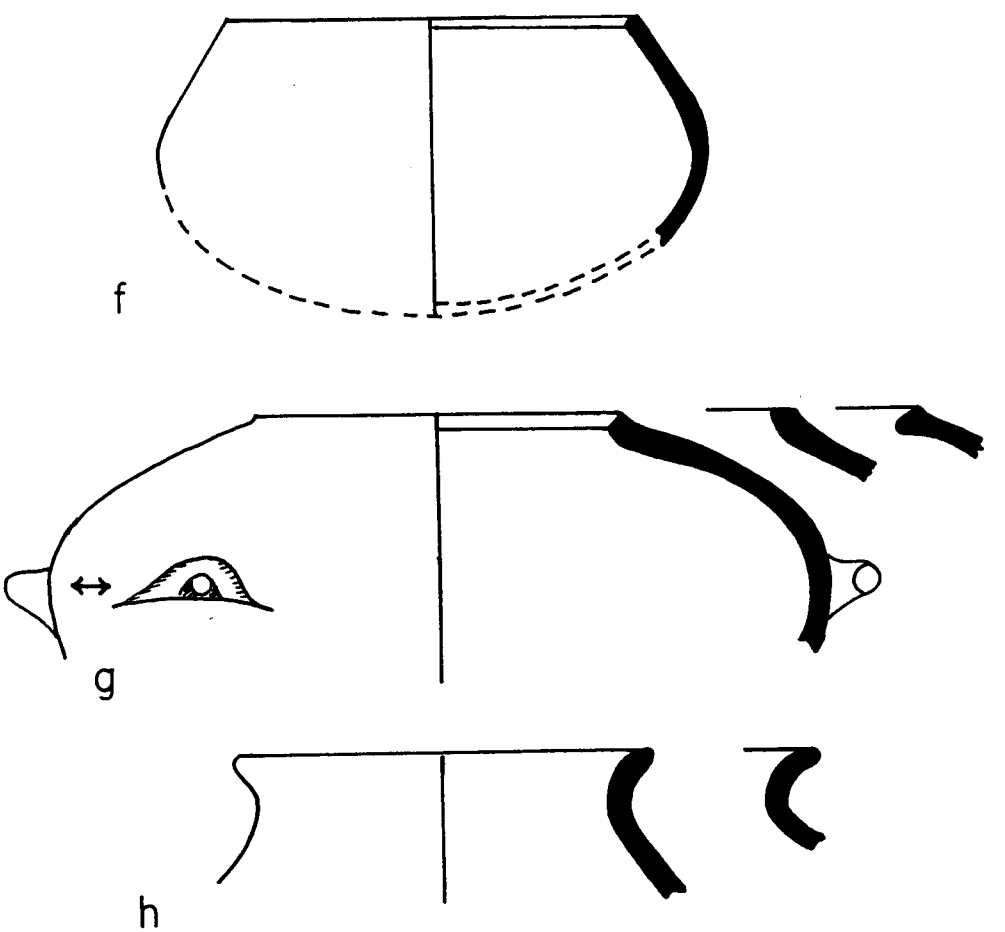

Figure 3. Topará vessel shapes of the Chongos phase. Shapes A-F are orange fine ware, but may be smudged black, shapes A-B with pattern burnished interiors. The gambreled bowl, shape A, is diagnostic. Later vessels are similar, but can have white, red-purple, and/or black zoned slip painting. Shape A is replaced by a low recurved side wall in the earlier Jahuay phases.

I will note only in passing that the textiles from the Jahuay and Quebrada site excavations (Wallace 1979:45) include, as the only cases of decoration, a multi-lineal mode of representation identical in style and embroidery technique to the geometric sub-style noted among the famous textiles from the Paracas sites and also the Ocucaje graves of Ica. I have noted elsewhere (Ibid:48) that this link, along with a pyroengraved head of the Oculate Being on a gourd fragment from the Quebrada excavation (Sawyer 1966:72), suggests that this sub-type, along with the associated pottery, does represent a Topará art style, as opposed to the Paracas or Nasca styles. The Topará style may well have been quite frequently expressed in media other than ceramics. The plainness of the Topará ceramic decoration, combined with its technological excellence, is difficult enough to explain, without having to explain an archaeological culture in Peru and of this period that lacked any more complex decoration than simple modeling and the simple (and quite subtle) decoration of the pattern burnishing.

Site Type and Construction Sequence

The data on architectural construction and site types includes some quite interesting features. The earliest construction in Chincha and Pisco, most likely no earlier than the Jahuay 3 phase, uses adobes of a form that I have termed "corn kernel"; their roughly oval-shaped bases are fairly flat, the cross-section decreasing in size to a very blunt point at the upper end. Another description would be that form falls between a loaf shape and a conical shape. "Corn kernel" adobes approximate but are not completely identical to that termed "odontiform" or tooth-shaped by Tello (1959) at the Paracas sites. As of the present, no adobe types have been found associated with the few non-ceremonial sites located; the form is, however, associated with at least 9 temple mounds (Wallace 1971). In the earliest cases, the adobes are used flat side out for retaining walls, the interiors of which are filled with adobe lumps obviously formed simply by squeezing them between two hands. Somewhat later, both the fill and wall facings are the corn kernel form. The latest variety is slimmer and flatter, with an elongated oval base, looking like flattened mud pies slapped down on one edge to form the flattened base; they are used base down.

Construction methods and materials for buildings other than the temple mounds is still quite unclear. At the Chongos site, at least, stone was used for the walls of buildings to some degree; its use may not have been for more than wall foundations and may also be restricted to sites, like Chongos and also Los Patos, which are outside the valley floors, where stone is readily available and water for adobes is not.

Settlement Patterns

In questions of site type, function, or settlement pattern, the data are greatly limited by the fact that most of the sites, especially in Chincha, are on the valley floor and have been greatly disturbed by later activities, both pre- and post-Columbian. Of those sites which allow interpretation, the Los Patos site in Cañete, the earliest known Topará site, can be described as an agglutinated occupation site of rather large village size. Stone house foundations line the steep sides of an erosional niche in the side of the quite high bluffs that form part of the southern side of the valley. The more level area at the base

has less distinct construction, including one mound that could conceivably have been a temple mound.

The only other probable habitation site with original size and building pattern discernable is the Chongos site in Pisco, the type site for the Chongos phase. Chongos is located just outside the cultivated valley floor. Low outlines of walls formed by rocks and probably disintegrated adobe give some idea of construction. The site is an agglutinated habitation site of a size that would fall into the range of the "urban" centers noted by Rowe (1963) as occurring near the end of the Early Horizon and continuing into the Early Intermediate Period from Chincha south to Nazca. Unlike the other centers between Chincha and Ica, the Chongos site is not only well-agglutinated and at least 40 hectares in size, but also appears to have a nucleus of a central plaza with two neatly aligned structures on opposite sides.

The Quebrada site is also without question an occupation site, with up to 10 meters of superimposed floors, such as those I uncovered during the test excavations. The site consists of a string of closely connected mounds that run for about 1 km. along a very old beach, now well up and away from the shore. None seem to be temple mounds, the cores of which would be mainly fill, so the bulk of the total deposits is very impressive and the length of occupation must have been greater than any nearby site, except perhaps the later Cerro del Oro site just north of Quebrada. The total size of the site and the degree of compactness clearly rivals that of sites such as Chongos; however, the total form would have to be described as a linear village or town, an urban form that is well known elsewhere, but usually confined to associations with linear phenomena such as rivers and roads.

The final style of Topará site that merits description is also the first that occurs in sufficient number to term a pattern. This type includes 9 large temple mound sites in Chincha, with only one or two possible cases in Pisco. That they are mainly solid fill rather than the "tell" form of accreted occupation levels is very evident in most cases. All sites consist of structures aligned perpendicularly to the ocean shore and are higher on the west end. One, the Huaca de Soto site in Chincha, has best maintained the general form of the original. This site consists of three walled courtyards, stepped up from the lower, eastern terminus, and ending on the western extreme with a platform that undoubtedly contained a temple structure. As far as I know, this specific form is unique, although the linear pattern has been noted at such sites as Las Haldas in the Casma valley (Lumbreras 1974:43). I would hardly suggest any close ties between the Chincha cases and the somewhat earlier Las Haldas, but the linear layout may prove to be significant in the future.

It is worth noting that none of the many Topará mounds shows evidence of extensive occupation areas. They would then appear to fall in the ceremonial center type of pattern. But their location in the valley floor, in the center of intense utilization from then until the present, makes it difficult to rule out the original presence of habitations around or near the mounds. However, viewed from the other extreme, the Chongos site lacks any temple mound within or even near the occupation area. We would seem to be dealing with a pattern of separate agglutinated habitation and religious centers. The same holds true for cases of early towns in Ica, Pisco, and Chincha that are either contemporaneous or somewhat later in date.

Cross-Dating

The cross-dating of the Topará sequence with the Paracas and Nasca sequences to the south is not easy, since neither style left much impression on the Topará style. Only a very few trade sherds from the south have been found associated with Topará remains and these were not datable to any one specific Paracas phase. The cross-dating done some time ago by Lanning (1960) was based on the comparison of a cigar-shaped design element found on a Jahuay sherd and used as a design filler on a few vessels dated to the Ocucaje 8 phase in Ica; in addition, an apparent Paracas trade sherd had some incised lines ending in dot finials, a practice now known to range from at least phases 5 through 8. I do not feel that this case is at all sufficient to secure accurate cross-dating. Menzel, Rowe, and Dawson (1964:155) treat pattern burnishing as a trait developed within the Paracas style, which does fit the earlier cross-dating. I, however, feel that it most likely originated in the Topará Tradition because of its salience among Topará decorative techniques and its long and fairly prominent occurrence in the Topará sequence.

The very heavy influence of Topará on the Ocucaje style phases 9 and 10, then continuing into Nasca 1, is well recognized by Menzel, Rowe, and Dawson (1964:259), including recognition that the technical advances of the Topará style undoubtedly led to the switch from post-fired to slip paint decoration. This lop-sided direction of influence is definitely an important point for interpreting the dynamics behind the diffusion of the Topará style.

More direct cross-dating is possible and actually much more reliable with the Central Coast sequence. Patterson (1966) has clearly defined the Miramar style, which has a number of near identities with the Topará style and could easily be considered as an areal variant of a Topará Style Tradition in the sharing of a number of technological similarities and such specific vessel shapes as the low gambreled or carinated bowl. Painted decoration is present, but consists only of very simple non-representational motifs. Patterson places Miramar in the earlier half of the Early Intermediate Period (Ibid:7). He sees the closest correspondence with Topará during the first Miramar phase, Base Aérea, which shares many features with Jahuay 2-3 and especially Chongos. Base Aérea is assigned to Early Intermediate Period Epoch 1 (Ibid:98-99).

Overview

The quantity and scope of data on the Topará Tradition is limited, but some points could serve as the basis for the direction of future work:

1. The technological advances of Topará ceramic production are quite striking and are definitely based on some improvements in firing. These improvements include much greater control of oxidizing firing temperatures, so that smudging and fire clouding can usually be minimized (or applied under control to bowl interiors). Also, a rise occurs in firing temperatures of an average of at least 150° C. Such temperatures are not outside those reached by the best laid of pit firings, but their consistency in Topará ceramics suggests the presence of some feature such as draft channels or a true kiln.

2. A second observation is that the emphasis put on these technological advances is accompanied by an unusual simplicity of decoration, highly unusual

for the Central Andes. It is difficult to avoid the conclusion that Topará potters were proud of their technical prowess and did not want it upstaged.

3. A third observation is the widespread influence of the style on the Central and South-Central coasts. Even more, the complete and rather abrupt wiping out of earlier styles in an advancing southern front of Topará territory, from Cañete to Chincha and Pisco and finally upper Ica, with strong influences south to at least Nazca, is quite complex, with very little comparable influence from the styles that were replaced. Taking into account the technical and decorative distinctiveness between Topará and either Paracas or Nasca, this expansion of a ceramic style tradition is probably one of the most notable ones in Peruvian prehistory and obviously must have been accompanied by some major cultural influence.

4. The few possible Paracas-associated temple mounds, dating to the late phases of the Paracas sequence, contrast with the large number and size of Topará-associated temple mounds in Chincha and also Miramar-associated mounds on the Central Coast. It would seem likely that this form of religious structure, so strongly associated with Topará remains in Chincha, was introduced to the South Coast by bearers of the Topará style during the later part of the Early Horizon. In any case, the general scarcity of large, solid-fill mounds as the bases for religious structures should be noted for much of the South and South-Central Coasts; the numerous Topará-associated temple mounds in Chincha therefore take on special significance.

5. The presence of town-sized urban centers has already been noted. What should be pointed out is that it is precisely at the point of strong Topará influence when the first such centers, with defensive walls, occur in Ica (Rowe 1963:18). It would seem likely that the Paracas town settlement pattern appeared as a response to the physical threat of Topará advance into the area, as did occur in the upper Ica valley. This type of stress-related occurrence is quite significant in terms of the "now you see it, now you don't" history of urban or quasi-urban settlements in this region.

6. The nine temple mounds in Chincha with no evidence of any significant amount of associated habitation areas, along with the lack of a temple mound at the known urban center of Chongos in Pisco, is quite interesting. This locational separation sets the pattern for the settlement types of the Early Intermediate Period of all the South Coast, where the same kind of small urban settlements and any temple mounds are not in close proximity. This is a distinct pattern which deserves more attention than it has had. I refer to it as the town-ceremonial center pattern, with "town" recognized as a distinct, low-scale variety of urbanism, lacking a well-developed, physically impressive nucleus.

7. My last point, or more an area for discussion, concerns the interpretations of the level of political organization associated with Topará. The most common approach has recently been to base the presence of a state level of organization on the assumed presence of certain formal characteristics, such as the presence of a monopoly on force, hierarchical structure, and differential access to basic resources. My question is whether this approach is sufficient, or more to the point, whether it is really what we are looking for. There is a possible argument that the presence of results or actions fitting those which could normally be expected to be achieved only with a state level of organization is

as much evidence, and certainly more concrete, than inferences concerning formal political organization. In short, the nature of the southern expansion of the bearers of the Topará Tradition, with a well-marked advancing front, a one-sided direction of influence, and with influences penetrating well beyond this front of replacement, is a situation that could easily be argued to be the result of a state level type of organization, whether or not there is proof of the formal characteristics now required for acceptance of such an interpretation. In short, is it the formal, organizational characteristics of a society or the outcomes arrived at or the actions taken and results achieved by that society in which we are mainly interested? One obvious, and certainly safe, answer is that we can approach the problem from both ends. In any case, we can await some fascinating results when we have more data on the Topará Tradition.

Acknowledgements

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THE PERUVIAN NORTH CENTRAL COAST DURING THE EARLY INTERMEDIATE PERIOD: AN EMERGING PERSPECTIVE

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The purpose of this paper is to present evidence relevant to the Early Intermediate Period settlement of the North Central Coast of Peru. Evidence will initially take the form of a historical review of pertinent research conducted in this area. This data base will be used to test the idea that during most of the Early Intermediate Period, the occupation of the North Central Coast was concentrated in the upper valley and was linked to the highlands. Data from excavations conducted elsewhere in Peru will then be presented in support of this idea. A brief discussion of the North Central Coast and the Early Intermediate Period follows.

Definitions

The North Central Coast (Figure 1) has been defined on cultural-historical grounds as that part of the Peruvian coast which includes the Nepeña, Casma, Culebras, and Huarmey Valleys (Lanning 1967:32; Willey 1971:87; Daggett 1984:78, Figure 3-1). I have expanded this list to include the Lacramarca and Seco Valleys (Daggett 1984:20, Figure 2-1, p. 21). The Lacramarca, Seco, and Culebras Valleys are formed by third class rivers which, because they fall in the zone of periodic or variable rains, are characterized by a flow which is both scant and rare (Kroeber 1930:74). The North Central Coast as a whole suffers from limited rainfall and it is unique in being the only part of the coast which lacks a first class river, or one originating in the continental watershed (Ibid:74-75). The presence of an eastern intermontane valley formed by a river which ultimately flows to the Pacific is partially responsible for this local coastal hydrology.

The Santa is a first class river, the upper part of which flows northward, dividing the sierra and forming the Callejon de Huaylas. The Nepeña, Casma, and Huarmey Valleys are formed by second class rivers which originate in the Cordillera Negra, the rain-scarce western slopes of this intermontane valley (Adams 1906; c.f. Kroeber 1930:74-75). Finally, the northern-most Central Coast valley, Fortaleza, is also formed by a second class river with its headwaters in the Cordillera Negra (Figure 2).

The Early Intermediate Period (EIP) follows the Early Horizon (EH) (Rowe 1960:628-629) and dates ca. 100 B.C. - A.D. 600. The Early Horizon is characterized by cultural diversity and increasing regional development. Cultures have been defined for the North Coast, the North Central Highlands, and the Central Coast based upon a study of EIP ceramic styles, architectural practices, and general patterns of settlement.[1]

Those cultures best known for the North and Central Coasts during the earlier part of this time period are Gallinazo (Ford 1949; Willey 1953:101-177) and Miramar (Patterson 1966:98-101) respectively. Their stylistic equivalent in the North Central Highlands is Huaras (Lanning 1965; Lumbreras 1974a:85-86,

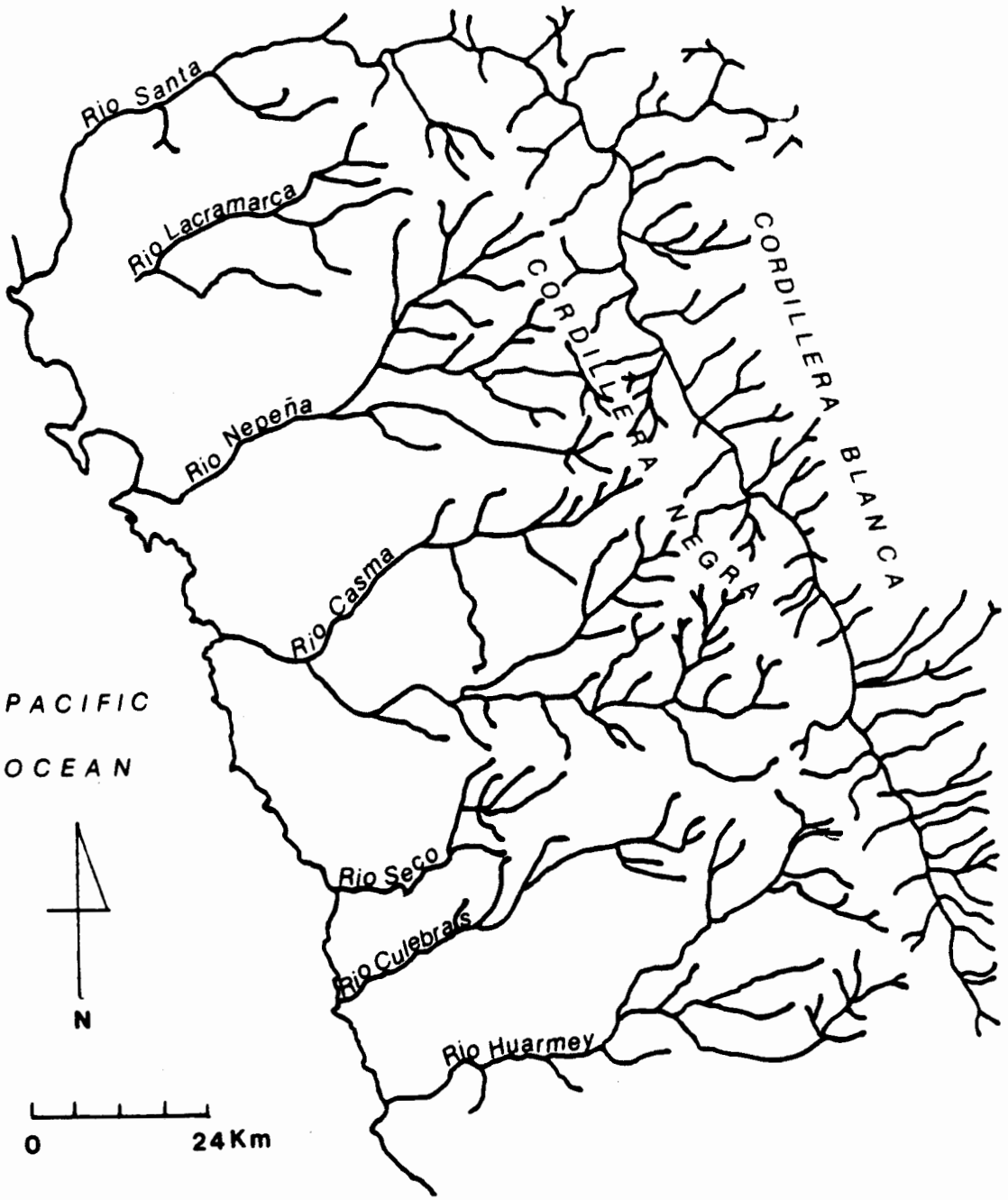

Figure 1. The North Central Coast of Peru.

1974b:39, 50-51). The Moche conquest of Gallinazo during the latter part of the EIP (Moche III-IV) has been well documented (Topic 1982:270, 272-273), while Gordon Willey (1971:142-143) has proposed a political unification of the Central Coast centering on the Lima Culture during this period (Figure 3).

The Moche occupation of the North Coast has been divided into five phases (Larco H. 1948), only the first four of which date to the EIP (e.g. Topic 1982:-256). The political unification of the North Coast was achieved toward the end of this time period during phases III and IV. Both Moche and Lima are characterized by the construction of large adobe pyramids (Lanning 1967:117). In this they differ from Recuay, which was the highland successor of Huaras (Lanning 1965), and which was essentially contemporary with Moche (Grieder 1978:75, Table 10) and Lima. Instead, Recuay is characterized by the construction of tombs (Amat 0. 1976:535) and the creation of distinctive stone sculpture (Schaedel 1948).

To summarize, the North Central Coast consists of six valleys (Lacramarca, Nepeña, Casma, Seco, Culebras, and Huarmey) and it is bordered on the north by the Santa Valley, on the east by the Callejon de Huaylas, and on the south by the Fortaleza Valley. The EIP has been described as a time during which political unification was ultimately achieved on the North and Central Coasts. Finally, specific EIP cultures have been identified for the coastal and highland areas which border the North Central Coast.

History of North Central Coast EIP Research

Research focused upon an earlier time period inadvertently shed light on the nature of the settlement of the North Central Coast during the EIP. In 1933, Julio Tello excavated the site of Punkurí (PV31-10) in the middle Nepeña Valley (Figure 4). He uncovered an occupational sequence there which spanned from Chavin to Moche (Tello 1933a). He had delayed excavating Punkurí for a number of years because of his admitted lack of interest in what he thought was a Moche site (Tello 1933b). His success in documenting Chavin in Nepeña led him to work in Casma and one result was the discovery there of Moche vessels in local collections (Tello 1956:308, Figure 141). This prompted the conclusion that both the Nepeña and Casma Valleys had fallen within the sphere of Moche influence (Bennett 1946:100).

During the 1940's there was a decided emphasis on Chavin research in Peru (Schaedel and Shimada 1982), and it was not until 1950 that EIP research was seriously begun on the North Central Coast. At that time Richard Schaedel (1951) conducted a coastal survey aimed at determining the extent of Moche influence. He was led to the ruins of Pañamarca (PV31-38) in the middle Nepeña Valley, and his excavations there confirmed earlier suspicions (Soriano I. 1941:265) that this impressive adobe pyramid indeed dated to Moche times.

The Casma Valley was included in Schaedel's survey as well, but his report makes no mention of Moche discoveries there. This apparent absence of a Moche occupation in Casma was supported by a subsequent survey conducted by Donald Collier and Donald Thompson. They surveyed the lower to middle valley, utilized aerial photography, and concentrated on architectural sites nearly to the exclusion of looted cemeteries (Thompson 1974:9). In spite of the Moche artifacts reported by Tello, they were unable to find any evidence for a

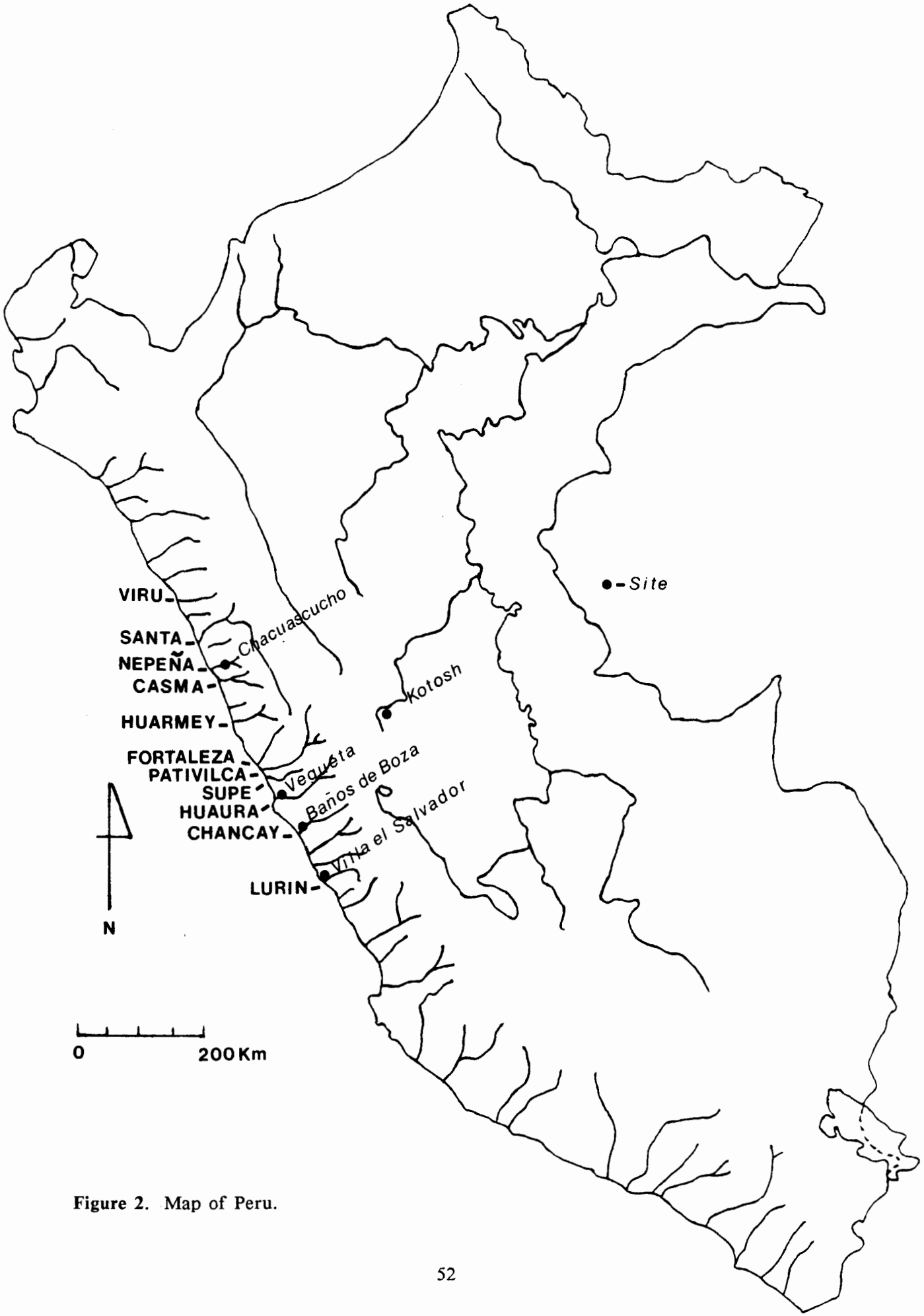

Figure 2. Map of Peru.

Moche occupation in Casma, nor a Lima or local equivalent (Collier 1960:415; Thompson 1962:297-298). They concluded that there were no major sites or pyramids dating to the EIP in Casma and that the EIP occupation there would likely prove to be both small and rural (Thompson 1962:299).

Thompson continued working on the North Central Coast, first conducting research in Culebras in 1959 (Tabio E. 1977:100) and then continuing the systematic survey of Huarmey begun the year before by Ernesto Tabio and Duccio Bonavia (Ibid:99-100). Thompson completed his survey of Huarmey in 1965. Rare finds of Moche pottery (Ibid:112-113) and the absence of architecture attributable to Moche, Lima, or a local cultural equivalent led him to conclude that this valley, like Casma, had probably been occupied by a simple rural culture during the EIP (Thompson 1966:544).

In 1967, Donald Proulx began a systematic survey of the Nepeña Valley. With the aid of aerial photographs, he was able to document a Recuay occupation at the upper valley ceremonial site of Huancarpon (PV31-59) (Proulx 1968:100-101). In addition, he found evidence for a Recuay burial near Pañamarca in the middle valley (Ibid:100).[2] Though he also found a few more Moche sites in the middle valley, the apparent paucity of EIP sites overall led him to conclude that the Moche and Recuay occupations of the valley were limited (Ibid:27-30).

The following year, 1968, Rosa Fung and Carlos Williams (1977) worked in the Sechin or northern branch of the upper Casma Valley. Based upon an analysis of archaeological remains, they proposed a valley sequence which included highland influence in the early EIP phases and local development in the later phases of EIP occupation (Ibid:137, 143). Their early date for the Casma culture is not supported by the Nepeña data, however, which suggest instead a post-EIP date for this culture (C. Daggett 1983; Proulx 1973:61).

Proulx continued his survey of Nepeña in 1973, documenting more Moche sites in the middle valley (Proulx 1973:40-44) but failing to find more Recuay sites. He concluded that the Moche occupation of Nepeña was heavily concentrated in the middle valley and essentially Moche IV in date (Ibid:48). Data for the non-Moche EIP settlement of the valley were limited to two Recuay sites and a few Gallinazo ceramics seen in local collections (Ibid:31).

In 1979, Proulx invited me to assist him in a concentrated survey of the upper Nepeña Valley. A principal result was our discovery of a significant number of Recuay ridgetop sites. This led us to the realization that the valley had experienced distinct upper valley Recuay and lower to middle valley Moche occupations (Proulx 1982). I continued working in the upper valley in 1980-1981 and now present certain conclusions about the nature of the settlement of the valley at the end of the EH and the beginning of the Early Intermediate Period.

The upper valley site of Huancarpon appears to be a late EH ceremonial center which remained occupied during the EIP (R. Daggett 1983, 1984:295-297, 351-353). The existence of earlier public architecture there explains why Huancarpon is the only Recuay site in the valley clearly visible from a study of aerial photographs. The upper valley is rich in EIP sites and among the new sites that I found there are a few that were occupied during Moche times (Daggett 1984: Appendix A; Proulx 1982). Their discovery serves to establish the expected valley-wide Moche occupation of Nepeña (Topic 1982:279) and

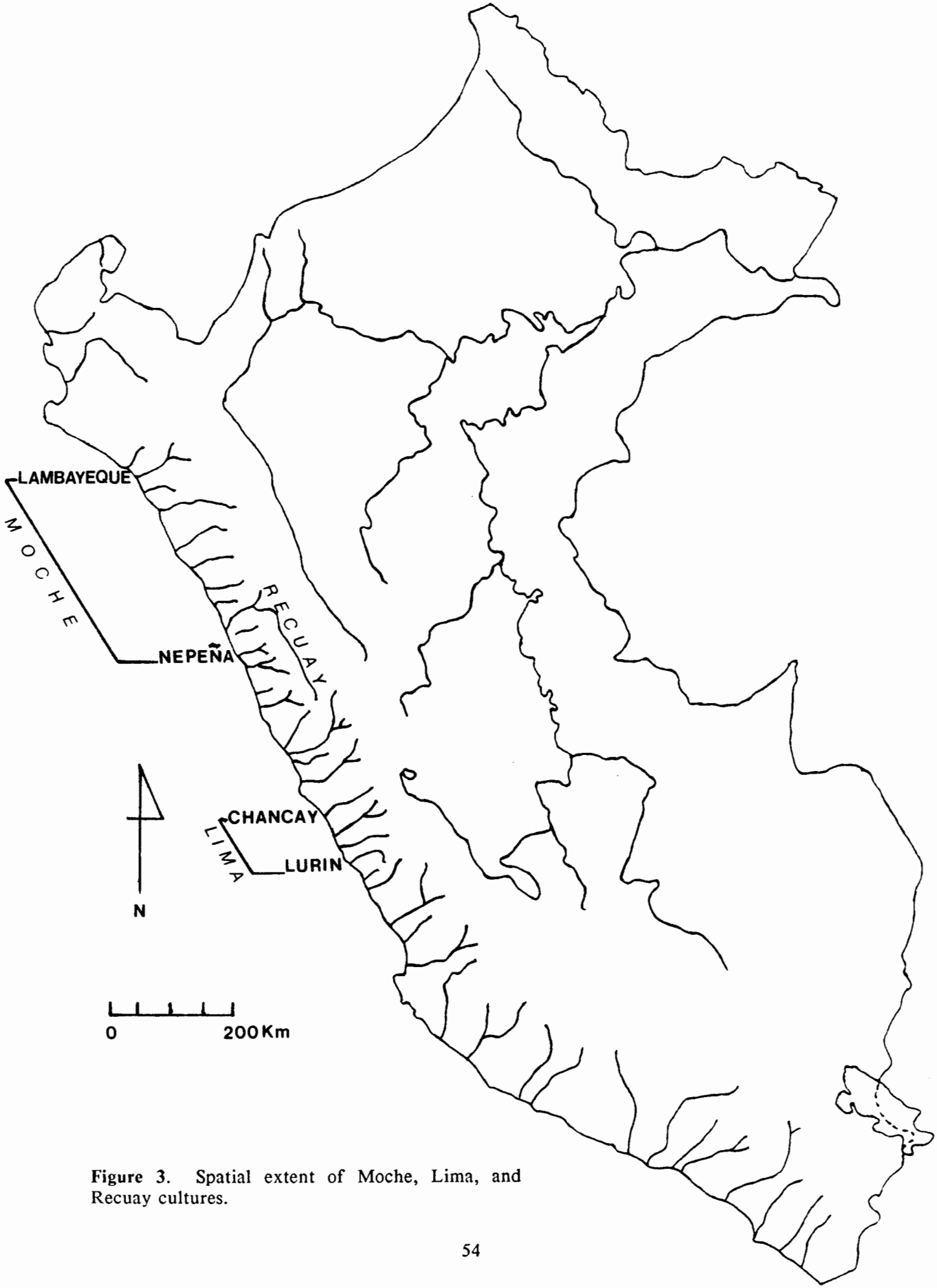

Figure 3. Spatial extent of Moche, Lima, and Recuay cultures.

conforms to previously observed patterns in that this occupation was both late EIP in occurrance and heavily concentrated in the middle valley.[3]

The most important of the newly documented EIP sites in Nepeña are the contiguous upper valley ridgetop sites of Cerro Chacuascucho West (PV31-184) and Cerro Chacuascucho East (PV31-185). The former appears to date to the start of the EIP while the latter became important later during this period (Daggett 1985). Information from these sites and from previous surveys suggests that the pre-Moche occupation of Nepeña was upper valley ridgetop in kind and highland in orientation. The absence of a Gallinazo or Gallinazo-like occupation in the lower valley (Ibid) supports this conclusion as does the data obtained from Lacramarca.

David Wilson recently conducted a systematic survey of the Santa Valley which he extended southward to include the mouth of the Rio Lacramarca. The EIP occupation of this part of the Lacramarca Valley consists of a Moche III-IV settlement which was *not* preceded by a Gallinazo one (Wilson 1981:52-53). The absence of a demonstrable Gallinazo occupation in Lacramarca and Nepeña in contrast with evidence for just such an occupation in Santa (Donnan 1973:125; Wilson 1981:47-52) strongly suggests that the North Central Coast was essentially isolated from North Coast influences until late in the EIP; that is, not before Moche III-IV times.[4] Finally, recent work in Casma and Huarmey makes it clear that valleys to the south of Nepeña remained all but unaffected by North Coast traditions even during Moche times.

Three Moche or Recuay-influenced vessels have been excavated by Tom and Shelia Pozorski from an intrusive burial at an EH site in the lower Casma Valley (Pozorski and Pozorski 1981:44-46, Figure 35). This discovery serves to validate the presence of such artifacts in Casma but provides little information regarding the nature and extent of the resident population responsible for their interment.

In the Huarmey Valley, a total of twenty-one (21) sites have thus far been assigned to the EIP by Bonavia, each of which he describes carefully, though artifactual detail remains scanty (Bonavia 1982: Appendix). Ten Moche sites are discussed, six of which represent limited reoccupations of earlier sites, while three of the remaining four were reoccupied during the subsequent Middle Horizon. The one single component site is a Moche III cemetery (Ibid:424). As for the eleven non-Moche sites, all are multi-component in nature, one is an upper valley Recuay terraced habitation (Ibid:421), and another may be similar to Cerro Chacuascucho East in Nepeña (Ibid:430).[5] Despite Bonavia's continuing efforts, then, the survey of Huarmey has not yet led to a breakthrough in the understanding of the EIP settlement of the valley.

To briefly summarize, serious research on the nature of the EIP settlement of the North Central Coast did not begin until the 1950's. Though the documentation of the Moche settlement in Nepeña was an anticipated result, the absence of Moche or Lima evidence in Casma and Huarmey was not. Subsequent efforts to ascertain the nature of the EIP occupation of these latter two valleys has proven difficult. Recent work in Nepeña has led to the realization that there was a significant pre-Moche upper valley ridgetop occupation there with links to the highlands. Whether the North Central Coast as a whole was linked to the highlands during the EIP remains to be demonstrated, but preliminary data support this model.

Number	Name	Elevation
10	Punkuri	210 m
38	Pañamarca	110 m
59	Huancarpon	650 m
184	Chacuascucho W.	800 m
185	Chacuascucho E.	815 m

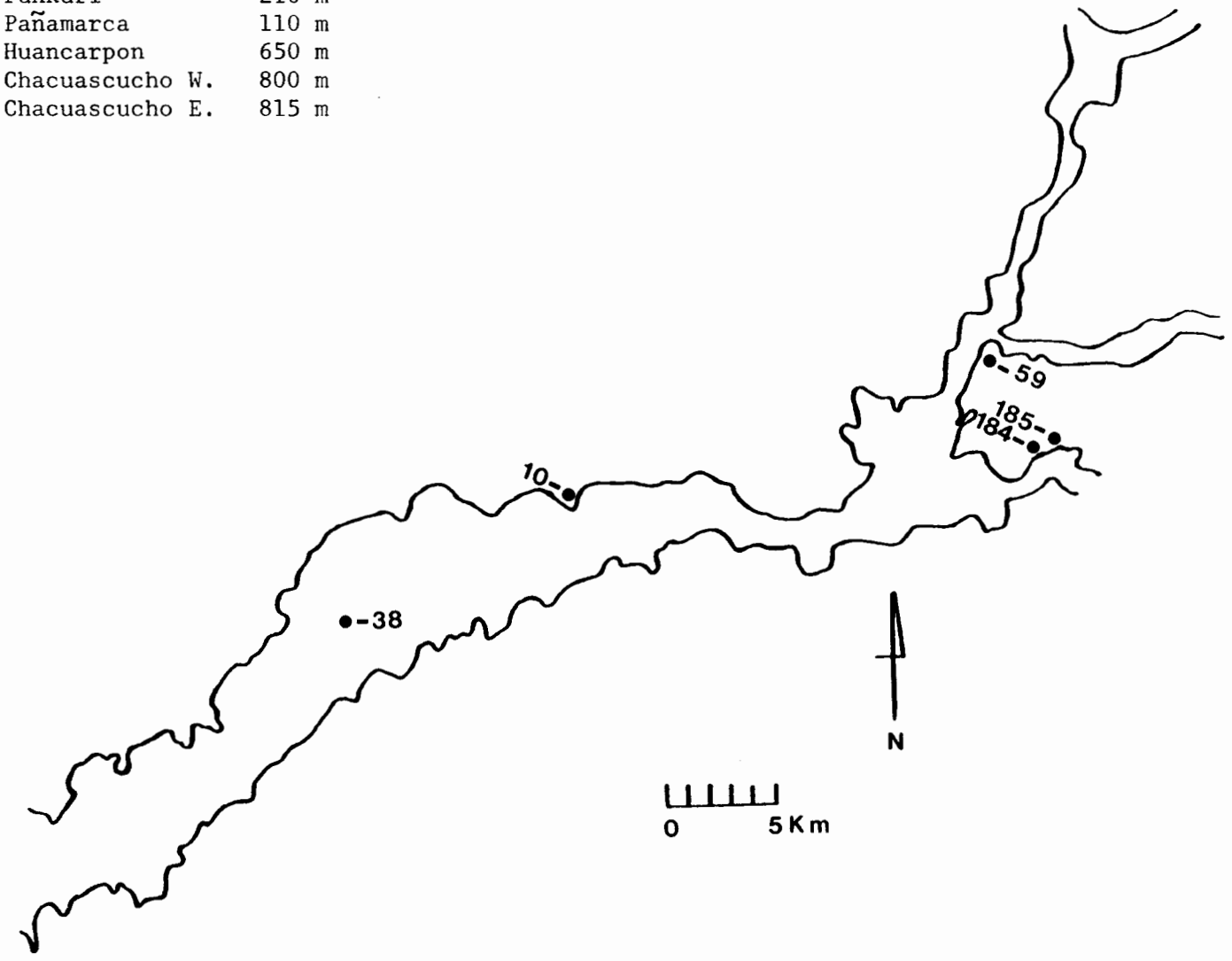

Figure 4. Map of Nepeña showing location of specific EIP sites.

An Emerging Perspective - Frontier Evidence

Evidence is available from the northern, eastern, and southern frontiers of the North Central Coast which hints at a high degree of interaction between this part of the coast and the neighboring Callejon de Huaylas. On the northern frontier, the Santa Valley experienced a marked Recuay occupation (Wilson 1981:48, 51), in addition to the Gallinazo and Moche occupations already mentioned. This Recuay occupation was heaviest in the upper valley (Ibid:48) and, as in Nepeña, the advent of the Moche conquest was accompanied by a major shift in settlement patterning (Ibid:53). In contrast, Recuay evidence is rare in Viru, one valley removed from and to the north of Santa (Strong and Evans 1952:348-351; Topic and Topic 1982:9), though evidence does exist in Viru for a major Gallinazo development (e.g. Willey 1953:31). These data suggest that Santa maintained strong coastal and highland cultural traditions during the EIP while adjoining valleys to the north and south emphasized coastal and highland cultural traditions respectively.

On the Central Coast, the Chancay Valley marks the northern limit of Lima expansion (Willey 1971:142-143). Given the absence of information concerning the EIP settlement of the Fortaleza, Pativilca, and Supe Valleys (Thompson 1966:544), data recovered from other Central Coast valleys takes on added importance. Recent excavations which have been conducted at Villa el Salvador on the Tablada de Lurin (Stothert 1980; Stothert and Ravines 1977) and at Vegueta in the lower Huaura Valley (Shady and Ruiz 1979a, 1979b) have served to broaden knowledge about the nature of the early EIP occupation of the Central Coast.

The EH ceramic assemblages of the Central Coast are characterized by neckless jars, bottles, and plastic decorative techniques. The EIP assemblages, however, are characterized by a marked decrease in all of these features and a concommitant increase in painted decoration and necked jars with strap handles.[6] Artifacts found at Vegueta compare favorably with those excavated at Villa el Salvador (Shady and Ruiz 1979a:56). This observation suggests a similarity in artifact assemblage for sites along the Central Coast during the early EIP. Support for this idea comes from a third site in the lower Chancay Valley which was excavated decades before (Willey 1943). Baños de Boza is known to have been occupied at the start of the EIP (Patterson 1966:110), and the necked jars with strap handles found there are similar to those found at both Vegueta (Shady and Ruiz 1979a:54, 58) and Villa el Salvador (Stothert 1980:288; Stothert and Ravines 1977:188). Further comparative analysis suggests that this similarity in artifact assemblage may be extended to the North Central Coast by way of the North Central Highlands.

The artifacts found at Vegueta have been compared with artifacts found in the highlands. In general, they are said to be like those typically found at Huaras sites in the Callejon de Huaylas and most like those which distinguish the Higueras occupation at Kotosh (Shady and Ruiz 1979a:58). Excavations at Kotosh have produced a distinctive set of EIP artifacts (Izumi and Sono 1963:156-158) comparable not only to those excavated at Vegueta but also to those found on the surface at Cerro Chacuascucho East in Nepeña (Daggett 1985). In particular, the large mortars, ceramic spoons, and necked jars with strap handles found at Cerro Chacuascucho East are very similar to those found at Kotosh. In view of this fact, it is suggested that artifacts distinctive of the early EIP occupation of the Casma, Seco, Culebras, and Huarmey Valleys will

likely bear a resemblance to artifacts found on Cerro Chacuascucho East in Nepeña. As to the projected location and configuration of as yet undocumented sites in these four valleys, their setting at higher elevations and on ridgetops is expected.

Finally, Recuay sites have been reported for the eastern frontier along the slopes of the Cordillera Negra; specifically, the upper tributary regions of the Nepeña (Gambini 1975:120), Casma (Smith 1978:46), and Huarmey (Schaedel 1948) Rivers. I have already discussed the strong Recuay occupations of the upper Santa and Nepeña Valleys and the lack of evidence for a Moche or Lima occupation in the lower to middle Casma and Huarmey Valleys. These facts support the idea that there was an upper valley Recuay occupation of the entire North Central Coast.

Concluding Remarks

To conclude, large adobe pyramids situated at lower elevations characterize the EIP settlement of the North Coast and the Central Coast. Researchers had assumed a similar EIP settlement of the North Central Coast. Hence, research strategies were developed which emphasized the discovery of ruins with high visibility and relatively easy access. This approach succeeded only in the Nepeña Valley and this fact suggested that other North Central Coast valleys had experienced a rural occupation. However, the occupation of the lower to middle Nepeña Valley is now known to date late in the EIP and it was preceded by an upper valley rural occupation linked to the highlands.

Mounting evidence suggests that the EIP occupation of Nepeña was concentrated on upper valley ridgetops and that pyramids were constructed in the middle valley only toward the end of this period. This dramatic change in valley settlement is reflected in the nearby Santa Valley. For those working on the North Central Coast, these observations suggest the viability of a research strategy which emphasizes the discovery of upper valley ridgetop sites or those marked by low visibility and relatively difficult access. Success in this venture will secure the emerging perspective that the EIP settlement of the North Central Coast was fundamentally different from that of neighboring parts of the coast. Why this was so is but one of a host of new questions which would certainly result from this realization.

Acknowledgments

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Notes

1. The EIP of the North Coast is not well dated in absolute terms (Topic 1982:256); instead, there is a clear emphasis on relative dating. There is a like emphasis on relative dating for the Central Coast (e.g. Stothert-1980:291, Table 1). As for the North Central Highlands, despite the recent publication of a series of radiocarbon dates (Grieder 1978:191-193), there remains an emphasis on relative dating (Ibid:75, Table 10).

2. The Nepeña Valley has been arbitrarily divided into lower, middle, and upper parts (Proulx 1968:5). The difference in elevation at river level between different parts of the valley reflects a gradual rise from the lower through the middle parts of the valley and then a much more rapid incline throughout the upper part of the valley. These valley parts generally fall within the following ranges of elevation, respectively: 0-100 meters, 101-325 meters, and 326-1500 meters above sea level.

3. The heaviest concentration of Moche III-IV sites, and the largest of them, in the Viru (Willey 1953:178-234) and Santa (Wilson 1981:52) Valleys are found at elevations equivalent to the middle Nepeña Valley.

4. Numerous Gallinazo sites have been reported for the lower Viru (Willey 1953:178-234) and lower Santa (Wilson 1981:47-52) Valleys. This suggests that, if there had been a Gallinazo occupation of Lacramarca, some evidence should have been found in the lower part of this valley, too. The absence of such evidence to date suggests that no such occupation occurred.

5. Like Cerro Chacuascucho East, this is an upper valley ridgetop site characterized by large grinding stones and the remains of countless utilitarian vessels (Bonavia 1982:430).

6. Elsewhere (Daggett 1985), I have discussed major differences between North Coast (Gallinazo) and North Central Coast (Chacuascucho) early EIP ceramic assemblages. These assemblages reflect distinct cultural traditions and one conclusion of this paper is that the early EIP assemblage of the North Central Coast draws inspiration from the cultural tradition of the Central Coast.

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A SEQUENCE OF MONUMENTAL ARCHITECTURE FROM HUAMACHUCO

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Introduction

During four seasons of fieldwork in Huamachuco, I have become intrigued by the possible connections between the monumental architecture in that area and widely scattered examples of Huari and Inca architecture.

My interest in this problem stems from two different sources. First, there is increasing evidence that the Huamachuco architectural tradition has great time depth and largely developed independently of other architectural traditions. By the end of the Early Intermediate Period (Thatcher 1975; Topic and Topic 1983), immense monumental buildings were being constructed in a uniquely local style. Secondly, the increase in opportunities for interaction during the Middle and Late Horizons may be reflected by architecture. We have, in fact, discovered evidence for interaction between the local Huamachuco tradition and Huari and Inca architecture.

One such case, **colcas** or storerooms, has been discussed briefly in a preliminary report (Topic and Topic 1984). In Huamachuco, Huari and some Inca storerooms have raised floors with a ventilated crawlspace below. A similar type of floor construction may occur at Huari sites such as Jargampata (Isbell 1977:76) and Azangaro (Anders, personal communication), but to my knowledge does not occur at Inca sites outside the Huamachuco area. Because of this restricted distribution, and because the Huari storerooms in Huamachuco are earlier than the other examples, we have suggested that this type of floor construction may derive from a local tradition of attic storage.

The other type of building, which we have called the niched hall, is the subject of this paper. We first recognized the niched hall as a distinctive type of building at Viracochapampa. Viracochapampa is the major Huari center in the north highlands and is located just outside modern Huamachuco. Construction of the site probably began early in Middle Horizon 1b (Thatcher 1975; Topic n.d.) but was never finished. Some niched halls at Viracochapampa are almost 50 m. long and up to 19 m. wide (McCown 1945:268-269). After seeing these monumental buildings, I was impressed by the general similarity, in terms of size, multiple niches, and location on plazas, to the Inca **kallanka** type of building (Gasparini and Margolies 1980:196-219). Gasparini and Margolies (1980:199-200) suggest that these buildings may have housed festivals, religious ceremonies, troops, or other large groups of people serving the **mit'a**. In Huamachuco we have found some similar but much smaller (7 x 18 m.) buildings without (preserved) niches associated with Inca storeroom complexes; these buildings may have housed cargo bearers or served as roofed sorting and accounting areas for the materials destined for storage. Although the **kallanka** is widely distributed at Inca sites, its Middle Horizon analogue is surely present at only one Huari site, Viracochapampa, and possibly present at another, Pikillacta in the Cuzco area (McEwan 1984).

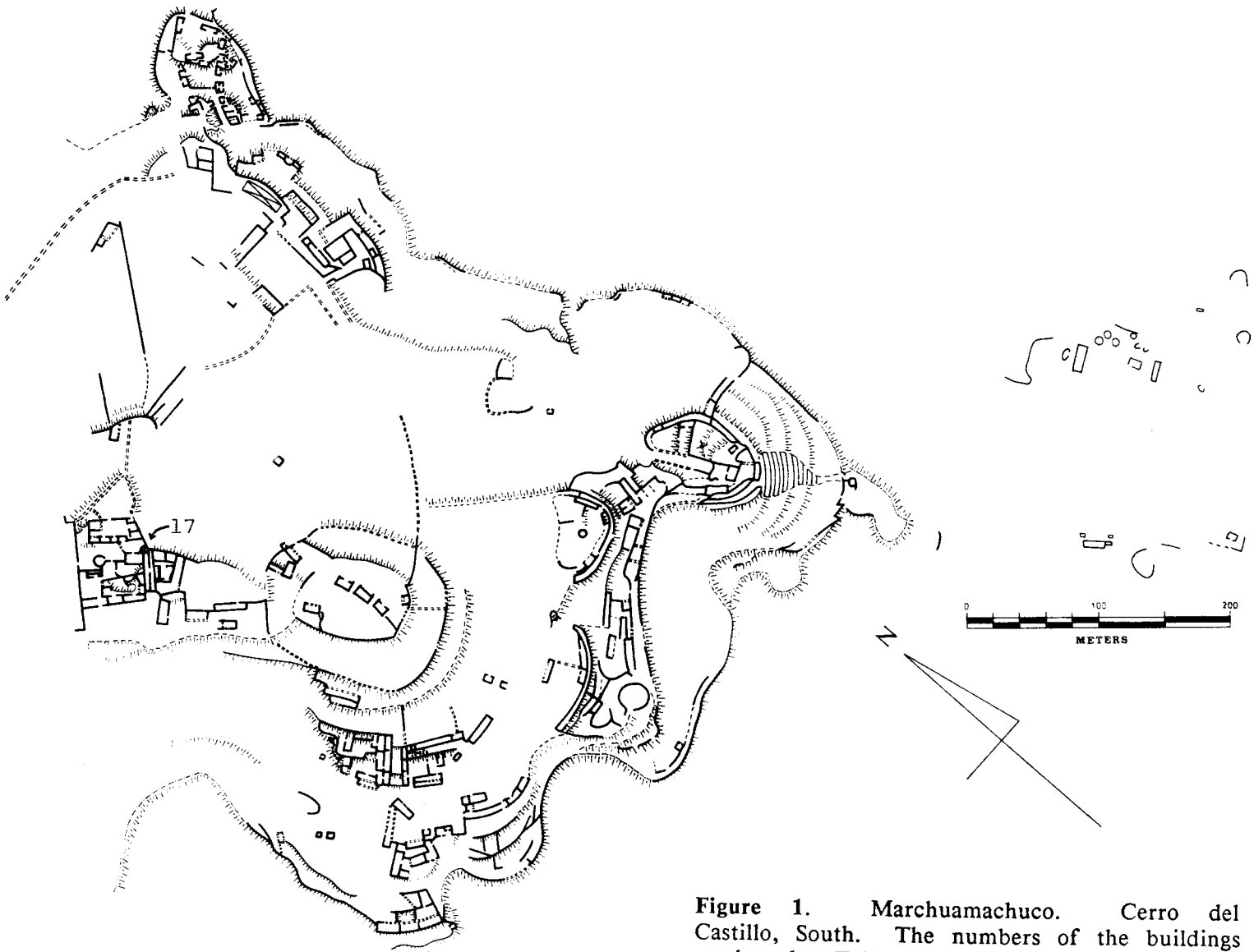

Figure 1. Marchuamachuco. Cerro del Castillo, South. The numbers of the buildings are keyed to Table 1 and the text.

Both storerooms and **kallanka** were intimately related to the ritual and economic functioning of the Inca empire. The fact that similar types of buildings are associated with the Huari presence in Huamachuco suggests that there was a historical continuity between Huari and Inca times in architectural types as well as in some activities housed in the architecture. Moreover, the restricted distribution of Huari niched halls indicates that they were derived from the Huamachuco architectural tradition. My intention here is to explore these possibilities by developing a sequence of architecture at Marcahuamachuco, the largest site in the Huamachuco area.

Marcahuamachuco and the Huamachuco Architectural Tradition

The site of Marcahuamachuco covers the top of a natural plateau (3400 m.a.s.l.) which dominates the entire Huamachuco area. The plateau is approximately 5 km. long and .5 km. wide, and ruins are scattered across the whole area. The most densely occupied area is at the southeast end of the site and is generally called Cerro del Castillo (Figures 1 and 2). To the northwest of Cerro del Castillo is a sparsely occupied area dominated by many round or oval constructions; this area encompasses what McCown (1945) referred to as Cerro de las Monjas and Cerro de los Corrales (Figure 3). At the extreme west end of the site is Cerro Viejo (Figure 4), which has evidence of an early, medium density occupation.

The constructions at Marcahuamachuco date between about A.D. 400 and A.D. 1000 and illustrate the greatest development of the Huamachuco architectural tradition. Although several different morphological forms (rectangular, curvilinear, and circular) are represented in the ground plans, McCown pointed out that there is an essential similarity in all the monumental constructions which results in a "...building of great narrowness, great height, and very great length" (1945:252). He called this type of building a gallery, noting that "...the lengths are rarely less than six times the width and it is not uncommon for them to be eight, nine, or ten times as long as they are wide" (1945:252). Here he was referring specifically to rectangular galleries, and it is worth noting that some curvilinear galleries have lengths almost 100 times their widths.

It is also worth noting that these descriptions refer to buildings, not necessarily to rooms. A building may be defined as a space enclosed by a single unified façade and roof. Within a building there may be dozens of rooms as well as multiple entrances. In the case of Marcahuamachuco this distinction between buildings and rooms is particularly important, since many buildings are multistoried and may have many small rooms separated by masonry partitions on the ground floor but long, narrow rooms on the second and third stories.

The architectural tradition of long, narrow buildings has great time depth in the Huamachuco area. It began at least as early as the Early Horizon, and sites like Cerro Campana East, Cerro Campana West, and the Cahuadan "forts" are good examples (McCown 1945: Figure 12). All of these sites have buildings of great narrowness and great length, although there is no indication of great height. At these sites, the diversity of rectangular, curvilinear, and circular ground plans is already evident. There is also, however, a certain degree of continuity in these ground plans. Rectangular galleries occur at Cerro Campana East while long rectangular rooms are incorporated into a curvilinear gallery at Cerro Campana West; that curvilinear gallery partially encloses a circular gallery

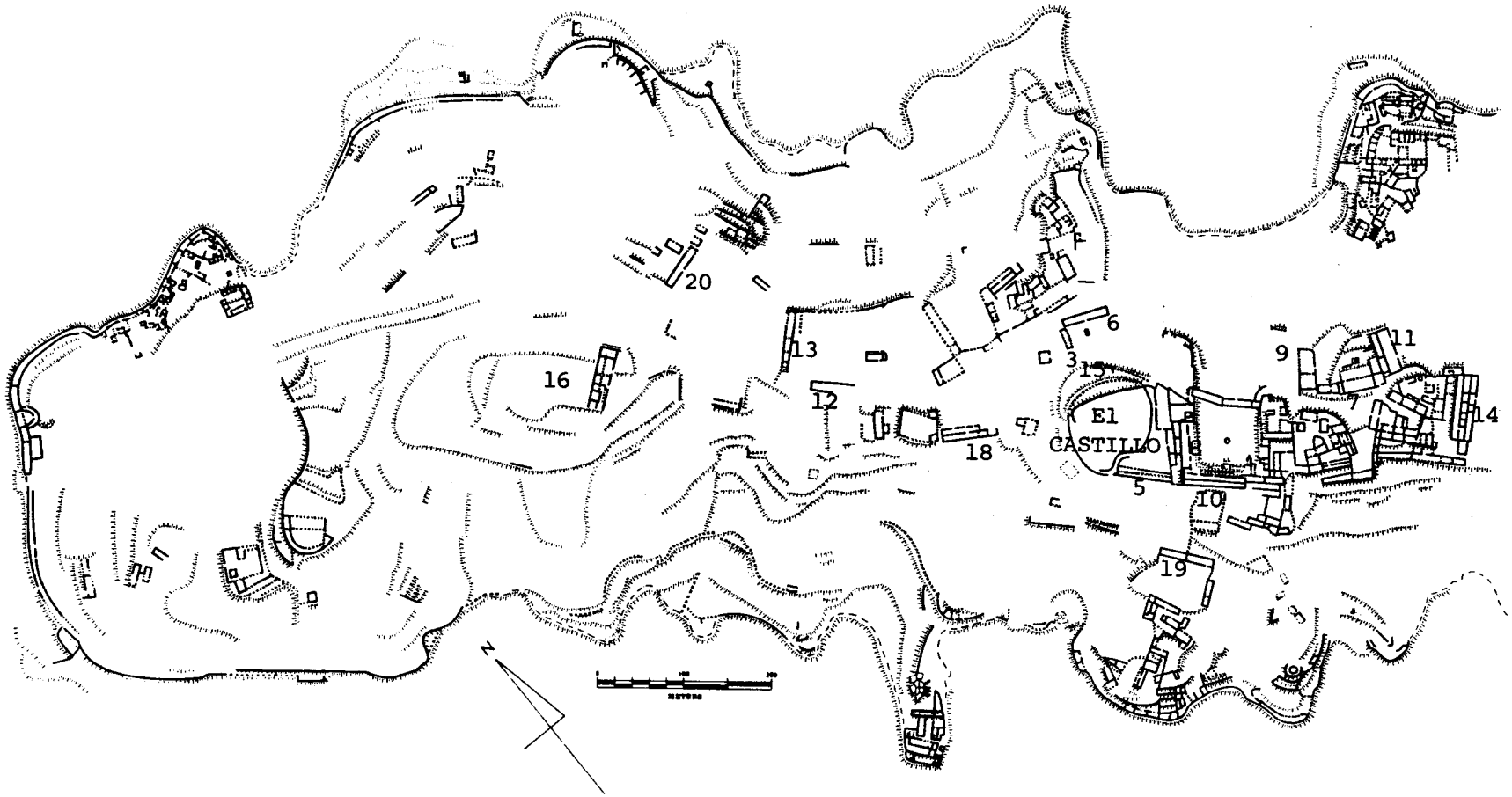

Figure 2. Marcahuamachuco. Cerro del Castillo, Northwest. The numbers of the buildings are keyed to Table 1 and the text. The internal details of the Castillo have been deleted.

and might itself have taken on a more circular form except for topographic constraints. The Cahuadan round "fort" is essentially a circular gallery whose sides have been flattened to the extent that they form four conjoined rectangular galleries surrounding a rectangular patio. This same continuity of ground plans applies to buildings dating to the late Early Intermediate Period and Middle Horizon. The Huamachuco architectural tradition, then, can be defined as a tradition of long, narrow buildings with a variety of ground plans lasting from at least the Early Horizon through the Middle Horizon. In addition, most monumental buildings in the tradition use a characteristic style of masonry which emphasizes numerous chinking stones surrounding larger blocks of stone, and long and short work corners.

The fact that there is such a high degree of synchronic and diachronic continuity in the Huamachuco architectural tradition actually makes it difficult to construct a temporal seriation of the architecture. Obviously, ground plans alone are insufficient, and any seriation must be based on a reconstruction of whole buildings. Moreover, such large buildings encompassing a variety of rooms might very likely be multifunctional; attributes such as room size, numbers of entrances, and, to some extent, ceiling heights, drainage systems, etc. might reflect varying functions of the architecture rather than temporal change. In short, although there is evidence for great time depth in the Huamachuco architectural tradition, it is difficult to identify a discrete functional type of building which is amenable to temporal seriation.

Niched Halls

Niched halls were first recognized at Viracochapampa where they do appear to be a discrete type of building. By analogy to the Inca **kallanka**, this type of building might in some ways be viewed as multifunctional, yet these functions are clearly subsumed under the general category of a large roofed space which housed "public" activities conducted under the auspices of the "state". There are also a number of buildings at Marcahuamachuco which can be tentatively designated niched halls because of the many attributes shared with this class of structure at Viracochapampa.

A general comparison of the salient attributes of the buildings at Marcahuamachuco and Viracochapampa is useful at this point.

1. Large roofed area. At Viracochapampa (Figure 5) the niched halls are as large as 19 x 46 m. and 18 x 48 m., but more commonly they are on the order of 13 x 30 meters. At Marcahuamachuco the largest examples are about 10 x 60 m., but they are often smaller. Significant here are not the actual measurements, which should be considered approximate, but rather the great width of the buildings; most galleries at these sites have widths of about 2.5 to 3 meters. The greater width of the niched halls undoubtedly resulted in difficulty in roofing the building, and implies that an exceptional amount of planning and effort went into their construction and maintenance. This effort was aimed at providing an exceptionally large roofed space without any apparent internal partitions. As a caution, I should note that there is little direct evidence that these structures were roofed, and that this is an assumption based largely on the elaborate internal features.

Table 1. Seriation of niched halls.

Stage	Building Number	Isolated	Short	Plaza grouping	Single doorway	Niches on 2 walls	Niches on 1 wall	Multiple doorways	Stone lintels	Interior raised	L/W (rounded)	Medium	Tomb associated	Front annex	Set on terrace	Mortared lintel	Pole lintels	Grooves	Two stories	Septal wall	Stepped niches	Long	Comments
Early	1	x	x			?	?	x	?		4					?	?						roof drains
	2	x	x		?	?	?	?	?		4					?	?						
	3		x	1	?	?	?	?	?		4		x			?	?						
Transitional	4	x	x		x	x				x?	5												
	5			1?		x?		x	x	x	6	x	?	x?									thin decorative corbels
	6			2		?	?	x	?	x?	7		x			?	?					x	Gallery D (3)
	7			1		x		x			4	x	x		x	x	x						AD 640±85 (1)
	8			1		x		x			4	x	?		x	x		x					AD 780±65 (2)
	9			2		?	?	?	?	½	5	x	x	?	?	?	?		x		x		
Classic	10			2			x	x	x	?	7		?	x	?			x	x	x	x	x	AD 670±65 (2)
	11			3	?		x	?		½	6		x	x			x?	x		?	?	x	AD 495±155 (2), AD 875±60(1)
	12			1		?	x	x	x	?	?	?	?		?	x					x	?	Gallery B (3)
	13			2		?	?	x	?	½	?		?		x	?	?		x		x	?	
	14			?			x	x			6			x			x	x	x	x	x	x	Gall A(3), AD 725±60(1)
	15		?	3		?	?	?	?		?	?	x	?		?	?		x	x	?	?	
	16	?				?	?	?	?		6			x?	x?	?	?	?	3	x	?	x	Gallery G (3)
Late	17	?	x		none			?			2			x?					x	x			
	18	?			none			?			6			x					x		?	x	Gallery F (3)
	19			?	none			x			10			?				x?				x	Gallery E (3)
	20	?			none			?			?	x		x?					x		?		

Notes: (1) date is on wood from a lintel
(2) date is on wood incorporated into the wall hearting
(3) McCown's designation of the building

2. Ceiling height. At both sites normal ceiling height in galleries is about 2.5 to 3 meters. At Viracochapampa the niched halls generally appear to have had ceiling heights in excess of 6 meters. Due to greater destruction at Marcahuamachuco it is not as easy to generalize, but several examples had ceiling heights in excess of 4 meters. The niched halls at both sites are characterized not only by large roofed area, but also by large volumes.

3. Numerous, regularly arranged niches. Niched halls at Viracochapampa particularly deserve the name. All four interior walls are literally covered with a multitude of large and small niches arranged in regular patterns (Figure 5). At Marcahuamachuco niches rarely occur except in the niched halls, where they are not as numerous as at Viracochapampa. Some Marcahuamachuco examples have niches on the interior of both long walls, some only on the rear wall, and some possible "niched halls" lack niches entirely.

4. Plan. Although all niched halls are rectangular, there are some differences in plan. At Viracochapampa the niched halls always have rounded interior corners, but these never occur at Marcahuamachuco. While I cannot be entirely certain, at Viracochapampa there seems to be only one entrance to the niched halls, while at Marcahuamachuco there may be one, two, three, or four "main" entrances located in the front wall.

5. Wall tombs. In a handful of niched halls there is some evidence for wall tombs. The term wall tomb or wall grave seems to have originated with Uhle, who excavated a number of burials which had been placed in the walls at Marcahuamachuco. However, the type of building that these burials were found in was not specified by Uhle. We found a few human bones in looters' holes in the corners of two buildings at Viracochapampa. McCown (1945:237, Figure 9) mentions wall tombs in connection with one niched hall at Marcahuamachuco (Figure 6b), and in a testpit in Gallery G (Figure 2: Building 16) we found a large number of human bones tumbling out of a collapsed wall. The only other occurrence is a surface find in Gallery B (Figure 2: Building 11), but in this case the association of human bones with the building is very tenuous. We have found no evidence, however, that the niches themselves were used for burials (cf. McCown 1945:237). Thus, while there is some reason to believe that wall tombs are associated with niched halls, further work is needed to confirm this association.

In summary, the niched hall at both sites is best defined as a rectangular building encompassing a large roofed volume and exhibiting a regular pattern of niches on one or more interior walls.

A Sequence of Niched Halls

There are a number of reasons to attempt to construct a sequence of niched halls at Marcahuamachuco now even though the present data is based only on surface survey of structures which vary greatly in their state of preservation. First, there is some *a priori* reason to believe that construction of these buildings took place over a considerable length of time. One possible niched hall at Marcahuamachuco has distinctive roof drains (Figure 4: Building 1; Figure 6a). These drains are a rare attribute in preserved architecture and appear, generally, to be early. Radiocarbon dates from a curvilinear gallery with roof drains on Cerro Viejo indicate an EIP date (A.D. 405±60 and A.D.

Figure 3. Marcahuamachuco. Cerro de las Monjas and Cerro de los Corrales. The numbered building is the only niched hall in this area.

405±95) (Topic and Topic 1983). Similarly, roof drains occur in an EIP context at the site of Cerro Sazón in the building illustrated by McCown (1945: Figure 4) where we obtained a date of A.D. 420±110 (Topic and Topic 1983) and in two other buildings. Another niched hall (Figure 2: Building 5) has thin decorative corbels high on the exterior of two walls. Again, this is a rare attribute which, as far as I know, only also occurs on the exterior of one section of what McCown (1945: Figure 6 between point D and the spring) called the double defensive wall. Dates from this immediate area place the construction and primary occupation in the late EIP (Topic and Topic 1983: A.D. 430±60; A.D. 495±65; A.D. 505±60). Dates on construction materials from niched halls themselves fall, for the most part, in the Middle Horizon (Table 1). The radiocarbon evidence alone suggests a time span of 300 to 500 years, depending on how it is interpreted.

The second reason to attempt a sequence now is specifically to order the Middle Horizon niched halls more precisely in time. These are the only niched halls at Marcahuamachuco which incorporate wood as an architectural element. While the radiocarbon dates on this wood cluster in the Middle Horizon, the dates on their own make little sense in developmental terms. Moreover, in the one case where we have two dates from the same building, there is a great discrepancy between the dates. Even when that one case is ignored, the dates on architectural wood from four other buildings with distinct attributes overlap at the level of confidence of one standard deviation. The assumption is that an architectural seriation, anchored at the early end of the sequence by a series of dates on buildings with roof drains and crosstied in the middle of the sequence to a brief (Topic n.d.) episode of construction at Viracochapampa, will be able to chronologically order the niched halls at Marcahuamachuco more precisely than the available radiocarbon dates.

The other reasons for attempting a sequence now revolve around the importance of the buildings. They were obviously of intrinsic importance to the inhabitants of the site, and the radiocarbon evidence suggests that they are also of historic importance to Huari and Inca architecture. Because of their importance we are planning future excavations in these buildings and it is useful to have a working hypothesis about their development.

Attributes

The 21 attributes chosen for study (Table 1) are those which seem to have some chronological significance and can be seen on the surface in more than one example.

Two attributes, isolated and plaza grouping, refer to the context of the building, whether it occurs as one of several niched halls grouped around a plaza, or whether it is isolated from other niched halls. There is some indication that the niched halls on a plaza were not all constructed at the same time and therefore the first niched hall built on any plaza can be considered an isolated building.

Three attributes--short, medium, and long--refer to the approximate length of the building. Short buildings are 12 to 30 m. long, and long buildings have lengths in excess of 50 meters. Exterior dimensions are used here. Some

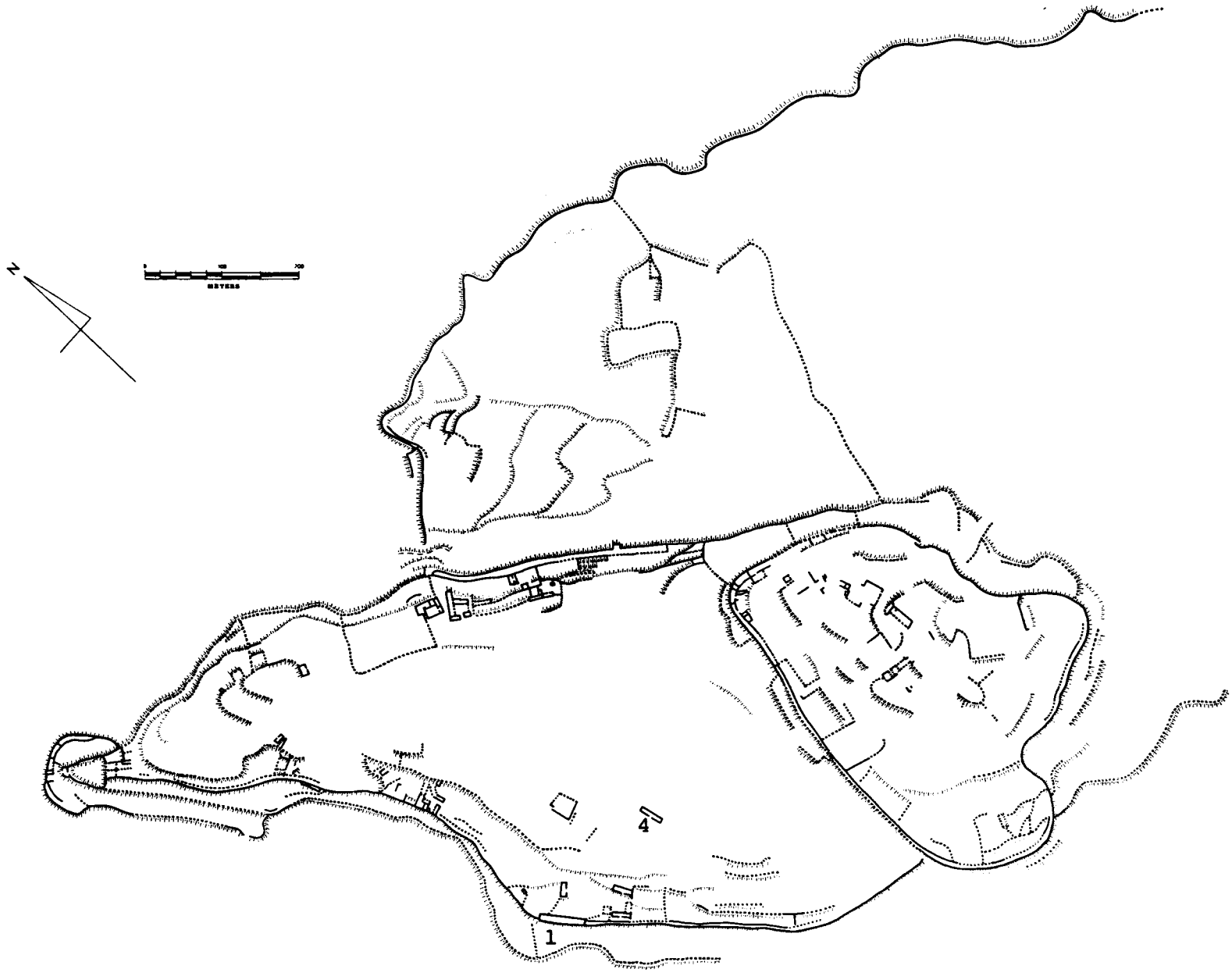

Figure 4. Marcahuamachuco. Cerro Viejo. The numbers of the buildings are keyed to Table 1 and the text.

buildings have been measured, others only paced, and some measurements were taken off of either McCown's maps or our preliminary base maps.

Another attribute is the length to width ratio. Some buildings are multi-storied, with the "hall" itself on the second story and an extra single-story annex on the front of the building (cf. Figure 6c). In these cases, the length to width ratio is based on the exterior dimensions of the "hall" itself, and not the whole building. The ratio is rounded to the nearest integer. Widths of different buildings were determined in the same ways as the length.

The number of doorways refers only to entrances into the hall. It appears that halls can have from one to four entrances, and these are invariably in one long wall of the building. The wall which has the entrance(s) is considered the front wall and, where the building is located on a plaza, faces the plaza. Because of the difficulty of determining the absolute number of doorways in many examples, only two attributes are included on the table--single doorway and multiple doorways. The absolute number of doors may be useful, after excavation, to refine the sequence.

The spacing and size of niches, which are quite variable, may also be useful to refine the sequence at a later date. Here only five attributes relating to the niches are included. Two attributes describe niche position; niches on one wall are invariably on the back wall, while niches on two walls are always on the front and back walls. Three attributes refer to the method of constructing the lintel of the niches. The lintels are sometimes poles or stone slabs which span the width of the niche, and in some cases smaller stones which do not span the entire width of the niche and are held in place only by mud mortar.

Some halls were elevated above the surrounding ground level. One method of doing this is to raise the interior level of the building by filling in. Another method is to set the entire building on a terrace which is larger than the building itself. A third method is to construct the hall itself on the second or, in the case of Gallery G, the third story of the building. These methods are sometimes used in combinations. Moreover, in the case of multistoried buildings, a one (or two) story septal wall often runs under the longitudinal axis of the hall floor to provide extra support. Multistoried buildings may also have a single story annex on the front (Figure 6c).

In two plaza groups, the Gallery B and Gallery D groups, there seem to be small above-ground masonry tombs in the plaza (McCown 1945:233-234, 239). There is a construction in the Great Plaza which McCown (1945:238) originally thought might be a similar tomb, but his excavations did not confirm that suspicion. Other possible tomb structures may occur near Buildings 5, 12, and 13.

"Grooves" can occur on either the interior or exterior faces of the walls, and at varying heights above the ground. They run horizontally along the wall face, are usually about 5 cm. wide and 5 cm. deep, and up to 4 m. long. They appear to be places where the small chinking stones between large blocks have been removed. Confirmed grooves have been found in only four buildings, and in three of these buildings we have also found wooden poles in the wall hearting as a binder. A possible explanation for the grooves then is that with age and the weight of the wall, the poles were flattened and this wall settling forced out some chinking stones on the wall face.

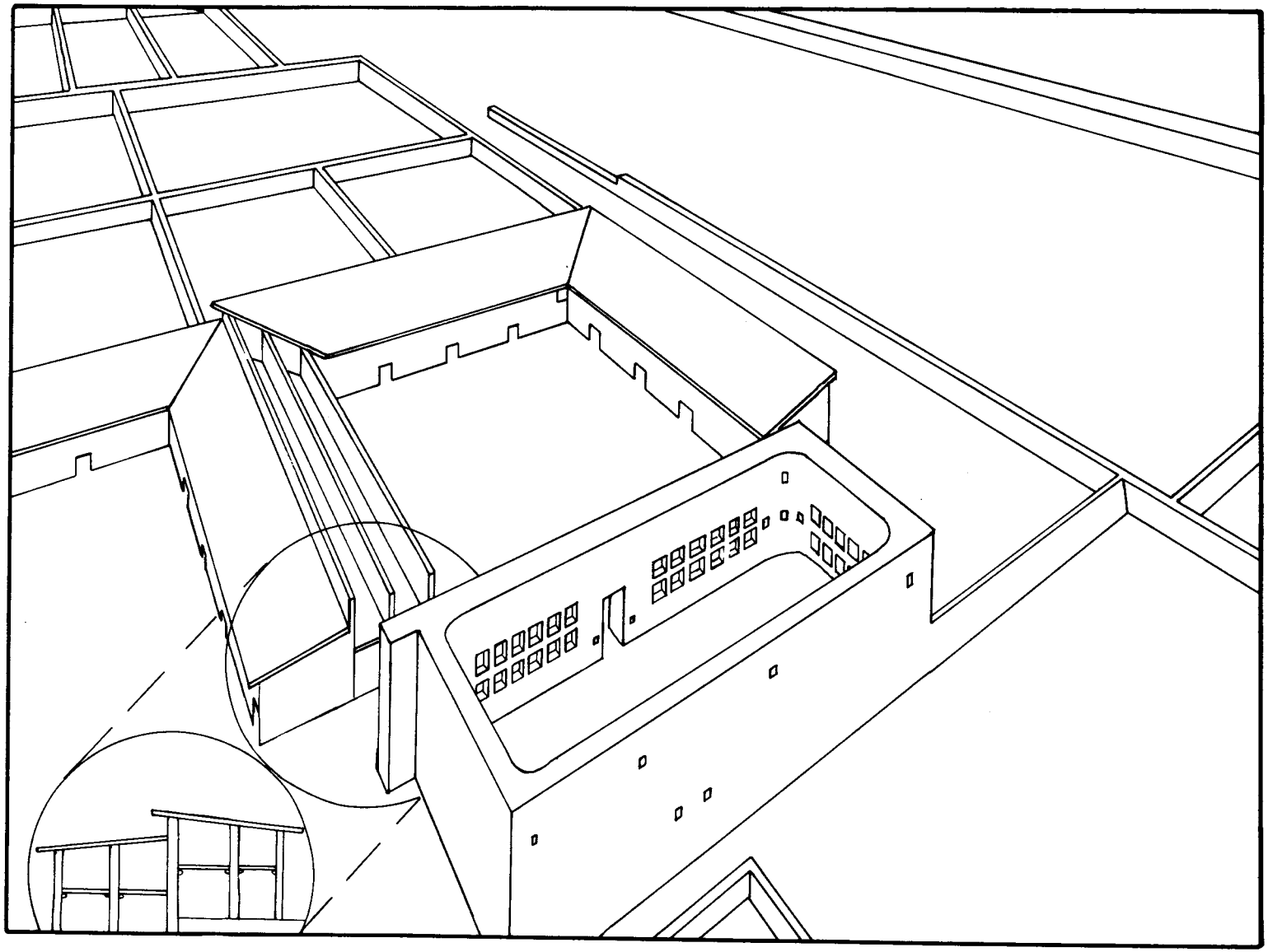

Figure 5. Viracochapampa. Reconstruction of a niched hall and gallery patio group.

The final attribute is presence/absence of a special kind of ornamental niche found on the exterior face of the front walls of some structures. I call this a stepped niche (Figure 6c) and the orientation of the diagonal "stepped" side of the niche is always to the centerline of the front wall.

The Sample

For this study I have selected 20 niched halls from Marcahuamachuco. These have been selected either because they are relatively well preserved or because they possess one or more attributes which allow them to be placed in relative temporal position in the seriation. These 20 examples are undoubtedly not the complete inventory of niched halls at the site. Conversely, until further excavations are conducted it is not possible to affirm that each of these is in fact a niched hall in any functional sense. The 20 examples can be roughly classified into an Early group, a Transitional group, a Classic group, and a Late group.

The Early group is represented by three poorly preserved examples. Example 1 (Figures 4 and 6a) is the most interesting. Its exterior measurements are about 8 x 26 m. and the ceiling height is in excess of 1.8 meters. The interior is now filled with rock rubble, so that the presence of niches cannot be confirmed. The roof was supported by corbels located on the interior face of both long walls, and was almost flat. The roof was surrounded by a parapet wall at least a meter in height, and was drained by means of slits about 3 m. apart, constructed in the front wall. Wall fall patterns suggest three symmetrically arranged doorways. The other two examples (Figures 2 and 3) in the group are about 7 x 30 m. and destroyed to the foundations.

There are six examples in the Transitional group. Building 4 (Figure 4) measures about 5 x 27 m. and the interior may be raised by the addition of almost 1 m. of fill. Walls are preserved to about 3 m. in height. Niches (45 cm. tall, 35 cm. wide, and 3 m. apart) are located on both the front and back walls.

Building 5 (Figure 2; cf. McCown 1945: 236-237 and Figure 9) is very complicated and the temporal relationship to the Castillo is not clear. The foundation of Building 5 abuts the Castillo, while the upper part of the wall is abutted by the Castillo. Either two different phases of construction are represented or there is substantial contemporaneity. The walls of Building 5 stand almost 9 m. tall in places, but at least 3 m. of deposit has accumulated within the building. The upper parts of the walls are poorly preserved but there are both niches and windows in preserved sections of the back wall and at least one niche in the front wall. There is a room appended on to the front of the hall, but unlike the Classic examples, both the hall and the annex are at the same level here. There is a possible tomb structure in front of the building at a lower elevation. A nearby building may also be a niched hall, hence the attribute "plaza grouping" is tentatively included. Building 5 measures about 8 x 48 meters.

Building 6 (Figure 2) is also referred to as Gallery D. It measures about 7 x 50 m. and is poorly preserved. The interior may be raised, or the slightly higher elevation there now may be due to wall fall. There are possibly four

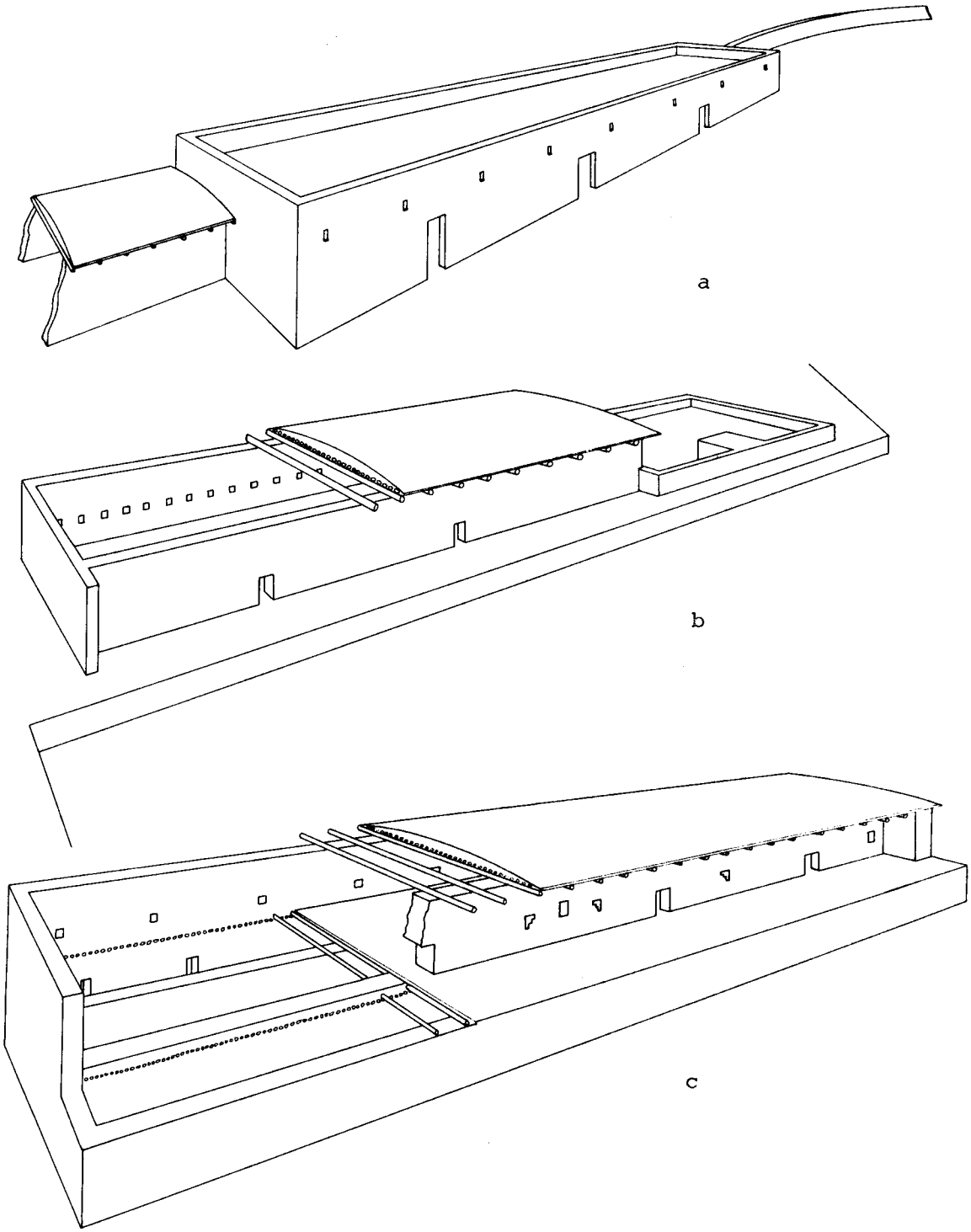

Figure 6. Reconstruction of three niched halls at Marcahuamachuco.

doorways in the front wall. Due to poor preservation, the presence of niches could not be confirmed.

Building 7 (Figure 2) is about 12 x 42 m. and set on a terrace. The back wall is fairly well preserved, with a good set of niches (85 cm. tall, 65 cm. wide, and 1.5 m. apart). The front wall is less well preserved, but there are probably two doorways, one possible niche on the interior face, and one niche on the exterior face. Most niches have mortared lintels, but two have pole lintels. The ceiling height was in excess of 4.5 meters.

Building 8 (Figure 2 and Figure 6b) measures 10 x 38 m. and fronts onto the Great Plaza. It is set on a terrace, has a ceiling height of about 6 m., and grooves are present. The niches in the back wall (55 cm. tall, 80 cm. wide, and 2.25 m. apart) all had mortared lintels. The front wall is less well preserved, but at least one niche was found on the interior face and there were probably two or more doorways.

Building 9 (Figure 2) is the last structure in the Transitional group and the first multistoried building. The building runs up and down a slope, and the upslope part of the building has been filled in. Only the downslope part has two stories, the first having a ceiling height of about 1.7 m. and the second a height in excess of 3 meters. The surface of the fill in the upper part of the building is at the same level as the floor of the second story. The second story is so poorly preserved that no observations about niches and doorways can be made. The building measures about 8 x 45 meters.

The Classic group is represented by seven examples, most of which can be characterized as long, two story buildings with a single story septal wall and stepped niches on the exterior face of the front wall. Building 10 (Figure 2) is located on the Great Plaza and measures about 8 x 55 meters. Niches (about 70 x 70 cm., 2 to 3 m. apart) were found only on the back wall. There is a single story annex in front of the hall, and this appears to have been filled in. There is also some evidence from the exterior of the back of the building that it was set on a terrace. The ceiling height of the hall was in excess of 6 meters.

Building 11 (Figure 2) is also referred to as Gallery B. It measures about 9 x 50 m., with ceiling heights of about 3 m. on the first floor and more than 5 m. on the second. It is poorly preserved, which accounts for many of the question marks on Table 1, but I cannot see the septal wall noted by McCown (1945: Figure 8 and 233). Also, as in Building 9, the upslope part of Gallery B is not two storied, but rather filled in to the height of the second floor. Only part of one niche is presently preserved, and lintel type is not known; pole lintels occur in the first story doorways. McCown (1945:233) felt that the front annex was a later addition. I noted that corbels (to support the roof of the front annex) were incorporated into the exterior face of the front wall of the hall, and believe that this indicates that an annex was part of the original plan. In short, the placement of Gallery B in the sequence is tentative.

Also tentative is the placement of Buildings 12 and 13. They are placed in the Classic group essentially because of the presence of stepped niches, but are poorly preserved. They are either of medium or long length, and fairly narrow (about 7 m.). Building 12 has niches on the back wall (47 x 47 cm., 3 m. apart) and at least one stepped niche and one rectangular niche on the exterior face of the front wall. The interior niches have stone lintels while the exterior

rectangular niche has a mortared lintel. There were probably two doorways in the front wall. Building 13, like Building 9, is partly two story and partly filled in to the height of the second story. Ceiling height on the first floor was about 2 meters. while the second floor had a height of at least 3.5 meters. There is, however, no septal wall. There is a definite terrace, almost like a front annex, on the front of the hall, and this is as much as 2 m. high. There were probably two doorways, and two stepped niches on the front wall.

Building 14 (Figures 2 and 6c) is better known as Gallery A. It measures about 10 x 60 m., with a first floor height of over 3 m. and a second floor height of more than 4 meters. The niches are about 75 cm. on a side and spaced 5 m. apart. Figure 6c provides information about the distribution of other attributes.

Building 15 is largely destroyed; it was probably about 6 m. wide. Building 16 (Gallery G) was obviously at one time a very impressive structure, but it was filled in and reoccupied later. The reoccupation obscures many features, and probably contributed to the destruction of the upper portion of the walls. McCown excavated two pits in the Gallery and we placed a small probe in the extreme NE corner. The probe revealed that, at least at this end, the gallery was three stories tall. The first story was 2.8 m. tall, while the second was 2 m. tall; the height of the hall on the third story is unknown. The first and second stories were subdivided into a series of cells by masonry walls. Human bones found in this probe seemed to be falling out of the front wall at the height of the second story. A number of doorways are known to exist, but in most cases it is difficult to determine whether they give access to the first, second, or third story. There are some corbels suggesting an annex on the exterior of the front wall but the ground level in front of the gallery would also be consistent with a terrace. Few details are known about the destroyed third story hall, or about the general context in which the gallery was situated.

The Late group consists of four examples, and all appear to lack niches. Building 17 (Figure 1) is about 10 x 22 meters. The only certain doorway is on the side facing Gallery A. The building has a septal wall, but curiously corbels are found only on the front wall, not both front and back walls. There is a possible front annex. It is not clear whether this building was part of a plaza grouping.

Building 18 (Gallery F) measures about 8 x 50 meters. It is two stories tall, but lacks a septal wall. The first story is about 3 m. tall, while the second is more than 2 meters. There is a front annex, but it is clearly a very late addition. The front wall is very destroyed, which might imply the presence of multiple doorways.

Building 19 (Gallery E) was probably part of a plaza grouping of niched halls. It measures about 5 x 50 meters. Again, it is two stories tall but there is no septal wall and no corbels on the back wall. The first story is about 2 m. high, while the second story hall would have been more than 4.5 m. high. Wall fall suggests that there were four doorways into this hall on the second story. There is no front annex, but a series of small "windows" perforate the front wall just above corbel height, and these might have allowed beams to pass right through the wall. These beams could serve to support the floor of the hall as well as the floor of a porch or balcony on the front of the building.

Building 20 is about 6 m. wide, and the length is unknown. Again, it is a two story building, without a septal wall but with corbels on both the front and back walls. There is also a row of corbels on the exterior of the front wall, suggesting an annex or porch. The second story is not well preserved, so that lack of niches and the number of doors cannot be confirmed.

Development of Themes

While poor preservation and the real possibility that not all variation is chronological dictate that the placement of any individual building within the seriation be considered with some skepticism, there are a number of themes which unfold through the sequence and provide some security in the placement of clusters of attributes.

The length of the buildings generally increases through time until the Late group, when there is no consistent trend. When the length to width ratio is also considered, the trend in the Transitional phase is particularly interesting. All buildings are broader than normal rectangular, curvilinear, or circular galleries, indicating that even in the Early group special efforts were made to secure long roof beams, a distinguishing characteristic of this class of building. The early examples of the Transitional group become proportionately narrow, but this narrowness is due not to a reduction in width, but rather to a large increase in the length of the buildings. The late examples in the Transitional group become broad, similar in proportion to the Early group, but without any reduction in length. Indeed, some of these examples are among the widest roofed spaces known to have been constructed in Huamachuco. The Classic group is still, on the whole, characterized by great width, but they are also proportionately narrower as the length increases. The Late group tends toward absolute decrease in width, and perhaps signals a decline in the ability to secure long, heavy roofing beams.

A similar trend is seen in the theme of elevation. Examples in the Early group are not elevated. Those in the Transitional group are first filled in and then set on terraces and finally gradually become multistoried. Most examples in the Classic group are clearly multistoried with a septal wall to support the wide floor of the hall and a front annex. The whole appears to be a large hall set on a hollow terrace. Undoubtedly, the ground floors of these structures housed activities intimately related to the functioning of the halls; either the activities housed on the ground floor had been spatially separate before, had been housed in the hall itself, or were newly evolved. The Late group was probably multistoried, and may have attempted to maintain some sort of front annex or porch; as a group, however, they display strange and not very suitable methods of supporting the floor of the hall itself.

The earliest examples of niched halls at Marcahuamachuco suggest that the form evolved out of the curvilinear perimeter gallery. Briefly, during the late Early group and early Transitional group, these buildings were truly isolated and separated from other building complexes. Many examples of the Transitional group and most examples of the Classic group were located around a plaza, associated with a tomb and other niched halls. Most of these buildings are also clustered around the Castillo. Although all the Late examples are still located on Cerro del Castillo, they occupy peripheral locations *vis-a-vis* the Castillo

itself, lack tomb associations, and have not yet clearly been shown to be associated with other niched halls.

Finally, I have already commented that niches are not common features in the Huamachuco architectural tradition, and they are of limited help in ordering the sequence of niched halls at Marcahuamachuco. I cannot yet confirm the presence of niches in the Early group. The Transitional group may be characterized by niches on two walls. The Classic group may be characterized by niches on only the back wall. The Late group seems to lack niches altogether. There are only six cases where we have good information on the sizes and spacing of the niches. The first case, Building 4, has small niches which are widely spaced. Building 7 has both larger niches and closer spacing. Buildings 8 and 10 still have the larger niches, but the spacing increases. Buildings 12 and 13 have large spaces between the niches and Building 12 has rather small niches. Niche lintels develop from single stone slabs, to several stones mortared in place, and finally to poles.

Overall, the development of themes helps to tie together the different groups, define clusters of attributes of probable chronological significance, and suggest an overall developmental process. In terms of process, it can be suggested that niched halls developed out of curvilinear perimeter galleries to become a recognizably separate building type. This development was associated with the concept of elevation. The classic forms were of extreme importance and more truly multifunctional, while the late forms reflect a general decline.

Comparison to Other Sites

Comparisons can be made in some detail to similar buildings at Viracochapampa and Cerro Sazón, while comparisons to other Huari sites and to Inca **kallankas** are best kept at a very general level.

The salient characteristics of niched halls at Viracochapampa are exceptional width, fanatic emphasis on niches, and construction in the Huari, not the Huamachuco masonry style. One notable attribute of the Huari masonry style is the use of mortared lintels. Most niched halls at Viracochapampa occur in patio groupings, and are associated not with other niched halls but with galleries which are probably most equivalent to the curvilinear form. Niched halls also occur, however, on either side of the Great Plaza and in isolated courts. This combination of attributes and contexts fits best with the late Transitional niched halls such as Buildings 7 and 8 at Marcahuamachuco, when mortared lintels were in vogue, niches are emphasized more than usual, the length/width ratio is similar to the niched halls at Viracochapampa, and the context in which niched halls are found is changing. Another attribute which begins to appear at Marcahuamachuco at this time and then continues through the Classic Group is grooves, and by extension, the incorporation of organic material in the wall as a binder. This attribute does not appear to occur at Viracochapampa, but it does occur at the Huari site of Pikillacta in the Cuzco area (McEwan 1984:148-149) as well as at Huari itself (Lumbreras 1974:162). As far as is now known, Huari ceramic influence in the Huamachuco area is limited to Middle Horizon 1b and it is most likely that Viracochapampa also dates to that period (Thatcher 1975; Topic and Topic 1984; Topic n.d.). An approximate date of A.D. 650-700 for MH 1b is consistent with the dates of Buildings 7 and 8 when standard deviations are taken into consideration.

We don't know very much yet about the internal features of possible niched halls at Pikillacta. It is clear, however, that possible niched halls occur in only two contexts there (McEwan 1984: map 4). In one context they occur on either one side or both sides of a large plaza (his Type E Structure). In the other context they are associated with galleries which are not niched halls (Type B Structures).

Cerro Sazón is a site with architecture in the local Huamachuco tradition located very near to Viracochapampa. Dated buildings indicate that the site was founded in the late EIP and was occupied at least through MH Ib (Topic n.d.). I suspect that the site was originally a roadside installation serving the same transportation route as Viracochapampa, and that during the construction of Viracochapampa it served as the main staging area. After construction of Viracochapampa was stopped, leaving the site abandoned and only partially finished, Cerro Sazón resumed, at least for a while, its earlier function as a roadside installation. At present I can only identify two possible niched halls at the site. Neither of these has been excavated, both are located on the side of the site which overlooks Viracochapampa, and McCown (1945: Plate 14c) has published a clear photograph of one. Each opens onto a plaza or patio, but the type of associated buildings, or even whether there were associated buildings, is not clear. These buildings are clearly multistoried and the niched hall probably occurs on the second story. The front walls are badly ruined, suggesting that they had multiple doorways. Only two niches are surely present, on the back wall of one structure, and these niches are relatively small (55 cm. high and 37 cm. wide), widely spaced (about 3 m.), and have stone slab lintels. No grooves were observed, but the building may have a front annex. Notable is the emphatic emphasis given to the chinking stones, which are often flakes of grey limestone. Also notable is the fact that there is a third story above the hall. The presence of this third story above the hall is unique to Cerro Sazón and may relate to the function of the buildings there; it is possible that it served as storage space. These buildings cannot be fitted securely into the seriation of niched halls at Marcahuamachuco. My feeling, based largely on the fact that these are multistoried structures with possible front annexes, is that they may fit best at the very end of the Transitional group or the very beginning of the Classic group. This would place these buildings immediately after the Viracochapampa examples. An alternative placement would be at the end of the Classic group.

Comparisons with Inca architecture are, of necessity, on a different level. The Inca **kallanka** is typically on the main plaza of the site. This, of course, parallels the location of a few niched halls at both Marcahuamachuco and Viracochapampa. Inca **kallankas**, however, are not known to occur in the other contexts typical of either Marcahuamachuco or Viracochapampa. They have more emphasis on niches than most niched halls at Marcahuamachuco, but also less emphasis on niches than is present at Viracochapampa. They also emphasize multiple entrances as much as they emphasize niches. This emphasis is more similar to galleries which are not niched halls at Viracochapampa (Figure 5). In general, in fact, the **kallanka** seem to combine attributes which are typically separate in the Huamachuco area: the long, unified façade and multiple entrances of the gallery, and the width and niches characteristic of the niched halls.

Conclusions

The seriation of niched halls at Marcahuamachuco indicates that this type of building was constructed from approximately A.D. 400 to at least A.D. 800 and probably longer. It may originally have derived from special rooms within curvilinear galleries. It was a common form and occurred within a variety of contexts.

During the construction of Viracochapampa, Huari adopted the niched hall, along with other gallery types. At Viracochapampa, the niched halls were again a common form occurring in a variety of contexts. Although other gallery forms were spread more widely within the Huari sphere of influence, the niched hall is known to occur only at Pikillacta. There the number of contexts in which the halls are found is reduced to two.

If the Inca **kallanka** is derived from the niched halls at Marcahuamachuco, the line of derivation is probably through Pikillacta (McEwan 1984:222-225). The contexts in which the **kallanka** occurs is probably most equivalent to Structure 25-2E at Pikillacta; Inca **kallanka**, however, are much longer and have many more entrances, suggesting that they combined attributes from the niched halls and galleries that they saw in the ruins of Pikillacta.

Earlier I used the **kallanka** as an analogy with reference to the kinds of activities which might have taken place in niched halls. I would not want to place too much stress on that analogy; there was a long time between early niched halls at Marcahuamachuco and Inca buildings, and one perceives a distinct change in the context of the buildings. All are public buildings, but those at Marcahuamachuco probably served more specific publics--smaller groups of people--than the Inca buildings. The Inca buildings, located only on large plazas, have a more institutional character than many of the buildings at Marcahuamachuco, which, located on smaller plazas and often associated with tombs, seem more familial. Viracochapampa, since it represents a brief time period, provides a glimpse of how niched halls might have functioned during the middle of the Marcahuamachuco sequence. There niched halls are ubiquitous; they are associated at times with small patio groupings and probably served specific groups of people, while at other times they occur on the Great Plaza and probably served a more general public.

We can see cross-fertilization between the Huari and Huamachuco architecture in terms of specific attributes such as mortared lintels and incorporation of organic binders in walls. I suspect that this cross-fertilization was more profound and affected the character of niched halls. Early niched halls probably were more familial, while the later, more elaborate niched halls like Galleries A and G might be viewed as more institutional. Still, within the Huamachuco tradition niched halls never became as institutionalized as Huari or Inca buildings.

Acknowledgments

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DUALITY IN PUBLIC ARCHITECTURE IN THE UPPER ZAÑA VALLEY, NORTHERN PERU

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In the course of survey in the Zaña Valley we found several sites whose internal architecture showed a marked dual patterning and others whose spatial relationship to one another on the landscape demonstrated a different, but still dual, configuration. In order to interpret this patterning we have drawn on cases derived from modern ethnographic studies as well as documentation of earlier Andean society by colonial Spanish observers. We have also drawn on the earlier archaeological work of Dillehay in the Chillón Valley of the Central Coast (1976, 1979) and Netherly's interpretation of the organizational principles operative in the North Coast societies of the fifteenth and sixteenth centuries A.D. and their spatial correlations (1977, 1984). In comparing the Zaña data with these other cases, we have been able to identify some of the different kinds of dual patterning which can be found in Andean sites and regional landscapes. This discussion will present the dual patterning we see in the Zaña data and call attention to the diversity possible in such patterning in this valley and elsewhere in the Andes (Figure 1).*

Four centuries ago, the **hanan-hurin** division of Inka society and the quadripartite organization of their realm, Tawantinsuyu (literally the "realm of the four sections"), was noted by Spanish chroniclers and colonial administrators (Polo de Ondegardo [1567] 1916, cap. III; Castro y Ortega Morejón [1558] 1936). Because these divisions were part of a form of social organization very different from the European model, they were accepted without comment or understanding as a single social division without transcendental political, historical, or spatial importance. Those who, like Polo, had learned much about the indigenous system, did not find it necessary to pass this knowledge on to other Europeans.

The failure of the early Spanish observers to deal with the dual organization of Inka society and the Inka state is hardly surprising. European political institutions provided the model against which Andean social and political organization were judged. There was no antecedent in European experience for a state organized around moiety and crossmoiety divisions with political, religious, and economic functions concentrated, not in the hands of a single monarch, but shared by a group of carefully ranked rulers who represented all the structural sections of the society (Zuidema 1964; Duviols 1979; Netherly 1977, 1984, n.d.a., n.d.b.).

New attention was directed toward the moiety system of the Inka by Zuidema (1964), who applied a structuralist analysis to the information offered by early Spanish and Andean observers and asserted that there had been *two*

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* Figures follow text, beginning on page 98.

contemporary rulers in Cuzco--one of the **hanan** and one of the **hurin** moiety--throughout the Inka period. A recent reexamination of the historical sources by Duviols (1979) has provided an independent confirmation of a dual rulership or diarchy in Inka Cuzco.

Netherly has found many organizational similarities between the model of Inka social and political organization presented by Zuidema and supported by Duviols and that of the contemporary society of the North Coast (1977, n.d.a., n.d.b.). The evidence from Spanish colonial written records of the sixteenth and seventeenth centuries for other areas of the Andes suggests that, while there may have been regional variation in institutional organization (division into three or ten parts, for example), there were organizational principles that were pan-Andean, foremost among them a primary dual division (Murra 1968; Zuidema 1964; Netherly 1977, 1984; Dillehay 1976, 1979).

Initially, recognition and understanding of the scope and role of duality in Andean social organization came from contemporary ethnographic studies. In the course of the past 40 years, the dual and in some cases quadripartite organization of communities from all over the Andes has been reported (Arguedas 1964; Fonseca 1981; Houdart-Morizot 1976; Isbell 1978; Ossio 1976; Palomino Flores 1971; Wachtel 1974). This mode of organization is far-reaching. It functions as a means of organizing space within a settlement and across the landscape controlled by that community (Fonseca 1981; Isbell 1978; Ossio 1976; Palomino Flores 1971; Wachtel 1974).

It is even possible to propose the existence of a generalized model of spatial organization for these traditional communities. The territory--pasturelands and cultivated fields--of the whole group is divided into two sections, usually by a river or stream. Each section is occupied by the members of one of the two moieties or else they claim land there. Streams, canals, or other topographic features may further divide the moiety territory into two or more parts, which are held by social subdivisions presently called **ayllu** or **barrios** (Arguedas 1964; Fonseca 1981; Houdart-Morizot 1976; Isbell 1978; Wachtel 1974). Where the cultivated land or pasture is irrigated, rights to the water of the canals irrigating the lands of a particular section (**ayllu** or **barrio**) are vested in it, as is responsibility for its upkeep.

The contemporary use of the Spanish "barrio", literally a residential district in a town, emphasizes the fact that the nucleated settlements--the **reducciones** resulting from Spanish resettlement policies of the sixteenth century--replicate the organizational structure of the society in the location and definition of the residential quarters within them, despite the frequently artificial beginnings of these towns as arbitrary European administrative units.

The pervasiveness and persistence of dual modes for the social organization of human groups in the Andes and the application of this organization to the landscape within which these groups live is indeed remarkable. Considering the pressures to which this organization has been subjected in colonial times and in the nineteenth and twentieth centuries, its survival must be linked with fundamental aspects of the culture. In the Andes, dual and quadripartite organization of the society serves as a mechanism for obtaining access to resources and to human energy, as well as offering protection against risk (Netherly n.d.c.). These are powerful motives for the continuance of the ancient, and efficient, pattern. This pan-Andean mode of organization is reflected in the colonial

records primarily through the political hierarchy, which was embedded within the social organization, and through corporate rights to land and water (Netherly 1977, 1984, n.d.b).

However, there are other modes for the dual ordering of people, relationships, and space in the Andes which can also be seen in both twentieth century and pre-European Andean society. These modes go beyond intra-group organization. Setting up a relationship of dual opposition appears also to be a mechanism for ordering relationships between different groups across space and, we hypothesize, for the sharing of access to different economic resources by potentially competitive groups.

Dillehay found in the Chillón Valley, for example, that the modern settlement of Pucará, which occupies part of the prehistoric site of Pucará Bajo, is made up of two lineages: one from Arahuay, a community on the southern bank of the Rio Arahuay, a southern tributary of the Chillón, and the other from Yaguay, a highland community on the north bank of the same river (1976, n.d.) (Figure 1). The families, members of lineages from these two different ethnic groups, are linked through the women, yet preserve their historic ethnic identities by living on the eastern (Arahuay) and western (Yaguay) sides of the prehistoric wall which divides the Pucará archaeological site and the modern settlement. The wall has stairways on either side to provide access to the other. These, together with the wall itself, are kept up by the residents of both ethnic groups, "for the sake of tradition".

Pucará is a village on a main road to Lima. Why should the inhabitants of this community retain a residence pattern which makes contact between the families of the two ethnic groups inconvenient, but not impossible? By organizing themselves in a mode of dual opposition, these unrelated groups are able to live in proximity *without being incorporated into a larger entity.* Most members of each group are able to retain rights to land in their home territory, while cultivating lands traditionally held by their group in the Chillón valley around Pucará. The archaeological work carried out by Dillehay in 1973 and 1977 shows that this is an ancient pattern in this area (1976, n.d.).

It is clear that, for contemporary Andean society, the various modes of dual organization appear to provide a general pattern from which an array of variations can be derived for the organization of space in social and economic terms. A number of different models of such organization can be recognized in modern ethnographic studies and these can be used in turn as hypotheses for the interpretation of the use of space in the Prehispanic past.

THE ORGANIZATION OF SPACE: REGIONAL LANDSCAPES AND THEIR REPLICATION IN THE CULTURAL TOPOGRAPHY OF INDIVIDUAL SETTLEMENTS

The Evidence from 20th Century Ethnography

Since it is the principles by which Andean peoples organized their society and the world in which they lived which seem to have endured the longest, we will begin with an examination of the persistence of dual and quadripartite divisions within contemporary Andean communities. In traditional Andean communities today the prehistoric lords are long gone but the social groupings persist, named or unnamed, because it is through them that individuals obtain

fundamental economic rights to land and water, organize their religious observances, and in general act as social beings. Water, particularly flowing water in rivers, streams, or irrigation canals, frequently is used as a dividing median (Netherly 1984). Sometimes a dry watercourse or an abandoned canal forms the median line, preserving the association with water, however tenuous. Water is so important that its sources are considered sacred (Arguedas 1964; Isbell 1978). Thus, to the Andean mind, upstream groups rank higher than downstream groups.

The community of Cuenca in the Central Andes was studied by Marie-France Houdart-Morizot (1976) and is a remnant of a larger colonial and Prehispanic polity which once had four divisions (Figure 2A). We can see that the river here forms a boundary today. The upstream territory is called Marca and corresponds to a social group called Wanaco. It is separated from the downstream lands called Wansawchi of a group called Qollana. The division between the two sets of lands originates in the town, and is called Tikray in the agricultural zone. Within the town it is formed by the street called Azangaro or **Chaupi**. The name Chaupi means "middle". Again, within the town the higher-ranking Wanaco are upstream relative to the second moiety, Qollana (Figure 2B). There is a point to make here. **Qollana** is a Quechua term which usually refers to the most preeminent group of several. It appears that in Inka times this was the highest-ranking group because of the presence of Inka **mitmaq** groups in Cuenca, which were incorporated into Qollana. The reversal in rank and presumably a reordering of territory occurred when the indigenous groups (Marca, Wanaco) recovered their ancient hegemony on the departure of the Inka settlers after the arrival of the Europeans.

In the community of Andamarca in the Central Andean highlands, Juan Ossio (1976) found that the territory of Andamarca was divided into two parts two different ways (Figure 3A). The river divided the territory into left and right banks, which the people of Andamarca called **valle** and **puna**. There was also an upstream/downstream division which was called Hanan (upper) and Uray (lower). The village of Andamarca was located in both **valle** and Hanan sections, that is, in the highest-ranking sector of Andamarca. The corresponding settlement of Chiricre, while located upstream is on the lower-ranking **puna** side of the river.

When we look at the organization of space in the town of Andamarca itself, we see that the high-low designation is preserved with **Tuna** ranking higher over **Pata**, which is lower land nearer the river (Figure 3B). The social group Qarmenqa is upstream relative to Antara and thus ranks higher. Note the position of the plaza and the street called Lima or Chaupis which is the median line between Tuna and Pata.

In Chipaya in northern Bolivia, Nathan Wachtel (1974) found a dual and quadripartite division where the town of Chipaya was divided into higher-ranking Manasaya and lower-ranking Aransaya, which corresponded to an east-west division: Tuanta-Tajata (Figure 4A). In this town plan as in so many Andean towns, the church, as an outside institution, is the origin of the dividing line between Tuanta and Tajata. The fourfold division is expressed architecturally in the presence of four chapels, one of which is in ruins, which are identified with the groups living in the sector of town which surrounds them. The groups of the higher moiety are called Ushata and Waruta. Those of the lower moiety are called Tuanchajta and Tajachajta. The farmlands of

Chipaya abut on Lake Coipasa and are laid out in long strips (Figure 4B). The eastern territory of Tuanta is separated from the western territory of Tajata by an abandoned canal called Taypi. The internal divisions within the lands of each moiety are also made by canals.

The Evidence from Sixteenth Century Chicama

If we turn now to the regional landscape of the Prehispanic period, we can see the creation of complexes of monumental architecture which appear to correspond to the same principles of organization. The sixteenth century material offered by the Chicama documentation provides written corroboration of the distribution of space described for contemporary communities (Netherly 1977, 1984, n.d.a.).

The map of the Chicama Valley shows the division of this valley between the late Prehispanic polities of Licapa and Chicama (Figure 5). Their territory was divided by a long canal, no longer in existence, which passed to the north of Chocope. Within the polity of Chicama itself, there was a moiety division and subdivision into a total of four sections. The Chicama River divided the lands of the upper moiety from those of the lower.

On the hill to the north of Chocope there is a complex of elite residential and administrative structures which we may assume was associated with the Prehispanic paramount lord of Chicama, just as the **cacique principal** of the mid-sixteenth century was to be found in the Spanish town of Chocope (Figure 6). The lord of the second section of the higher-ranking moiety, Don Alonso Chuchinamo, is the only lord who can be associated from the written evidence with a named group, Cao, and the area called Cao. We located and mapped a elite residential compound at the late Prehispanic site called Cao Viejo in association with one of the four **doctrinas** established by Domingo de Santo Tomás in Chicama (Figure 7). Cao territory was defined by the canal called Cao, which is the only canal remaining in the Chicama Valley bearing the name of an indigenous polity (Netherly 1977, 1984, n.d.a.).

On the south side of the river there is a large elite complex with residential and administrative functions at Chiquitoy Viejo not far from the Spanish town and **doctrina** of Chicama (Figure 5). Finally, there was a large and important settlement near the mouth of the Chicama River on the south bank which has been largely destroyed. The Prehispanic canal system on this side of the river has been greatly modified to serve the sugar haciendas and it is not possible to delimit the territory of the two southern sections of the lower moiety represented by these sites (Netherly 1977, 1984, n.d.a.).

Nevertheless, it would appear that in the Chicama Valley there was a predominance of the north bank over the southern one and of upstream over downstream, which is congruent with both the ethnographic information and with the sixteenth century documentation.

Dillehay found that there were rather well-defined divisions between ethnic groups in the Chillón Valley, particularly in the Middle Valley. In terms of the topography, it was the river and the lateral quebradas which served as the principal boundaries between ethnic groups, influencing the direction of

penetration onto the valley floor by highland groups, and in turn, determining which **yunga** and highland groups could interact with each other (Dillehay n.d.). Highland groups interacted with the **yunga** groups whose land adjoined the quebradas through which they entered the valley.

Dual Patterning on Precolumbian Regional Landscapes

The Peruvian architect and scholar, Carlos Williams León (1978-80), has provided us with the location of four major U-shaped temple complexes in the Lurin Valley just south of the city of Lima, Peru. These complexes correspond to the first millenium BC. Close observation will show that there are two complexes on each bank of the river and that the upstream complexes are architecturally more elaborate than the downstream ones, which are nevertheless impressive. The analogy to the ethnographic model we have just seen is very powerful and would lead us to hypothesize that different groups were responsible for each complex and that the higher-ranking ones correspond to the more elaborate upstream temple complexes. The Valley of Chancay to the north of Lima has also been surveyed by Williams (1978-80, 1980) and there is one of these monumental U-shaped complexes on the south bank of the river and one very large one on the north bank as well. In Figure 8, taken from Williams's 1980 publication, it is evident that there are *four* smaller U-shaped structures on the north bank as well as one monumental one. The difference in scale of the architectural complexes suggests a difference in the size and organizational level of the groups which constructed and used them. Two of the smaller structures are clearly upstream from the others and the large complex might be construed as providing a median line.

A second example comes from our survey in the Middle Zaña Valley (Figure 1). In the course of survey on the north side of the valley, we located two platform mounds on low ridges projecting onto the irrigated valley floor near the village of Macuaco. We designated these mounds Macuaco I and II, since they were separated by less than 500 m. and seemed to be a pair (Figure 9). Test excavations in Macuaco I indicated that the site had been continuously occupied from the Initial Period to the Late Horizon with a discontinuity between the first ceramic occupation and an underlying Preceramic occupation (Dillehay and Netherly 1983; Netherly and Dillehay n.d.; Dillehay and Netherly n.d.a.). The survey collection from Macuaco II indicates the same span of occupation. The long axis of these mounds appears to be oriented some 8 degrees east of north, although excavation and more precise instruments are required to confirm this observation. Opposite these mounds on the south bank of the Zaña River in and to the east of a hamlet called Viru are two larger platform mounds, again separated by some 500 m. and again apparently aligned between 5 and 10 degrees east of north. The ceramics found on these mounds also range from the Initial Period to the Late Horizon.

The placement of these structures and the fact that unlike the situation in many other coastal valleys, they remained in use for over 3,000 years, suggests to us that they were associated with fundamental socio-political divisions on a pattern not dissimilar to that shown by the Early Horizon structures mapped by Carlos Williams in the valleys of the Central Coast. Moreover, as was the case in the examples from the Lurin and Chancay Valleys of the Central Coast presented by Williams, the two upstream platform mounds are larger than those

downstream and the two at Viru seem larger than those at Macuaco. **Huaquero** activity in 1982 revealed high-status Chimu tombs in the upper platform of Macuaco I, which strengthens the socio-political association of these mounds.

DUAL PATTERNING IN THE ORGANIZATION OF PARTICULAR SETTLEMENTS

Division of Settlements on the Median or Chaupi Line

Returning to examples which are close in time to the European arrival in the Andes, let us look first at Tunanmarca, the principal town of one of the Huanca divisions of Jauja in the Central Andes. The pre-Inka settlement is divided into two parts, each of which is completely surrounded by a defensive wall. The two unequal parts of the settlement are separated by a broad corridor which is entirely walled and forms a median or **chaupi** line. At the center there are two plazas with rectangular structures which are architecturally atypical for these Huanca hilltop settlements and which are Inka (LeBlanc 1981; D'Altroy 1981 and personal communication). That the Inka occupation of this settlement should be found on the median line, just as the Catholic Church is in modern Andean settlements, is a reflection of the external nature of this domination. It describes the pattern of Inka occupation at other settlements such as Machaca in northern Bolivia or Chincha, where the two moieties were spatially segregated as well (Albó et al. 1972; Craig Morris, personal communication).

There are two sites in the Chillón Valley which have a wall dividing the settlement and acting as the median or **chaupi** line (Dillehay 1976). The first is Pucará, which consists of two sectors: Pucará Alto and Pucará Bajo (Figure 1). Pucará Bajo is bisected by the modern highway from Canta to Lima and is affected by the modern settlement of Pucará which intrudes on the site. However, the most notable feature is the 2.2 meter high stone wall running north to south and dividing the site into western and eastern sectors. We have already noted the stone stairways which provide access over the wall. Prehispanic nucleated villages of stone structures are found on both sides of the wall. There is an elite compound and a near-by platform mound which abuts the median wall in the western sector. The walling in this sector consists of a well bonded, double-coursed, rubble-filled masonry very like what is found on other sites downvalley. Dillehay also found that the ceramics from this sector of the site resembled those from Huancayo Alto immediately to the west (Figure 1). However, among the ceramics collected from the surface on the eastern side were rimless sherds with highland paste types.

There is no elite/ceremonial complex on the eastern side at Pucará Bajo. However, the dominating architecture at Pucará Alto is a large, stone-faced platform mound with two small rubble-filled mounds behind it to the south. There is also a three-room elite complex. If the wall dividing Pucará Bajo is projected southward, the Pucará Alto complex would lie to the east of it. The masonry at Pucará Alto is singlecoursed and similar to masonry found at Quivi Viejo and sites in the lower Arahuay drainage. On the basis of the ceramics, Dillehay places the occupation span of Pucará Bajo from the Early Intermediate Period to the Late Horizon. Pucará Alto, on the other hand, appears to have been occupied from the Late Middle Horizon through the Late Intermediate Period. No Inca ceramics were found at either site. Dillehay has interpreted Pucará Bajo as a boundary settlement between the Huancayo and Quivi ethnic groups at a point where an important route to the Jicamarca highlands enters

the Chillón Valley, and notes the time depth evident for the occupation of the site.

The other site in this valley with a median wall is Checta, just 1 km. to the east on the same side of the river (Figure 1). There is a large wall running north-south and dividing the site into eastern and western sectors. As at Pucará Bajo, there are stone stairways permitting passage over the wall. There are settlements on either side of the wall but no elite structures or platform mounds. The location of Checta is at a point which controlled passage up and down the valley. The site and its wall abut a large hill to the south. On the other side of the river there is a sheer drop on the mountainside which impedes upstream or downstream movement. Dillehay interprets Checta as being the boundary settlement between the coastal Colli and the highland Canta during the Late Intermediate Period and during the period of Inka domination, the boundary between the Canta and the **mitmaq** from Chacalla who were part of the Yauyos ethnic group from the highlands to the south (Dillehay 1976, 1979).

The **chaupi** or median division at Tunanmarca expressed a moiety division within a single group. The installation associated with Inka domination was placed in the liminal no-man's-land between the walled enclosures of the moieties. The high dividing walls at both Pucará Bajo and Checta express a median dividing distinct ethnic groups. There is no architectural expression of superior authority. Clearly the division at Pucará Bajo was a local one, sanctioned by long occupation and the presence of ethnic authorities and public architecture. The ethnic groups divided at Checta represented larger polities whose political centers lay elsewhere and no architectural expression of local identification in the form of elite architecture or ceremonial complexes is found.

Architectural Expressions of Dual Social and Political Structure

A different instance of Inka occupation of an ethnic polity which expressed the dual social and political division in the architecture of its major settlement is found at Huancayo Alto in the Chillón Valley to the north of Lima (Figure 1). Here there are two elite residential structures of unequal size which date from the pre-Inka period (Figure 10). These structures were used and architecturally modified under Inka occupation in conjunction with the presence upslope, that is to the south, of a large Inka storage complex and, at a short distance, an Inka administrative complex (Dillehay 1976, 1979). In this case both moieties of the Huancayo polity were represented and their lords were clearly involved in the functioning of the Inka center, but cannot be considered representatives of the Inka state.

The dual patterning in the Chillón appears to be a long-standing tradition. It can be traced back to the Early Horizon and may be still more ancient. Dillehay found that the Chavin occupation at Huancayo Alto in the Chillón Valley included an area of residential occupation, an area of storage structures, and a pair of stone-faced mounds lying below the site closer to the river (Figure 11). This complex dated to between 800 and 900 B.C. (Dillehay 1976, 1979). Of the two mounds, the southern one was the larger and had a stone-lined causeway which united it with a group of monoliths. Tests in this mound produced Early Horizon ceramics of local affiliation identical to those found in the storage area. Tests in the second mound produced Chavin ceramics which were external to the south bank of the Chillón, but affiliated with settlements

from the north bank. There are no Early Horizon ceremonial complexes on the north bank of the Chillón. Dillehay concludes that this pair of mounds represents an early Middle Valley north bank/south bank socio-political duality which culminated in Chavin times and was also expressed in the shared storage facility on the south bank.

Turning again to monumental complexes of U-shaped temple architecture of the first millenium BC, we can consider both their internal structure, modalities of dual patterning, and the relationship of such dual complexes to a dual social structure. These relationships, which have been discussed for later periods as well as for the Formative Period, are also found in some Early Intermediate Period sites.

In 1985 the Proyecto Arqueológico Zaña-Niepos located a pair of small Early Intermediate Period mounds surrounded by an extensive area of habitation refuse just outside the hamlet of San José in the Nanchoc Quebrada (Figures 1 and 12). The mounds are low and covered by trees, which impeded accurate mapping. Figure 12 is based on a field sketch and is not to scale. It was clear, however, that the upstream mound, designated Huaca A, is larger than the downstream one. Excavation at this site should clarify the relationship between these two mounds which can only be hinted at here.

Another example, also from the Zaña survey, is the San Luis II complex from the Zaña Valley itself (Figure 13). It was recorded by Dillehay and Netherly in 1978 and mapped as part of the fieldwork carried out in 1985 (Dillehay and Netherly 1983; Netherly and Dillehay n.d.). The complex consists of two U-shaped structures oriented up-river and north of east. It is located on a desert pampa of the north bank of the Zaña River. Unlike the monumental structures mapped by Carlos Williams, here the two mounds are almost equivalent in size and are separated by a distance of some 150 meters. The wall which divides them and the two parallel walls running north-south to the east of the southern structure are all much later and are related to a Late Intermediate Period occupation off the map to the south.

The northern mound has not been subsequently modified and consists of a central structure with platforms and two roughly parallel wings extending north by east. There are two sets of dual entryways, at the entrance to the plaza formed by the wings and at the entry to the base of the central structure. The southern mound is somewehat larger and more elaborate and the extending wings appear to have been larger. The inequality of the wings is a regular feature in this architecture and may be an internal expression of a ranked dual opposition. The more complex architecture shown on the map may involve some late additions, but in any case the structure is larger than the one to the north. What is noteworthy is that this pair of U-shaped mounds is unique on this side of the river and, so far as we have been able to determine, in this part of the valley. One must suppose that only a portion of the population of this area was involved in the communal activities carried out at this pair of public structures and that the duality shown here may reflect the dual organization of that group. Again, the planned excavation of this site should provide more evidence.

Finally, in the light of the pairing of mounds seen in the Zaña Valley and the Nanchoc Quebrada for later periods, we should consider the paired Middle to Late Preceramic mounds at the Cementerio de Nanchoc Site (Dillehay and

Netherly 1983, n.d.a., n.d.b.; Netherly and Dillehay 1985, n.d.). This site lies on both banks of a small seasonal stream which cuts the alluvial fan at the mouth of a lateral quebrada on the north side of the Nanchoc Quebrada valley about 1 km. from the modern town of Nanchoc (Figures 1 and 14). The test and block excavations carried out in 1981 and 1984-5 show that this is a multi-component site characterized by a pair of low, three-tiered mounds faced with aligned stones, which consist of a series of undisturbed architectural fills and living floors. The eastern or upstream mound appears to be the larger, but it has been heavily disturbed by the the modern cemetery. The western mound measures some 35 m. in length and ranges from 1 m. to 1.5 m. in height. There are dual entrances to the lowest platform of the western mound. It was not possible to determine whether they were repeated between the first and second platform levels. There is an associated processing area across the gully from the mounds where plant-processing, wood-working, and the manufacture of lime from calcite were carried out. Given the absence of domestic refuse, the type of artifacts recovered, and the presence of platform mound architecture, it is clear that this site was a public precinct where lime was extracted and wood processed. We hypothesize that the processed lime was used with coca, but as yet we have no direct evidence for the presence of coca at the site. In the light of the examples which have been presented here, however, we are more confident in suggesting that even at this early date the presence of *two* mounds is related to forms of dual organization which regulated the structure of the society.

DISCUSSION

Dual organization is very common throughout North and South America. This is well-known to ethnologists and has been for a long time. However, for the most part, archaeologists working in the Andean region of South America have not used this division as a paradigm in research design. Our purpose in presenting the ethnographic and archaeological examples given above has been to bring this fundamental organizational principal of Precolumbian Andean society to the attention of archaeologists working in this region and to demonstrate the powerful continuities between the ethnographic, ethnohistorical, and archaeological evidence. We have limited our presentation to only a few of the possible Prehispanic uses of duality as an organizing principle in the economic as well as socio-political spheres and have not attempted to deal with the use of this principle to organize cosmological or politico-religious relationships.

The most important conclusion that emerges from the material presented here is that these same mechanisms were used to organize space, to domesticate as it were the vast expanses of the Andean landscape on the regional level, to organize groups within the context of a particular site, and to express relationships within the context of a particular archaeological complex. Although we have not emphasized this aspect of Andean duality, it is well to remember that for Andean peoples space has symbolic meaning and that a prehistoric Andean regional landscape, a particular settlement, or a particular structure all represent *symbolically organized* space as well as a series of more pragmatic relationships. Andean dualism, as ethnologists are well aware, is tempered by a concept of intermediate space and intermediate status called **chaupi**. We have seen its direct expression in the walls dividing the Pucará Bajo and Checta settlements in the Chillón Valley, and perhaps also in the late wall which

divides the two ceremonial structures at San Luis II in the Zaña Valley. It is also seen in the use of the river to divide a regional organization of space as indicated by Carlos Williams's settlement pattern data from the Lurin and Chancay Valleys and by the organization of the Viru and Macuaco platform mounds from our own research in the Zaña Valley. The construction of paired structures, whether public in function as the paired mounds at Cementerio de Nanchoc and San José in the Nanchoc Quebrada or the paired Early Horizon structures at Huancayo Alto, or socio-political as the elite residential buildings at Huancayo Alto, force us to look at intra-site organization differently than has been done heretofore. The evidence from the reconstruction of the organization of North Coast irrigation and the field survey from the Chillón Valley both suggest, as do the ethnographic accounts, that it is possible to reconstruct the core *territory* of many prehistoric Andean polities and ethnic groups as well as to demonstrate the presence of more than one hierarchical level with considerably more sophistication than has been possible in the past.

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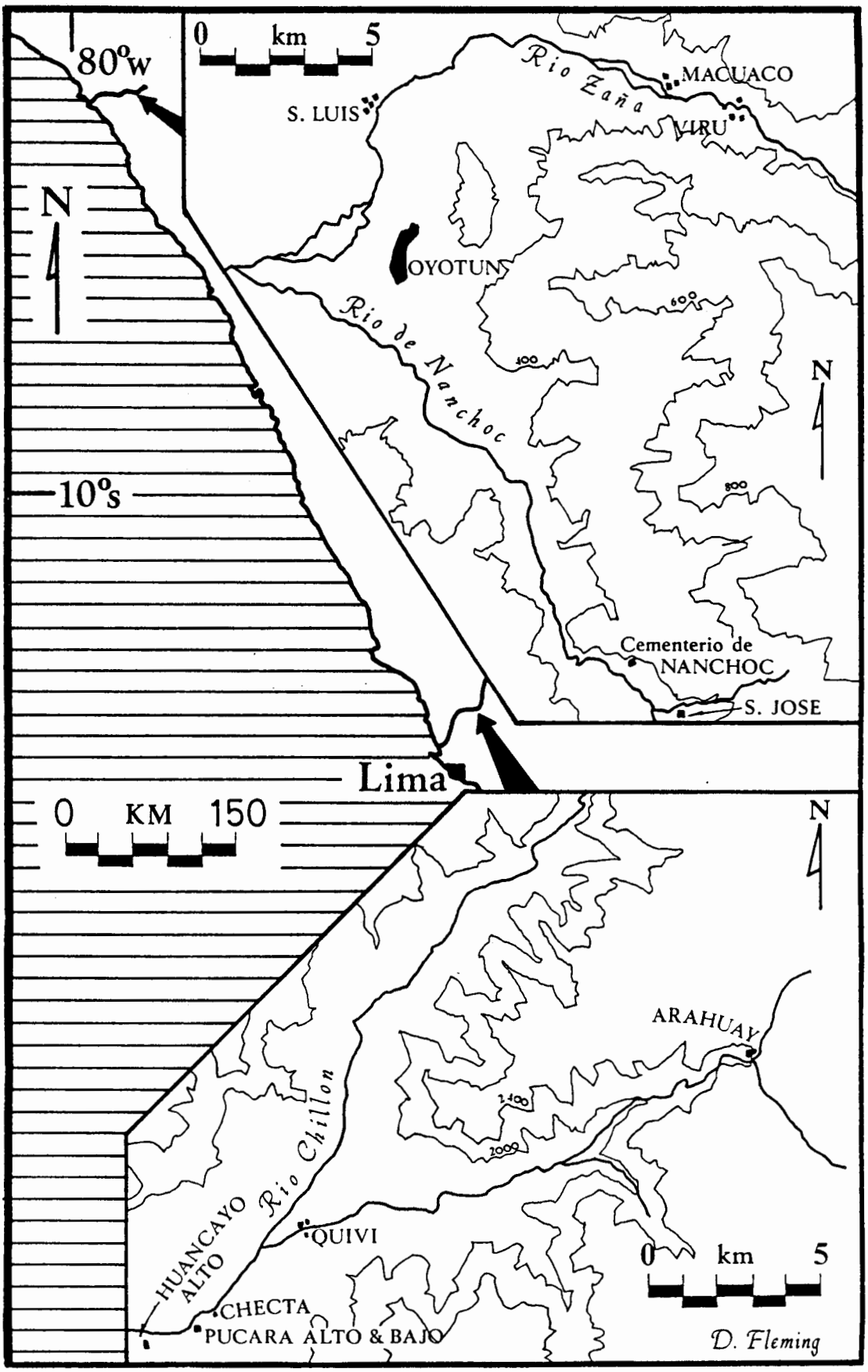

Figure 1. Map of Peru with insets of Zaña and Chillon valleys, showing principal sites mentioned in the text.

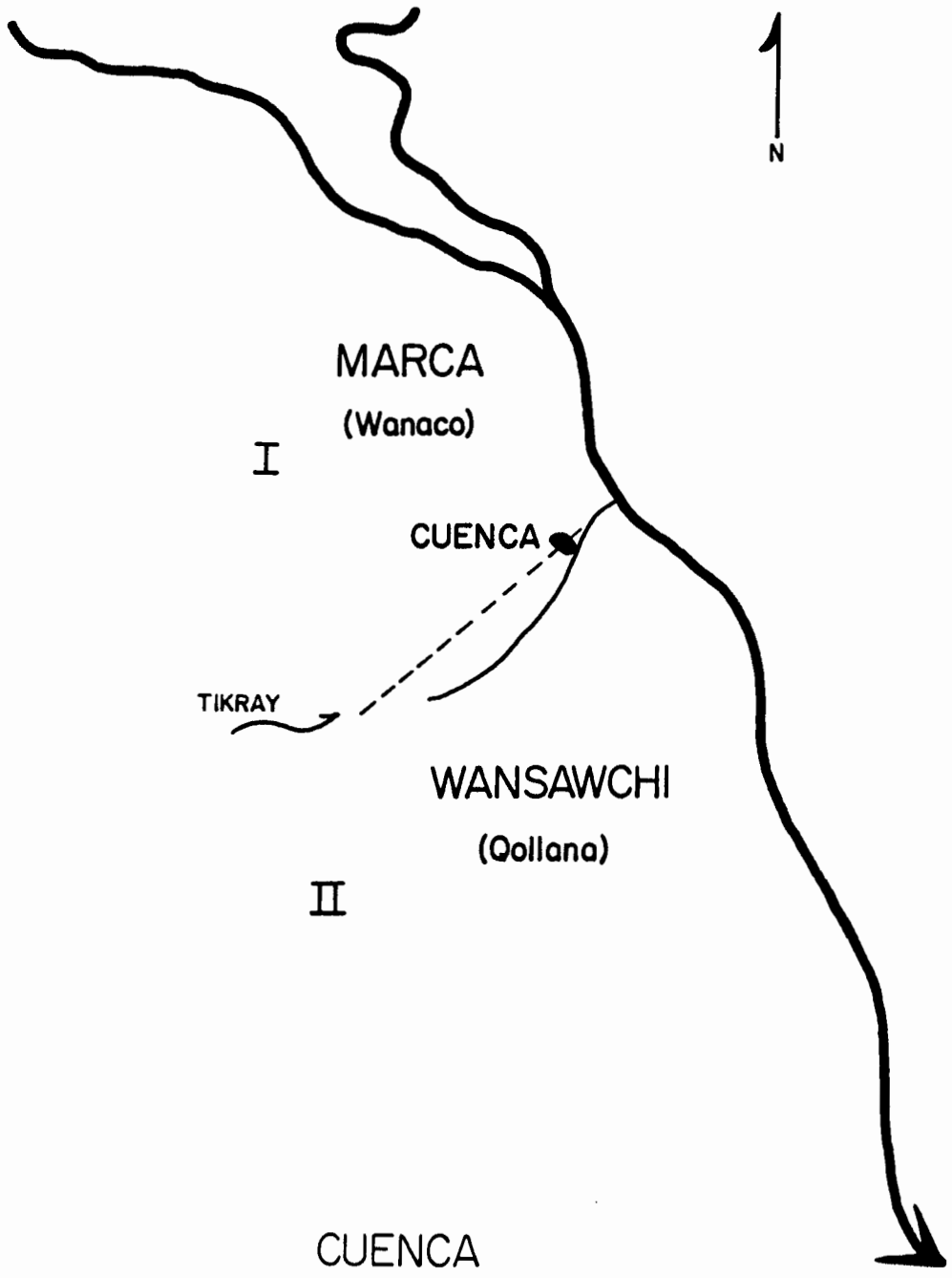

Figure 2A. Divisions in the rural territory of Cuenca. After Houdart-Morizot 1976.

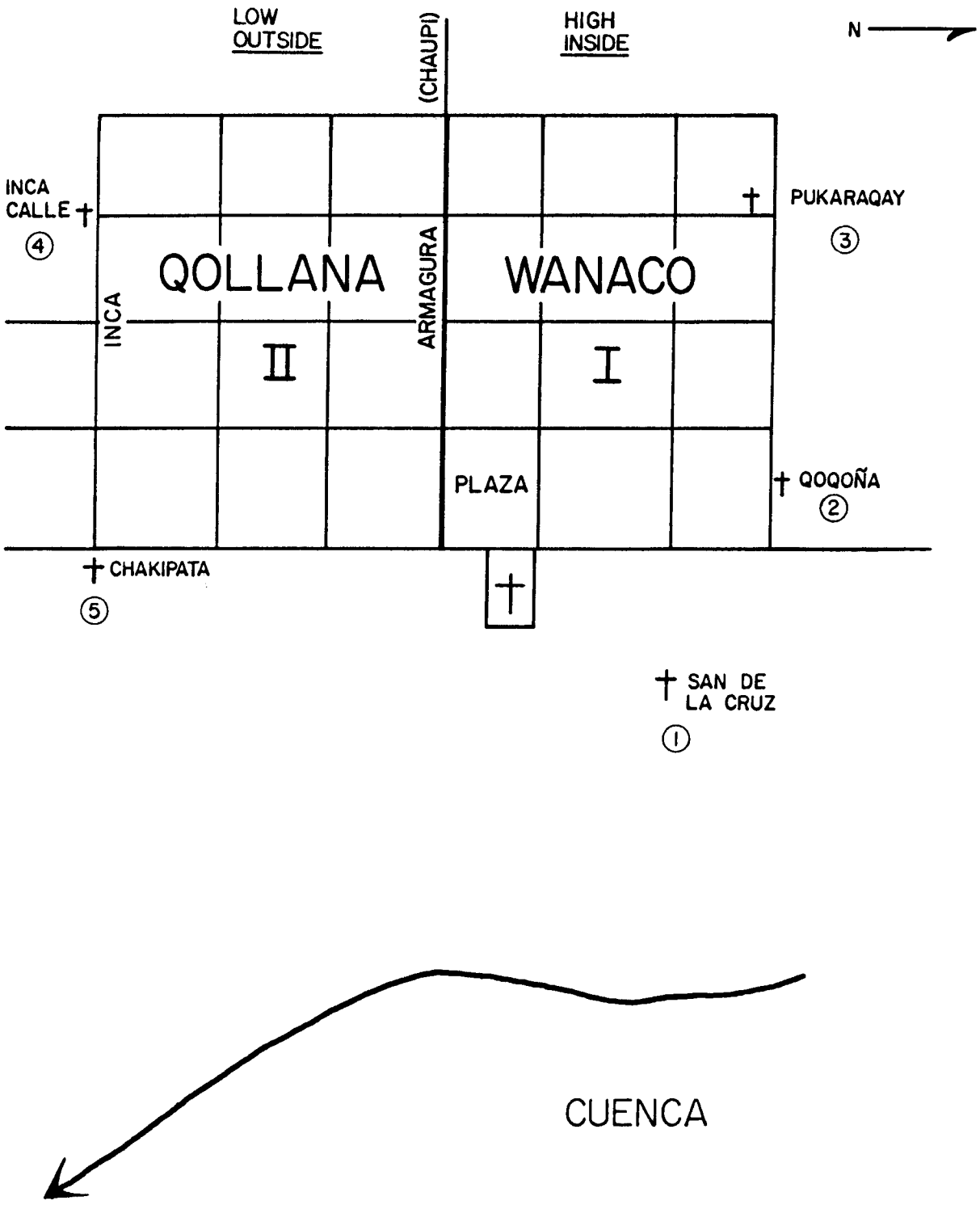

Figure 2B. Divisions within the urban center of Cuenca. After Houdart-Morizot 1976.

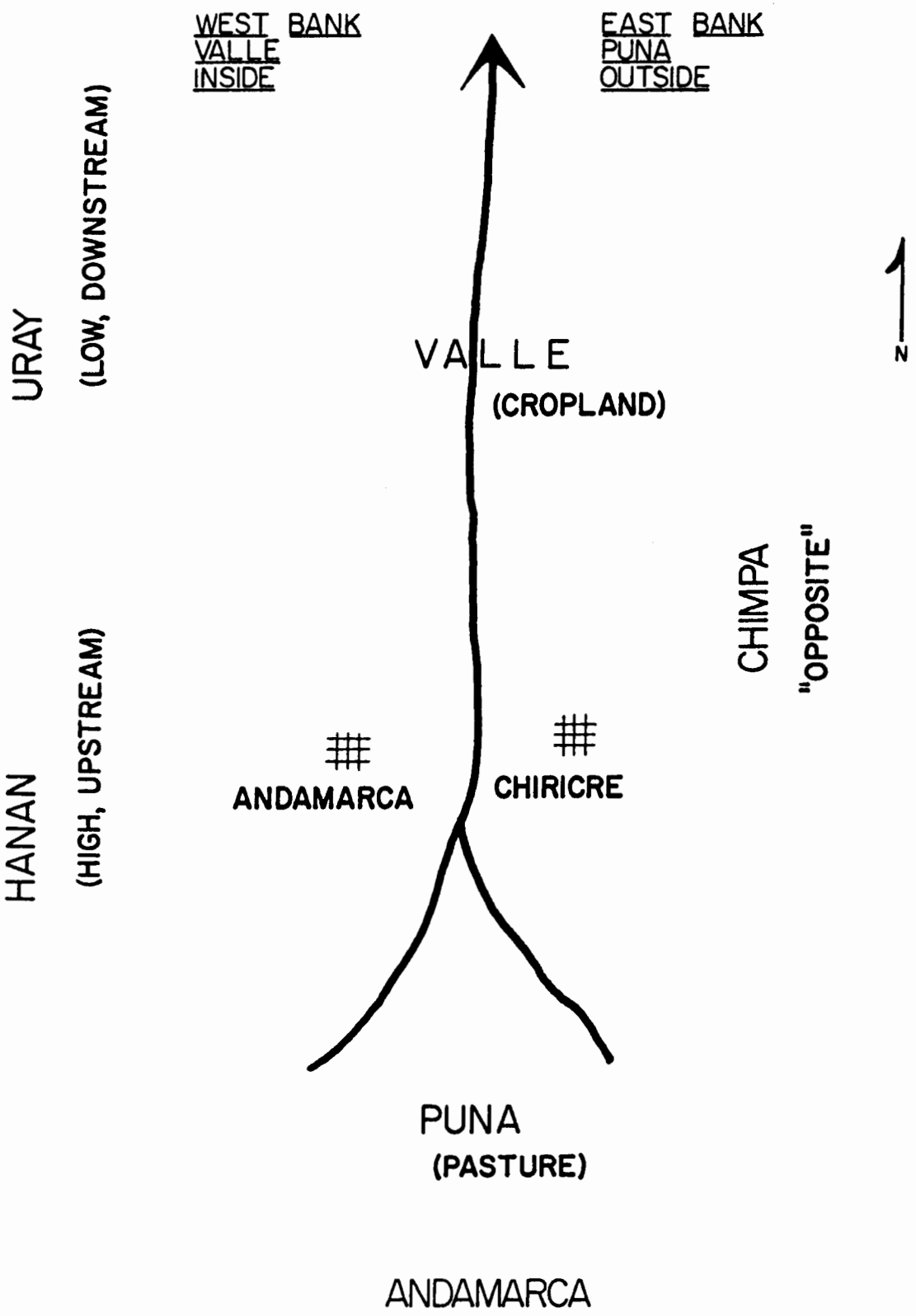

Figure 3A. Organization of the rural hinterland of Andamarca. After Ossio 1976.

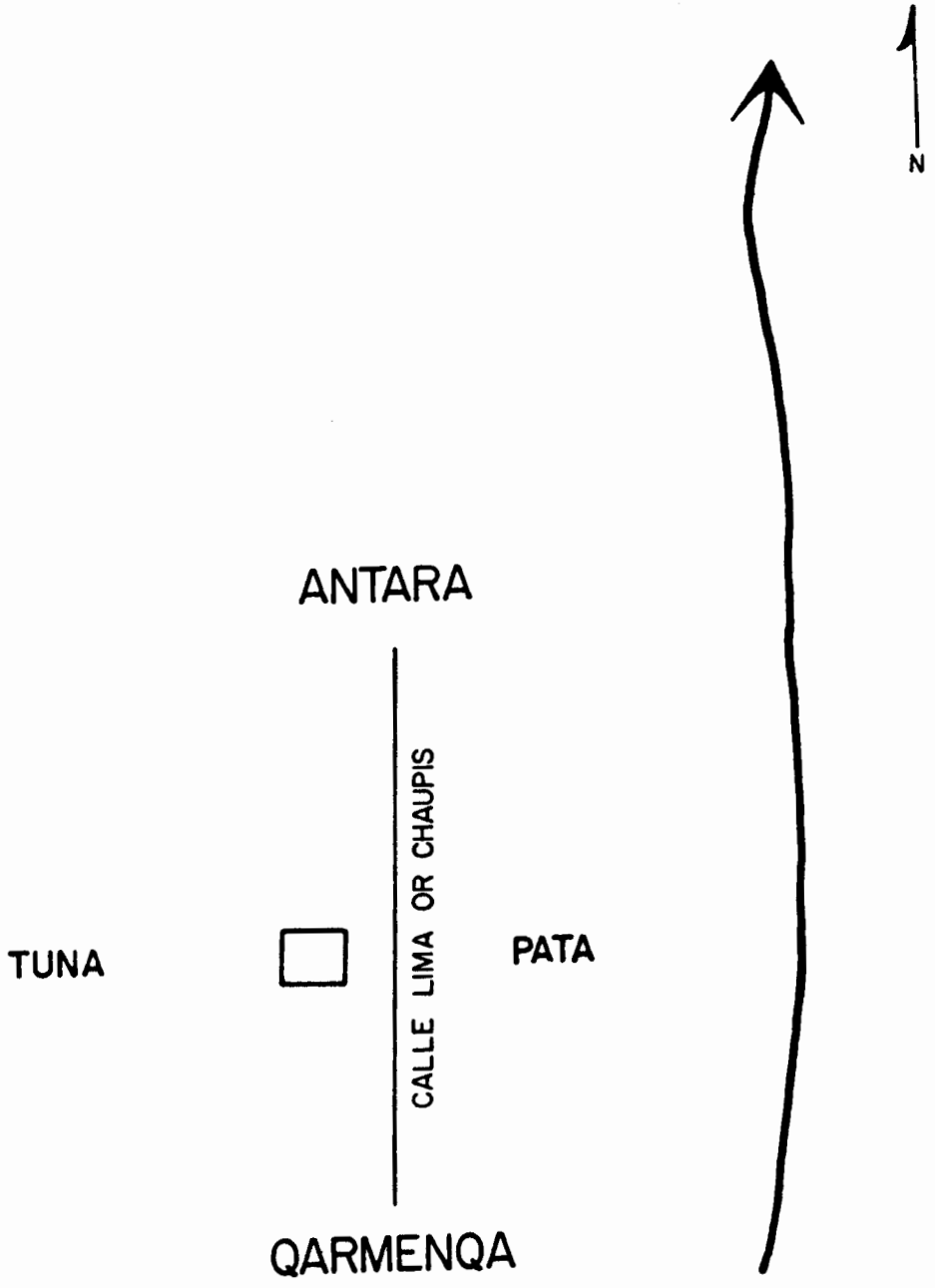

Figure 3B. The divisions within the town of Andamarca. After Ossio 1976.

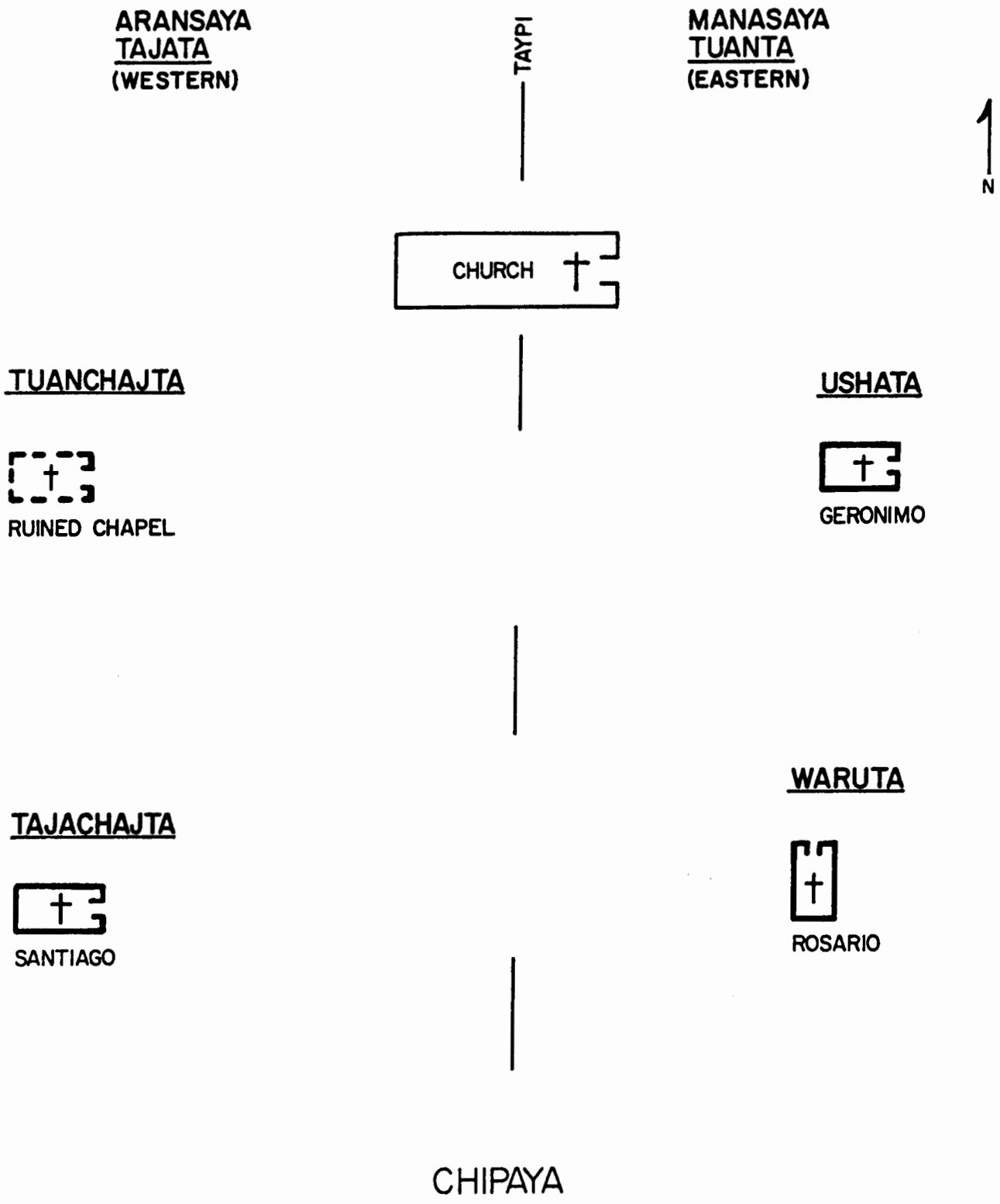

Figure 4A. Quadripartite organization of the village of Chipaya. After Wachtel 1974.

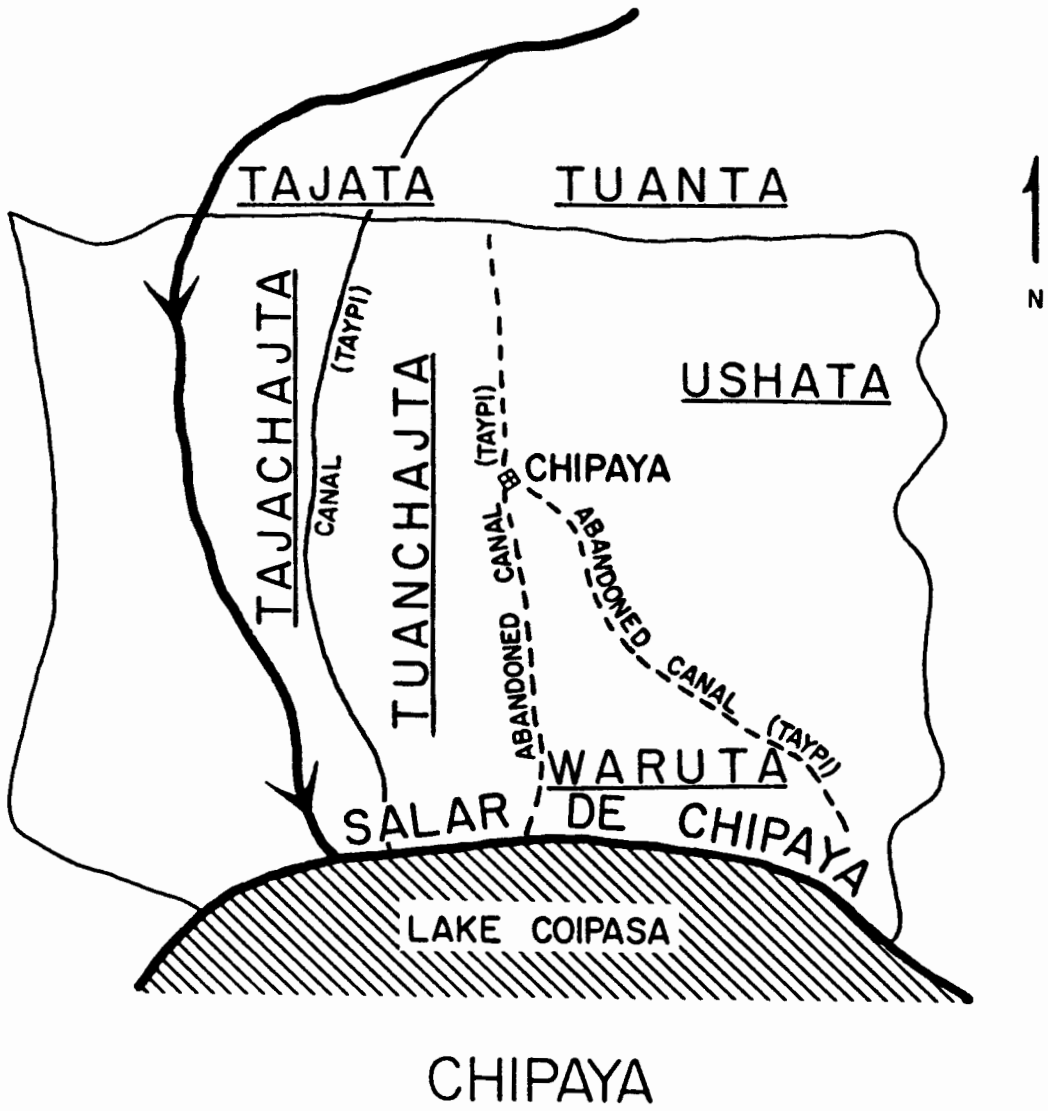

Figure 4B. The rural territory of Chipaya. After Wachtel 1974.

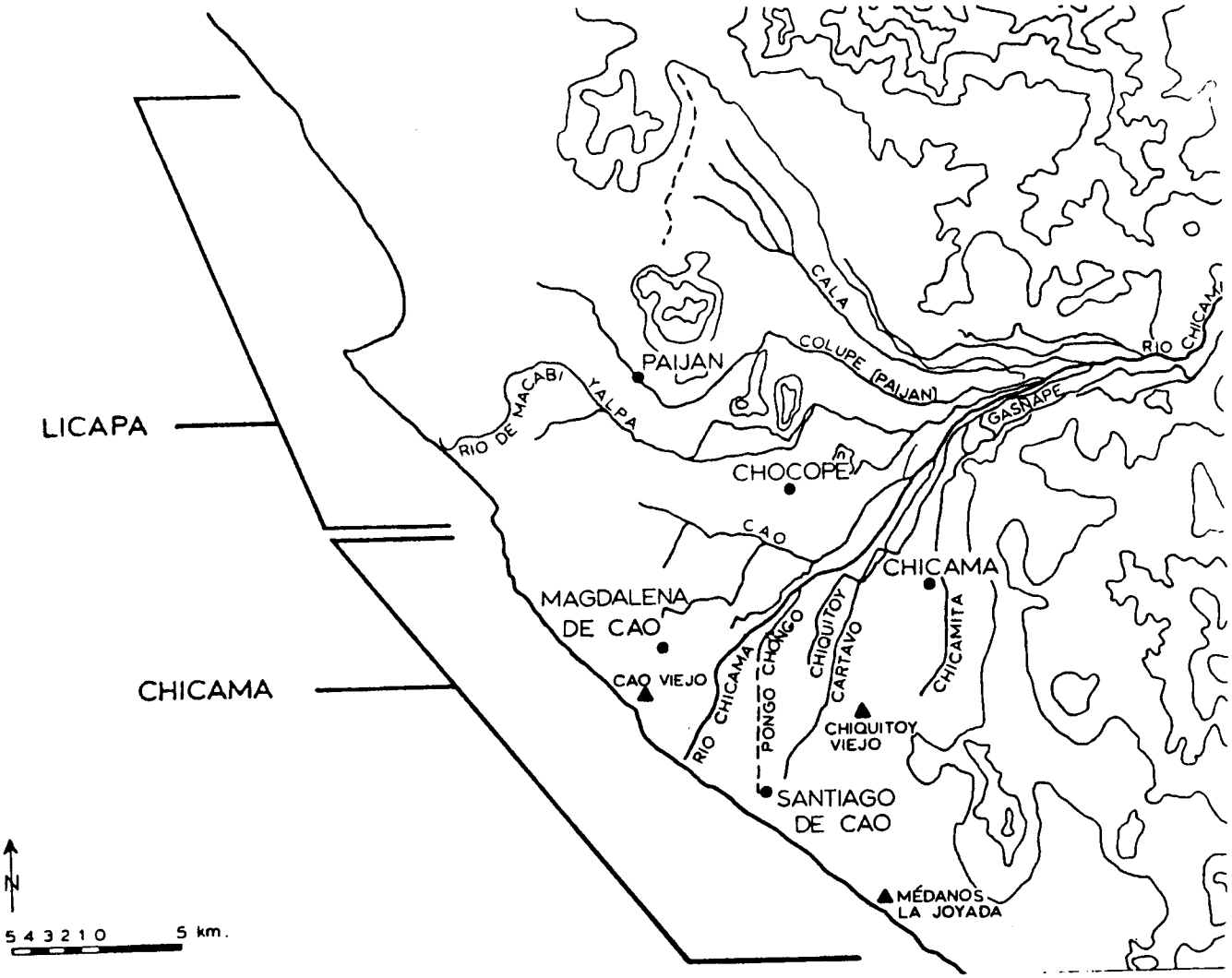

Figure 5. Map of the Chicama valley showing the 16th century division between Licapa and Chicama, major archaeological sites, and the four **reducción** villages of Chicama. The canals are modern.

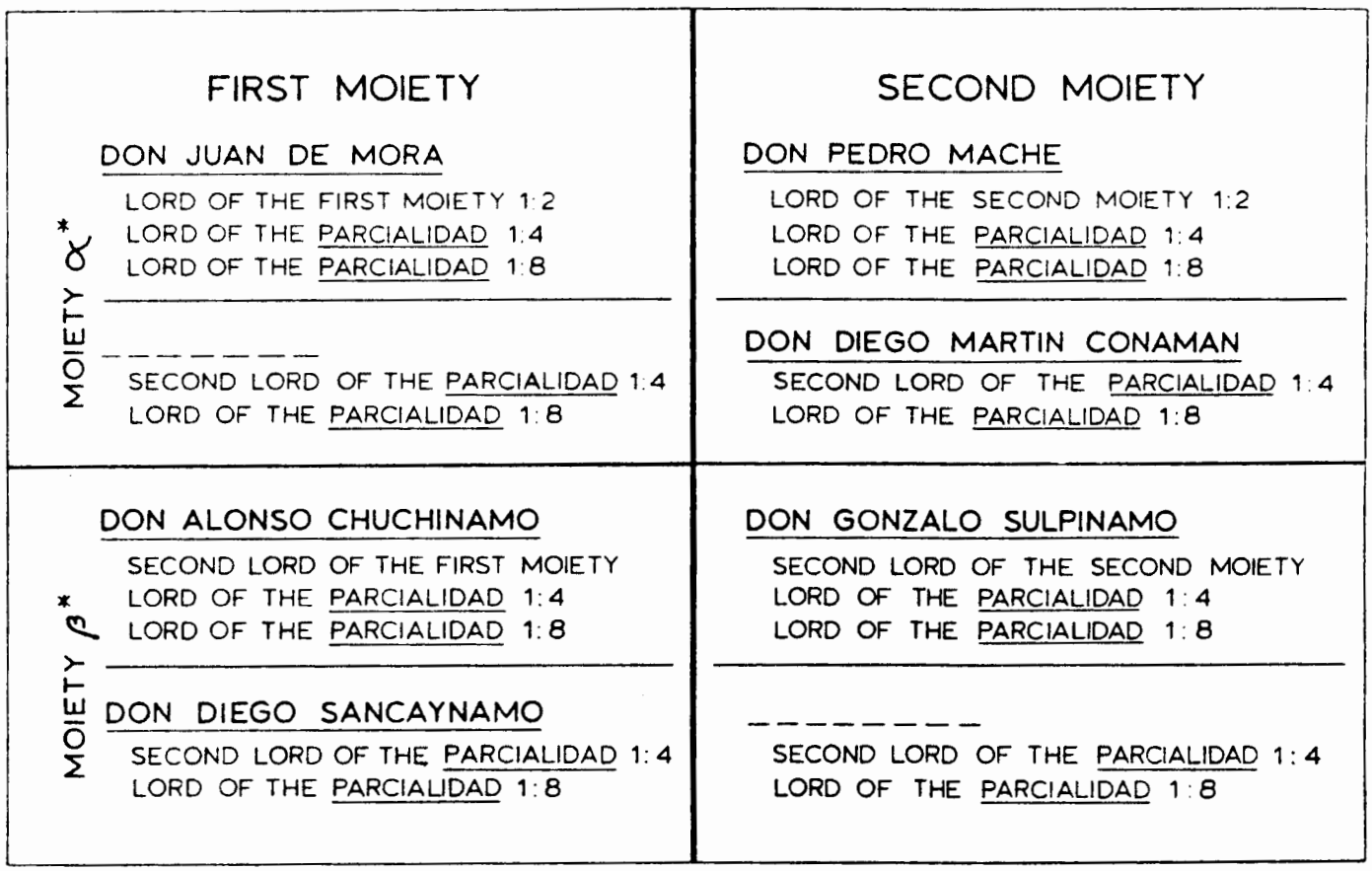

Figure 6. The sociopolitical organization of the polity of Chicama in 1565.

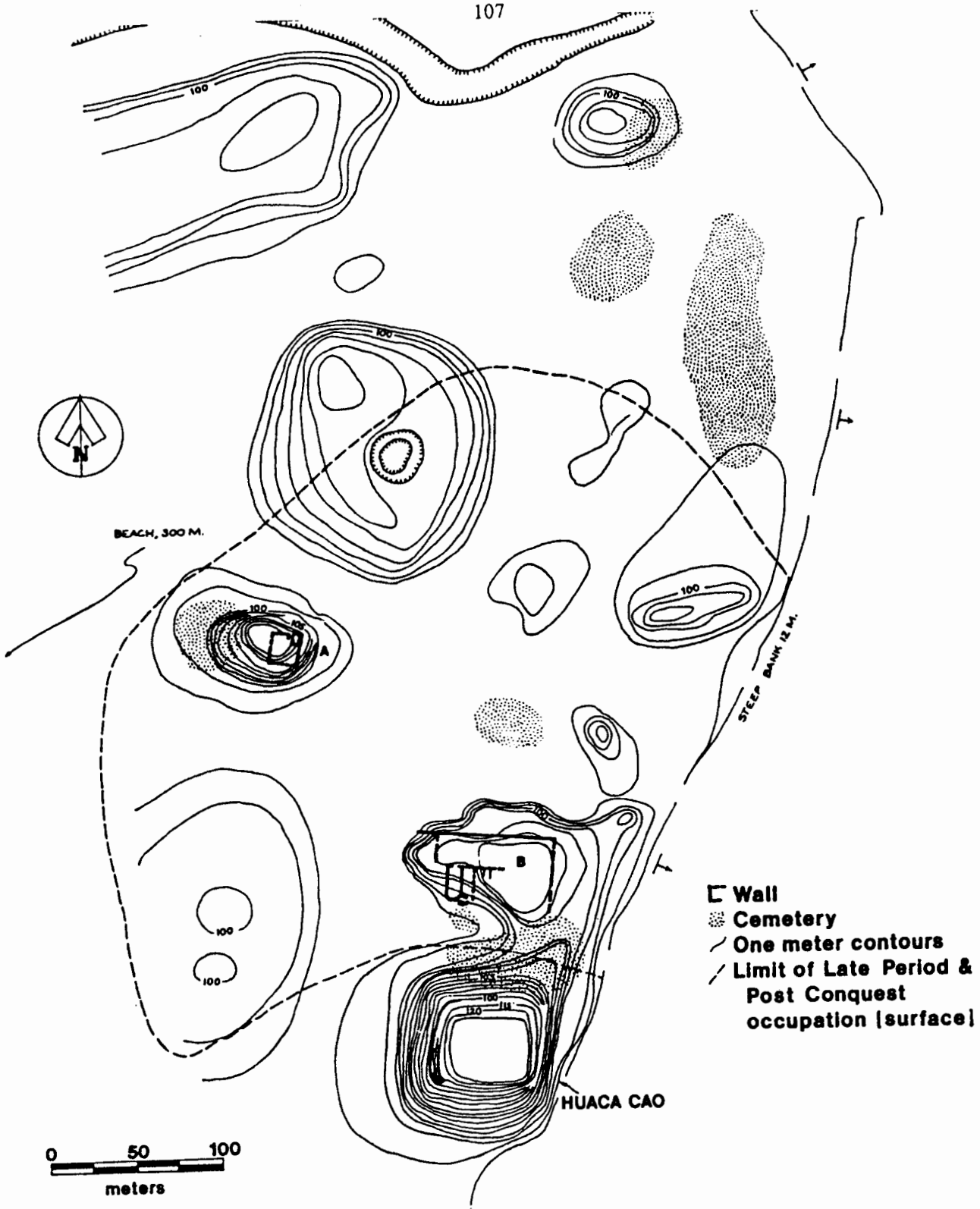

Figure 7. Cao Viejo lies on the same relict terrace as the Preceramic site of Huaca Prieta. The Huaca Cao dates to the Early Intermediate Period. Structure A is the early 16th century church complex, built on a prehistoric platform in front of the Huaca Cao. Structure B is an elite residential structure associated with the terminal prehistoric and early colonial occupation of Cao Viejo.

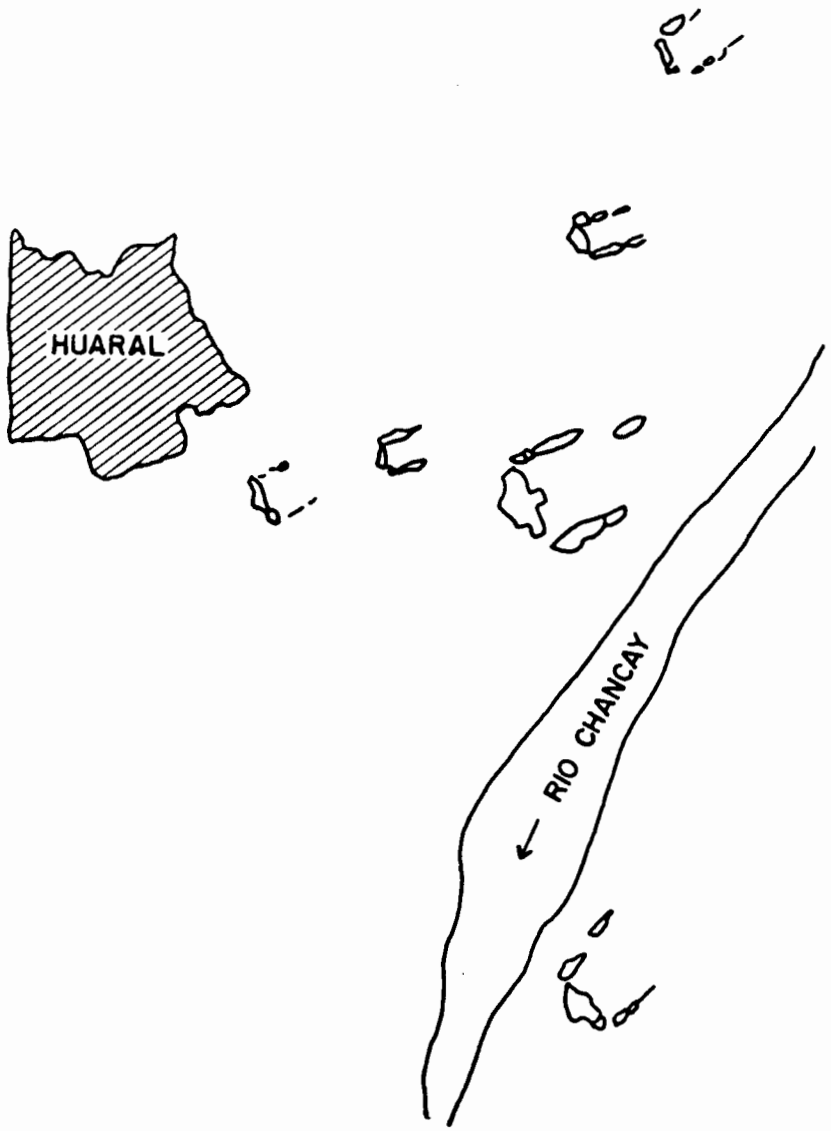

Figure 8. U-shaped mounds of the Chancay Valley on the Central Coast. Note the difference in scale between the four smaller structures and the two larger ones. The placement of the four small mounds with regard to the larger one is also significant. After Williams 1980.

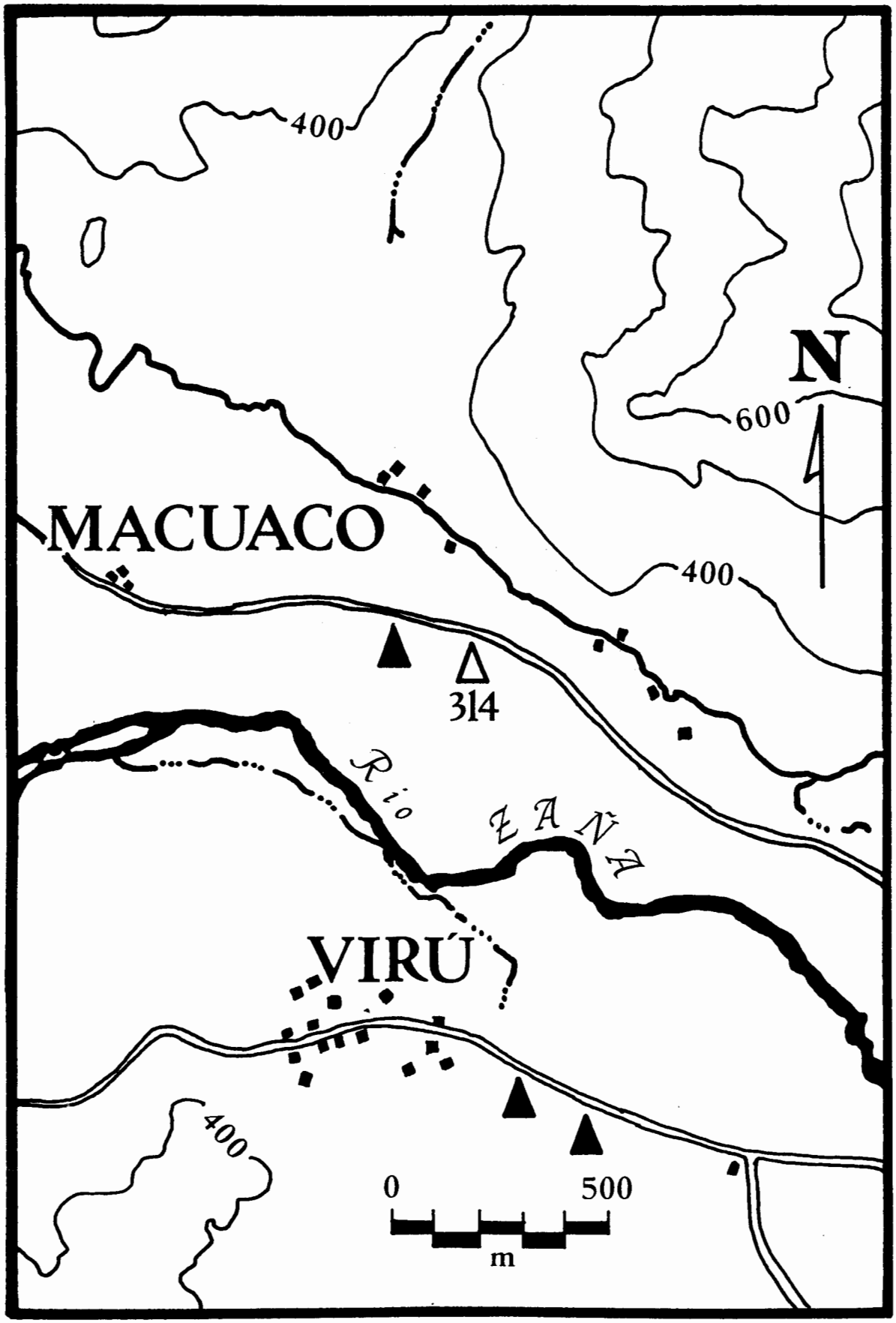

Figure 9. The Macuaco and Viru mounds (triangles) in the Middle Zaña Valley.

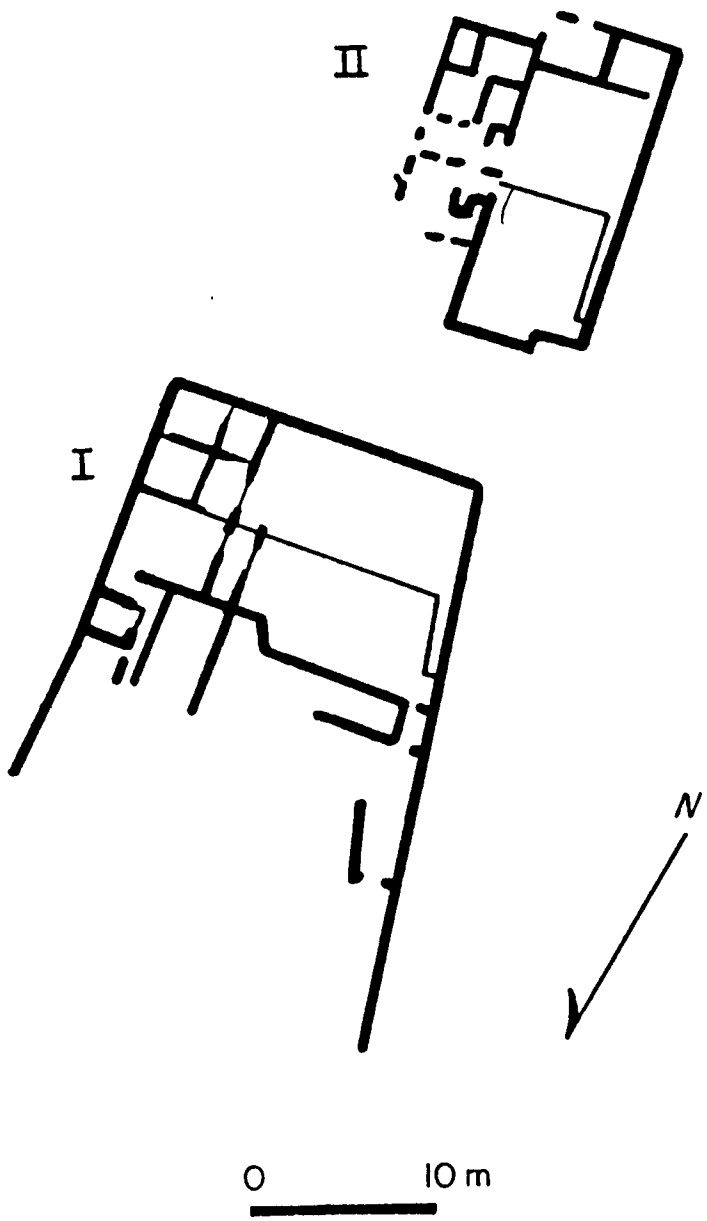

Figure 10. The two elite administrative/residential structures at Huancayo Alto in the Chillon Valley.

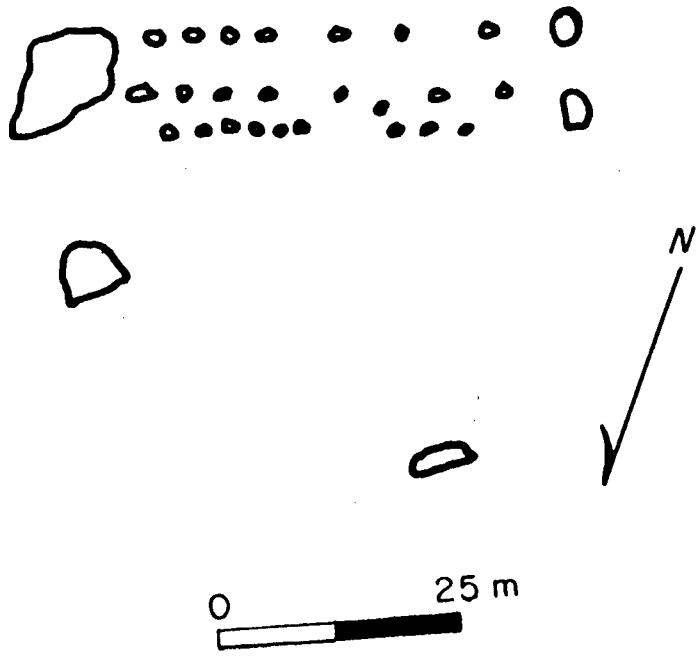

Figure 11. The two Early Horizon mounds in the vicinity of Huancayo Alto. The apparent third structure to the south is a modern rock pile. There was a double-coursed causeway leading to the larger mound, part of which has been destroyed by modern farmers.

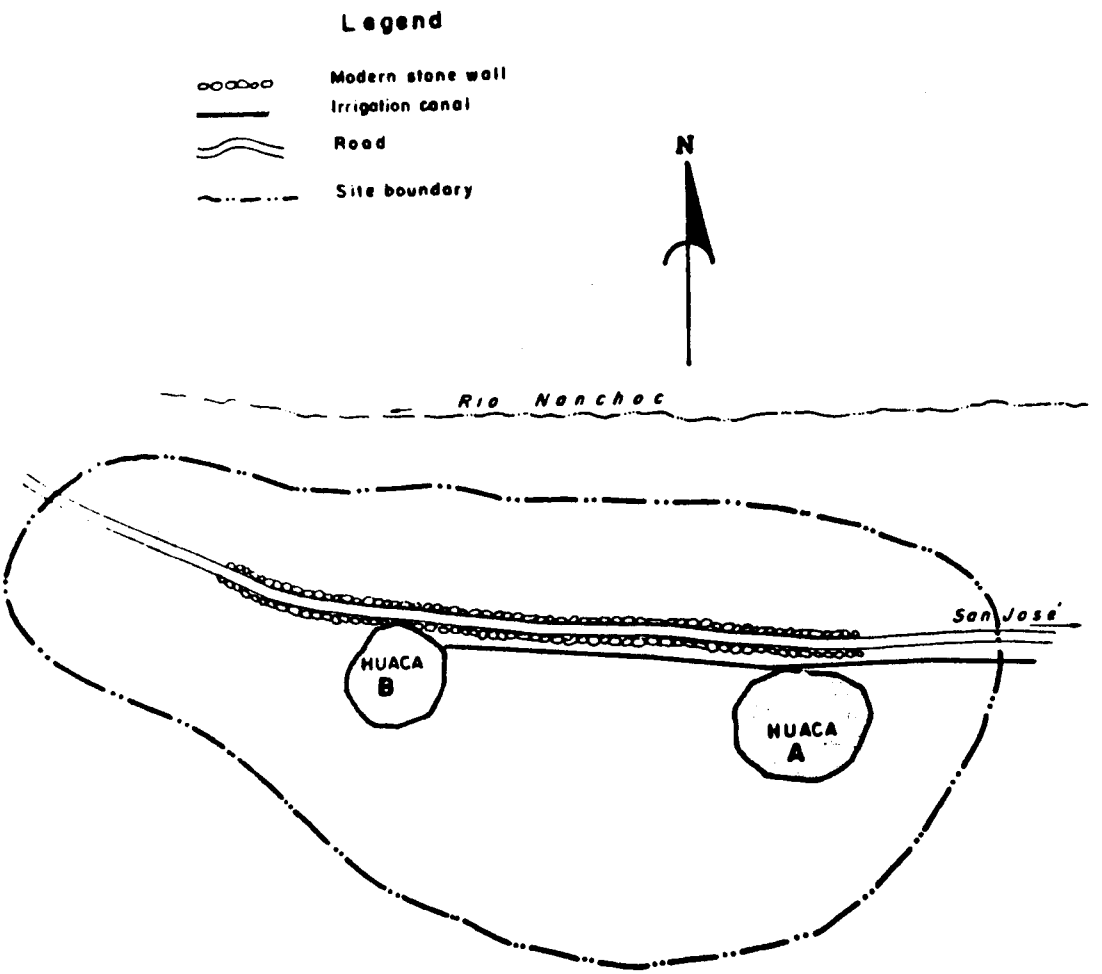

Figure 12. Field sketch, not to scale, of the two San José mounds in the Nanchoc Quebrada. The mounds and the surrounding occupation date from the Early Intermediate Period.

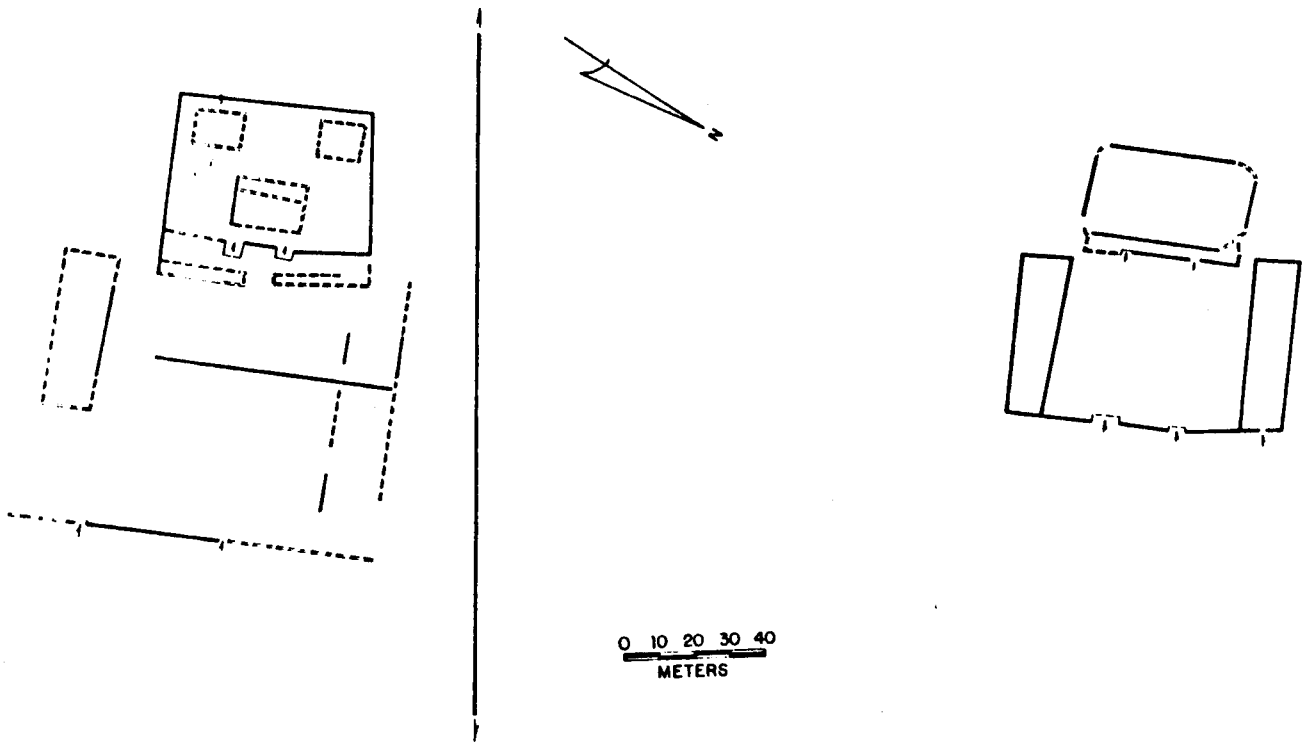

Figure 13. The two U-shaped structures at the San Luis II site. The dividing wall dates to the Late Intermediate Period.

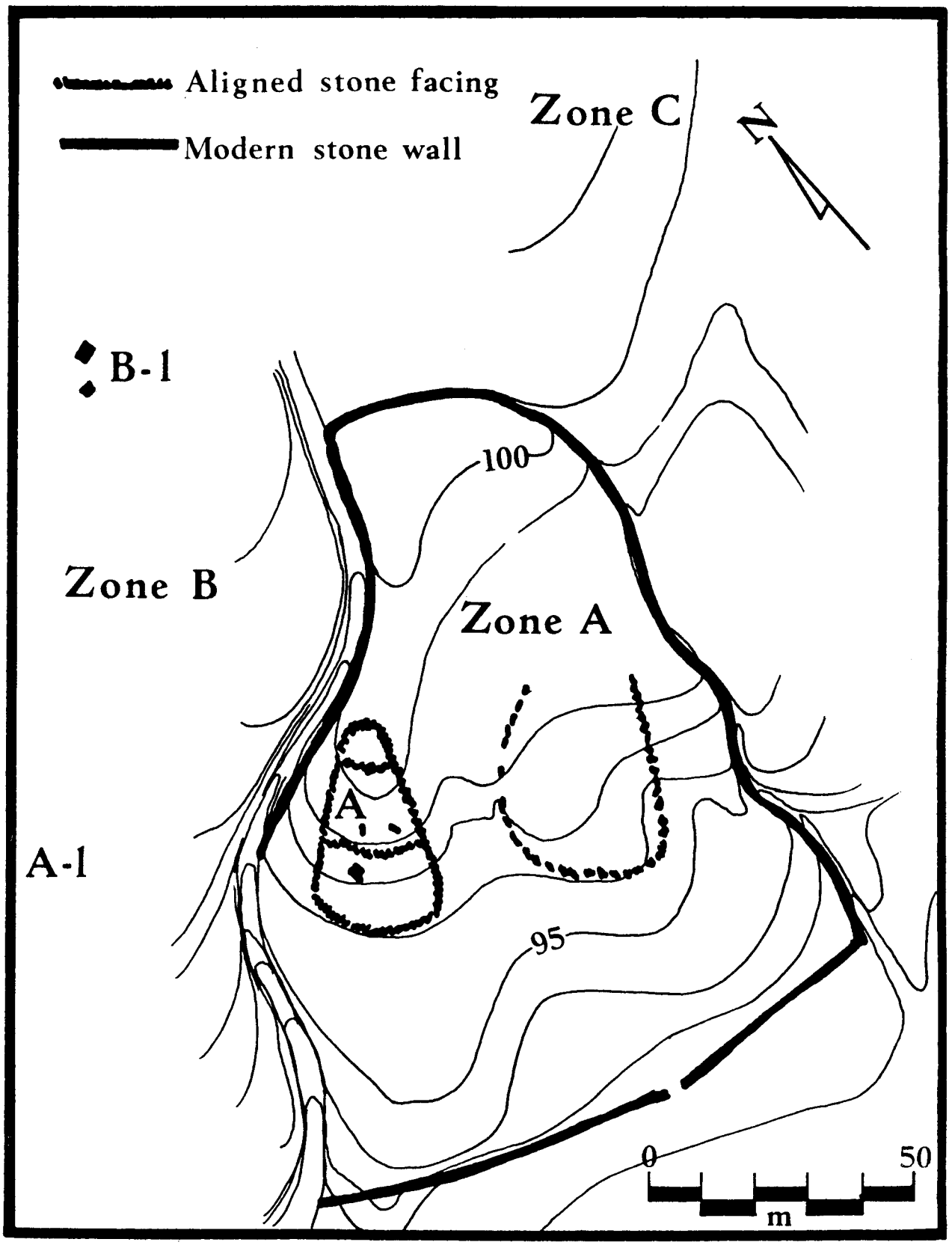

Figure 14. The two low platform mounds at the Cementerio de Nanchoc site in the Nanchoc Quebrada.

PIRURU: A PRELIMINARY REPORT ON THE ARCHAEOLOGICAL BOTANY OF A HIGHLAND ANDEAN SITE

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As part of a larger archaeological project, we are engaged in the analysis of plant remains from Piruru, a highland Andean site in the Department of Huanuco. Although our investigations include plant remains of all types, the present report discusses only biogenic opals, or phytoliths, since this class of biological microfossil is relatively little known to Andean archaeologists.

The site of Piruru in the Department of Huanuco is located on the right slope of the Rio Tantamayo at 3800 meters mean elevation above sea level. From the present day village of Tantamayo, the site is reached by a 2 to 3 hour climb to the edge of the puna. Piruru is an open site marked at the surface by fortifications of the Late Intermediate Period which cover an area of about 4.5 hectares. The current excavations have been in progress since 1981, particularly in lower levels in which a rectangular platform was discovered by Girault in 1970 (Bonnier et al. 1983). This structure and another like it are composed of a fill of rocks and soil contained by a low wall of 2 courses of standing stones. The original platform probably dates to the Preceramic Period. The Formative Period is also represented at the site . . .

Since 1981 Bonnier and Rozenberg have directed the project. They have designed the excavations to comprise 3 units: Unit I/II, 15 meters square; Unit III, 40 meters square; and Unit IV, 30 meters square. By the end of the 1983 season the excavation of Unit I/II had been completed. A maximum depth of 3.8 meters is recorded. Considerable progress has been made in Units III and IV and the excavations may be completed during the 1985 field season.

A stratigraphic summary as recognized by Bonnier and Rozenberg primarily on the basis of Unit I/II excavations shows a substantial hiatus in occupation between Early Formative and Late Intermediate phases. Table 1 summarizes the occupational sequence.

Because Piruru is an open site the contents of the site are subjected to precipitation moisture which would affect organic materials in a way different from materials protected in a cave or rockshelter site. The influx of plant remains growing at the surface of an open site may be quite different from what might be encountered in the case of a sheltered site. Soil pH at the site ranges from about 5 to above 6, moderately acid to nearly neutral. Animal bones are only rarely encountered, and the

distribution of calcium and other exchangeable ions suggests substantial leaching, but the phosphorus content suggests that bones may have decomposed in the soil.

TABLE 1

PHASES OF OCCUPATION	ARCHITECTURE
PIRURU TANTAMAYO Late Intermediate	FORTIFIED SETTLEMENT
Fill.....	
PIRURU PIRWA Early Formative	CIRCULAR STRUCTURES
PIRURU WAYTA Preceramic	PLATFORMS
PIRURU WAKCHA Preceramic	SUBTERRANIAN CONSTRUCTION

So far, pollen preservation has not been good in those samples which we have extracted. A marshy area a few miles from the site has good pollen preservation but lacks sufficient depth for adequate coring. Extracts from the marsh surface show an overwhelming proportion of grass pollen and palynomorphs from nonseed plants (Kaplan and Bonnier, excerpt from a paper presented at the Society for American Archaeology Annual Meeting, Denver, May 2, 1985).

Grasses are important in the domestic economy of the Andes and are major components of the vegetation, which varies with elevation in its species composition. Because of these interacting factors and the interest of Andean prehistorians in the economic integration of vertically distributed environmental zones, we chose to include a study of phytoliths in our project.

The present vegetation in the vicinity of the site is heavily cropped by domestic animals and probably by small wild herbivores. Thorny shrubs are the most conspicuous aspect of the dry season vegetation, since grasses tend to be closely cropped by domestic animals, especially sheep and a few bovine cattle that belong to the family whose residence is adjacent to the site. Small wild animal species no doubt account for a considerable share of the total herbivore effect. Above the site, the bunch grasses and cushion plants predominate and it is this area that provides much of the **paja** (straw and thatch) that is used for domestic purposes. At this stage of the project, we do not sufficiently understand the pattern of plant exploitation of the area to know how much of the useful grasses are obtained locally and what fraction must be brought in from a distance. The crops grown locally are **oca**, *Oxalis tuberosa*; **ullucu**, *U-*

lucus tuberosa; **mashua**, *Tropaeolum tuberosum*; the Andean potato, *Solanum tuberosum*; and **quinoa**, *Chenopodium quinoa.* Oats are grown at a lower elevation, about 3400 meters.

We have completed or have in process the analysis of over 60 soil samples for phytoliths from the site and several from offsite controls. The latter are taken from a boggy area which receives run-in from surrounding grass-covered hills, from a walled corral which has been used as a sheep pen, and from the soil surface within the confines of the site.

Rovner (1971) introduced phytolith analysis as a method for analysis of archeological sediments. Pearsall (1982) has reviewed the use of the procedure and has employed phytolith analysis in the detection of maize present in coastal Ecuador (1978) and in the botanical analysis of Cotocollao, in the province of Quito (personal communication, 1984). The results of these studies suggests that the method merits wider use in Andean archaeology and vegetation analysis.

Although phytoliths have been shown to be abundant in nongrass plants (Piperno and others, personal communications), they are particularly well known in grasses and for this reason can be expected to be particularly abundant in the **puna** and **suni** vegetation zones. The taxa of grasses that are best represented in the puna climatic zone are those belonging to the subfamily pooideae (= festuceae) which carry on C3 photosynthesis. C3 grasses (the Calvin-Benson photosynthetic cycle) are characteristic of grasslands having growing season temperatures of 60 - 78 degrees F (15 - 25 C) (Gould and Shaw 1983:50). C4 photosynthesis typically carried on by many grasses of the paniceae subfamily is most efficient at high growing season temperatures above 80 degrees F (30-40 C) (Gould and Shaw, 1983: 50). This, of course, is much higher than the temperature typical of the puna climate during the growing season. Certain phytolith types, particularly a dumbell-shaped or bilobate type, are so specific to the paniceae that their presence and relative frequency can be used as an indicator to differentiate paleoclimates in some geographic areas. Contemporary ecological correlations of temperature, elevation, and photosynthetic carbon cycle in East Africa (Livingstone and Clayton 1980) are sufficiently regular so as to permit paleoclimatic reconstruction based on fossil grass cuticles in that area. Such correlations have not yet been established in the Andes.

At Piruru we are in the process of collecting and analyzing soil samples for both pollen and phytolith remains. Relatively little pollen is present or well-preserved. We, therefore, place greater emphasis in our microfossil studies on phytolith analysis. Soil samples are collected along with flotation samples so that when the analysis of seed and wood flotation materials has been completed, comparisons of macro- and microfossil remains may be made.

Extracted phytoliths suspended in 100% ethanol are dropped onto a glass microscope slide. The ethanol is evaporated, canada balsam, cedar oil, or another high refractive index medium is added, the phytoliths are stirred into the mounting medium with a wooden applicator stick, and a cover glass is added (See Appendix). The phytoliths may then be examined by optical microscopy. A series of reference slides has been assembled by processing herbarium materials collected in the vicinity of the site.

Our classification of phytolith types is based on that of Twiss, Smith, and Suess (1969) as modified by various workers especially Brown (1984) and Mullholand (personal communication). The term "panicoid" in general use by phytolith analysts for the bilobate or dumbell form suggests that this type is characteristic of the Paniceae subfamily of grasses. This usage is appropriate in midcontinental North America, where almost all of the phytoliths of this type do indeed derive from species of this subfamily. However, the term cannot be usefully applied in the puna where the bilobate "panicoid" phytolith form is abundant but where there are probably no species of this subfamily represented. The importance of this circumstance has become apparent in the current study and is presented here to serve as a caution to other workers and to avoid misunderstanding.

In some of our counts, bilobate phytoliths reached 9-10%. This count is unexpectedly high at a mean elevation of 3800 meters in the Andes if the source of bilobates are grass species within the paniceae. This initial assumption in our study was based on North American (Twiss et al. 1969) and East African (Livingstone and Clayton 1980) findings concerning the distribution of panicoid and festucoid grass species. We speculated that the bilobates in our site samples might have been derived from woody panicoid grasses brought up from low elevations on the eastern slopes of the Andes. A study of our marsh sample and recently received plant collections showed that the bilobates were present in offsite control sediments and in a festucoid grass *Stipa* sp.. Gould and Shaw (1983) record the presence of bilobates in this genus in North America, but the abundance of these phytolith types in some of our samples was unexpected.

As far as we have gone in the analysis, it appears that phytoliths are well preserved in these soils, that differences between surface control samples and prehistoric sediments may be discerned, and that differences occur in the percentage composition of phytolith types in different parts of the site. With respect to the significance of the panicoid (bilobate) phytolith type occurring in these prehistoric sediments, we emphasize that even the most general application of a north temperate (or East African) model to a highland Andean system may be completely wrong. We are continuing our analysis in an attempt to utilize phytolith evidence to recognize activity areas within the site, to distinguish sterile fill from culturally derived matrix components, and to detect any evidence for vegetation change.

Our phytolith study will complement our study of other botanical remains at Piruru, but it is too early to know whether phytolith analysis will provide results which are independently significant. It may be that the ubiquity of grasses in the puna and the extensive utilization of the genus *Stipa* results in a uniformity of deposition, a blending of the natural vegetation with culturally derived sources, that will make interpretation difficult. Whether or not independent significance becomes apparent, it is clear that to achieve any usable results at all, a well developed set of reference materials is absolutely necessary and offsite controls are essential.

We hope to extend our site-related studies to a larger examination of phytolith types, their distributions in highland Andean soils, and their relationship to the vegetation and its changes.

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APPENDIX
Phytolith Procedures

Soil Extraction Procedure adapted from various sources for use with highland Andean soils.

If soil sample is devoid of clay, omit 1 - 6. For acid soils delete 7.

(1) Put soil sample (about 100 gm) in 500 ml beaker.
(2) Add distilled H_20 to fill beaker.
(3) Add 10 g Calgon and stir well.
(4) Let settle overnight, and decant off liquid.
(5) Repeat steps 2-4 about 5 times.
(6) Wash sample w/DH_2O and let settle overnight, decant liquid through a fine brass or stainless steel screen. Discard the large particles in the screen.
(7) Test the sample which has passed through the screen for presence of carbonates by adding 2 ml of 10% HCl to sample--if no bubbling proceed to next step--if there is a reaction, add 10% HCl to sample and let stand overnight, or until reaction ceases. Decant liquid.
(8) Place 5 - 10 ml of wet sample into watch glass and dry in oven.
(9) When sample is dry, transfer to 50 ml beaker or flask.
(10) Add 30 ml chromic/sulfuric commercial glass cleaning solution and let stand overnight. If solution is very thick, add more chromic/sulfuric and allow to digest for at least 4 hours more, longer if necessary.
(11) In hood, add carefully DH_2O to beakers of sample to 50 ml to double volume in beaker. Contents of beaker will heat.
(12) When cool, pour sample into a large centrifuge tube (polypropylene 50 ml).
(13) Centrifuge for 5 minutes at #3 in a bench top clinical centrifuge, decant, and wash 2X.
(14) Transfer pellet to a 15 ml tapered glass centrifuge tube and wash (dehydrate) with 100% ethanol 2X, agitating w/vortex agitator and stirring w/wooden applicator stick before centrifugation.

Continue extraction with tribromomethane (bromoform) according to the method of Rovner (1971) or with zinc chloride as follows.

(15) Add $ZnCl_2$ solution (adjusted to specific gravity of 2.4 at which point a glass microscope slide will remain suspended in the solution). Mix well with applicator stick and centrifuge at #3 for 1/2 hour.
(16) Decant supernatant into 2nd 15 ml centrifuge tube (tapered glass). There will be about 6 ml supernatant in tube.
(17) To 2nd centrifuge tube containing supernatant, add water to 12 ml (mix well, centrifuge, and decant). Water should have lowered specific gravity so that phytoliths sink into pellet.
(18) To the 1st pellet add more zinc chloride as in step 15. Repeat steps 15-17 2X each time adding supernatant from heavy liquid centrifugation to 2nd centrifuge tube.

(19) Discard remaining sample from 1st centrifuge tube. Wash sample in 2nd tube w/distilled water 3X (centrifuge at #3 for 5 minutes) with thorough mixing between.
(20) Wash sample w/95% ETOH 2X as in (19).
(21) Transfer pellet to small vial, rinsing centrifuge tube w/95% ETOH.

(22) To make permanent slide:

a) Place 3 drops of sample suspension (phytos in ETOH) onto a microscope slide.

b) Place on slide warming tray and allow ETOH to evaporate.

c) Add 3 drops of dilute Canada balsam in xylene (about the consistency of vegetable oil). Other high refractive index mounting media suitable for diatoms may be used.

d) Add coverslip immediately.

e) Allow slide to remain on slide warmer to evaporate xylene and harden Canada balsam.

f) A nonhardening high contrast mounting medium such as cedar oil may used in place of a hardening medium in order to facilitate the rolling over of phytoliths during examination.

ANALYSIS OF ORGANIC REMAINS FROM HUAMACHUCO QOLLQAS

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The Huamachuco Archaeological Project is a long term study being carried out in the north highlands of Peru. Although the project itself has a number of aims and interests, the work reported here was devised to address the identification of storage in architectural remains (Chiswell 1984).

Storage facilities have been identified in a number of locations in the Huamachuco region. The majority of the facilities are related to the Inca occupation of the area, but facilities dating to earlier times have also been found. However, there are also large sites in the area where storage has yet to be identified or is seemingly not present at all. Most notable in this category is the area's largest site, Marcahuamachuco, which was occupied and politically important for over six hundred years.

The absence of storage facilities at Marcahuamachuco is curious. Thè site itself is physically removed from any agricultural land and it does not seem unreasonable that food storage must have been undertaken, if for no other reason than to support the large population estimated for the city. Therefore, it seems likely that stockpiling at Marcahuamachuco occurred in facilities that have yet to be positively identified. Thus, the project was interested in considering methods of addressing this problem.

For a number of reasons, the choice of analytical technique fell to phytolith analysis. The study of botanical silica was originated by botanists and soil scientists, but has been applied to archaeological questions with increasing frequency in the past decade. However, there had been no previous application of the phytolith analysis for the purpose described here and it was necessary to "test" the technique under conditions permitting greater control over the variables involved. The application chosen was to consider the question of storage in more obvious facilities, the Late Horizon **qollqas** (storage structures) which were identified in the area in 1981 (Topic and Topic 1982:10).

To confirm the results of the phytolith work, it was necessary to draw on independent sources of information, and the qollqas were also submitted to more "traditional" methods of analysis--excavation and flotation. This research will be described first and then compared with the results of the phytolith study.

In terms of location, Huamachuco's storage complex seems to be most similar to the facilities associated with the site of Hatun Xauxa in the Mantaro Valley (Earle et al. 1980:30-35)--both are dispersed groups of storerooms arranged on the hills in the immediate vicinity of the Inca settlement (which, in our case, is thought to underlie the present day town of Huamachuco).

The Huamachuco storage facilities consist of five groups of qollqas on three hills southwest of town: Cerro Santa Barbara, Cerro Mamorco, and Cerro Cacañan. Cerro Santa Barbara is the largest of the groups and has 72 qollqas arranged on four terraces. However, preservation is not good and this count is a minimum, reflecting only the buildings which are still physically represented.

The size of the terrace system suggests that the original count may have been considerably larger. Cerro Mamorco has three rows of qollqas physically isolated from each other. Cerro Cacañan has the fewest storerooms, but also has a number of larger associated buildings, which are thought to have served administrative purposes.

The minimum number of Inca qollqas at Huamachuco is therefore 144. The storage facility is thus not a large one, particularly when compared with the figures available from Inca sites further south. A number of other differences from other known Inca storage complexes can also be identified.

Unlike the pattern reported elsewhere (for example, Morris 1967), both circular and rectangular building forms are not represented in the Inca facilities of Huamachuco. Rather, all five complexes consist exclusively of rectangular buildings of relatively uniform architectural characteristics. However, despite this difference, Huamachuco's structures are consistent enough with the general pattern of Inca storage (Morris 1971:137-138) to support their identification as qollqas. Built of stone, they are situated along the contours of the hills on which they are located. They average between 5 and 7 meters in length and 2.5 to 4 meters in width. Doors are rarely preserved, indicating that they were probably elevated; the door of one example at Cerro Mamorco was raised 35 centimeters above present ground level.

Excavations conducted at qollqas on each of the three hills have revealed interesting differences in structural detail between the three groups.[1] The Cerro Santa Barbara qollqas have three low parallel walls on which a raised floor was likely supported. The floor treatment of the Cerro Mamorco and Cerro Cacañan qollqas was somewhat different. The excavated examples on these hills are transected by three parallel subfloor canals, in all but one example. Where preservation is good, the canals proved to open through both the up- and downslope sides of the qollqa walls. Thus, excavation has revealed two very different approaches to floor construction that seem to occur in separate parts of the storage complex.

A consideration of the facilities with respect to the differing storage requirements of different products helps provide a tentative interpretation for the structural differences observed between qollqas (see also, Morris 1981). Of the two types of construction, the one that resulted in a raised floor (Cerro Santa Barbara) would probably have been the most effective means of minimizing humidity. The qollqas with canals would probably have been more humid inside because of the more direct contact with the soil below. In addition, humidity inside the qollqas could have been further raised by using the canals to channel water under the structures. From what is known of the storage requirements of maize and tubers, it might be hypothesized that maize and possibly other dry goods were being stored at Cerro Santa Barbara and tubers at the other two sites.

The analysis of the minimal amounts of non-modern plant material recovered by flotation tends to confirm this interpretation. Soil samples from the two qollqas excavated at Cerro Cacañan produced only modern botanical material with the exception of a very small amount of fragmentary wood charcoal. The Cerro Mamorco samples yielded slightly more material, including carbonized seed fragments of two unidentified, presumably non-food, species from the first qollqa, a few burned maize fragments from the third qollqa, and small amounts

of fragmentary wood charcoal from all three. The best recovery of botanical material was from the Cerro Santa Barbara samples, which produced much larger quantities of burned maize and wood charcoal. Thus, the storage facilities which were thought to be devoted to dry storage on the basis of their raised floors produced the most maize. The anomalous example in terms of this interpretation is the recovery of maize at Cerro Mamorco. However, it should be noted that while the structure involved did not have a raised floor, it also did not seem to have the sub-floor canals which were observed in the other buildings at the site and so is anomalous in terms of its structure as well as its contents. Thus, the general correlation of raised floors with maize and dry storage and of sub-floor canals and tubers would seem to hold.

Before turning to the work done with phytoliths, one other example of storage facilities in the Huamachuco area should be mentioned. These facilities, at the site of Cerro Amaru, are of interest because they present an interesting comparison to the facilities already described.

In addition to other architecture, Cerro Amaru has a group of structures arranged in four rows along the contour of the hill. The structures are made of unmodified stone and have a circular form approximately 6 meters in diameter. Despite all the features which would lead to their identification as another portion of the Inca storage facility, the ceramics recovered from excavation have led to a Middle Horizon assignment. This interpretation is supported by radiocarbon ages which are in marked contrast to those from the Cerro Santa Barbara qollqas:

Cerro Amaru	1270±80;	A.D. 680 (UGa 4870)
	1550±60;	A.D. 400 (UGa 4871)
Cerro Santa Barbara	395±75;	A.D. 1550 (UGa 4661)
	475±65;	A.D. 1475 (UGa 4662).

Notwithstanding the early date of the structures, excavation of two of the buildings identified a number of features that indicate they may have been constructed as storehouses. The inner wall of each example was ringed by a low bench and the floor bisected by a low wall. The upper- and lowermost points of the outer wall were perforated by holes which may have enhanced ventilation. Thus, it seems that the storage concerns were similar to those identified on Cerro Santa Barbara. A floor resting on the bench and medial wall and provided with ventilation would probably have served to create an environment of low humidity, favoring grains over tubers.

To summarize, the present picture of storage in the Huamachuco region is of a complex of structurally different rectangular qollqas dating to the Late Horizon and of a series of circular qollqas which date earlier. The former facility appears to have been devoted to both maize and tuber storage, whereas there is only evidence to suggest maize storage at the latter. It remains to discuss the attempt to use phytolith analysis to confirm or augment these conclusions.

The analysis of phytoliths has only recently been applied extensively in archaeological research. Numerous archaeological problems have been addressed by studies of phytoliths, ranging from paleo-environmental reconstruction to analysis of diet (Pearsall 1982; Rovner 1983). However, one of the most significant contributions has been made in the field of identifying cultivated species,

such as the work done towards identifying maize at Real Alto, Ecuador (Pearsall 1979:135-150). The success of studies such as these in identifying specific plants was one of the reasons for the decision to test phytolith analysis in the study of storage facilities. However, other reasons can be cited concerning the properties of phytoliths themselves and the shortcomings of alternative techniques.

Despite the fact that it has been used in other types of archaeological research, a number of reasons argued against the use of pollen analysis. Large amounts of pollen would not be expected in qollqa soils because of factors of preservation as well as the fact that the pollen-producing parts of plants are unlikely to have been stored. Such factors as contamination from airborne sources would further complicate the interpretation of any results obtained. In contrast, the properties of phytoliths make their presence in qollqa soils much more likely. Phytoliths are composed of a silica compound that is highly resistant to alteration. Unlike pollen, phytoliths are deposited into the soil at the site of plant decay and are less subject to wind transportation. Furthermore, studies have indicated that relatively little movement of phytoliths occurs within undisturbed soils once deposition occurs (for example, Beavers and Stephen 1958). Thus, one can expect to find concentrations of phytoliths in the immediate location of their deposition.

In addition to these factors, other arguments can be made to support the decision to use phytolith analysis in the storage situation outlined earlier. Evidence from other Inca studies indicates that different types of plants were stored separately, for no other reason than differing storage requirements (Morris 1981). Because of this separation, it is reasonable to expect that a limited variety of plants would be represented in any one qollqa. Thus, the phytolith sample from a qollqa should be simplified in terms of the number of forms recovered.

The amount of plant material present in a qollqa is also likely to be greater than in non-storage contexts. Although there is record of looting of stores by the Spanish, other evidence indicates that it is not unlikely that some stores were never removed from the qollqas. The chronicler Polo describes additions being made annually to qollqas even though some materials deteriorated before their use (Murra 1980:133). The recovery of macrobotanical remains from other highland storage situations (D'Altroy and Hastorf 1984:345-346) also suggests that at least some plants remained in the qollqas long enough to decompose and contribute their phytoliths to the qollqa soils.

The project undertaken involved two different types of analysis. Because phytolith work is a relatively young field, there are still large numbers of species which have yet to be studied in terms of their silica content. Predictions can be made on the basis of generalities--grass species tend to contain much more silica than non-grass species--but the discipline is far from the time when descriptive taxonomic guides will be available for even limited numbers of species. Complicating this issue is the fact that phytolith quantities and kinds vary between parts of plants as well as between species. For a study concerned with the identification of specific parts of specific plants, the necessary first step was to analyze these parts in order to characterize their silica content. Having accomplished this, the second step of the study was to extract the silica from soil samples taken from the qollqas and to analyze it with respect to the conclusions drawn from the first part of the study.

On the basis of ethnohistoric accounts and archaeological work elsewhere, a total of 35 plants or parts of plants were identified as storage possibilities. These samples included the edible portion of a variety of both highland and non-highland crops, as well as related items such as maize cobs and peanut shells. Also included were a number of plants which, although inedible, were also thought likely to have been present in storage situations. Included in this category are a number of grass species which may have been used in the packing of stored foods, particularly tubers.

The samples selected were submitted to acid digestion in order to liberate the silica from the surrounding plant tissue. The digestion process produces a dried sample which is mounted for microscopic analysis using Canada balsam (See Kaplan and Bonnier, Appendix, this volume). Biogenic silica assumes a number of forms depending on where it is deposited in the plant's cells. The first observation made was a note of whether silica was present and the relative amounts of each kind of silica. A more detailed analysis was then made of the plants which contained short cells, the type of phytoliths which have proved to be most profitably studied in previous research.

Four of the samples tested--peanut, peanut shell, pumpkin seed, and potato flesh--had either no silica or such small quantities as to be discounted from further analysis. The remaining samples had varying amounts of the various kinds. The majority of the samples had quantities of the kinds of silica which are considered to be relatively undiagnostic, but no short cells. However, seven samples were found to contain large enough numbers of short cells to be considered significant.

The seven samples with short cells in abundance were all, not surprisingly, members of the grass family: four varieties of maize cob,[2] **ichu** grass, caña brava, and an unidentified species of grass collected in the market from a **chipa**, a framework bundle stuffed with leaves used for carrying produce. Each of these samples was submitted to closer analysis and counts of the occurrences of the various short cell forms were made.

When phytoliths are mounted on slides, they become aligned in a number of different positions. It has traditionally been the case when analyzing such slides to ignore all phytoliths which are in a "rotated" position (Twiss, et al. 1969). However, recent studies have demonstrated that useful information can be obtained from the three-dimensional morphology of a short cell and increasing emphasis has thus been placed on trying to observe the shape of a short cell in all positions (Piperno 1984).

The approach adopted for this study is something of a compromise between the two extremes. The samples were mounted in a permanent medium in order to prevent sampling duplication and could not be rotated in order to observe all dimensions. However, observations were made of as many of the characteristics as possible for each short cell encountered. Three separate traits--shape-of-top, shape-of-side, and shape-of-bottom--were observed and classified in terms of a key that was devised on the basis of the forms observed in the plant samples. Approximately 240 short cells were recorded for each of the samples studied.

The plant analysis identified four plants--caña brava, "chipa", ichu, and maize--which could be distinguished from each other on the basis of their short

cells. This conclusion permits several suggestions to be made concerning the interpretation of the soil samples. Given that tubers are thought to have been stored in layers of vegetation, the recovery of a sample with a short cell distribution which resembles that of ichu or chipa might indicate the remains of tuber storage. On the other hand, a distribution which more closely resembles that of maize would lead to a different interpretation. Similarly a sample which strongly resembled that of caña brava would lead to a third interpretation based on the fact that caña brava has been recovered as part of fallen thatched roofs from other Huamachuco sites.

Obviously, these predictions are based on the assumption that the phytolith contribution from the plants involved in storage situations will be so high as to completely mask any other source of silica. Unfortunately, the results which have been obtained from the analysis of soil samples to date tend to prove this assumption to be overly optimistic.

Phytoliths are extracted from soil samples using the principle of flotation--because they have a lighter specific gravity than the matrix in which they are contained, phytoliths can be separated by floating the sample in a liquid with a specific gravity of approximately 2.6.

Extractions were carried out for a total of 25 soil samples representing 8 structures, as well as for control samples collected at each of the three locations where excavations were conducted in 1983 (Cerro Cacañan, Cerro Mamorco, and Cerro Amaru).[3] The samples were submitted to exactly the same analytical procedure as the plants--for each sample approximately 240 short cells were observed and characterized according to the classification key developed for the plant samples. The resulting data were then submitted to two different kinds of comparisons.

The first comparison was between all the soil samples from a single building and the corresponding control sample for the site involved. The purpose was to identify those samples which could not be distinguished from the controls and which could therefore be considered as contaminated or indicative of nothing more than the soil naturally present at the site. Then the soil samples were compared to the plant samples to see if any specific plants could be identified.

The result of the first part of the analysis was the identification of two structures in which none of the soil samples could be distinguished from the control sample. These two structures at Cerro Cacañan were thus not included in the remaining analysis because there was nothing to differentiate their soil from that of the rest of the hill.

When compared with the information collected from the plant samples, five of the six remaining qollqas yielded at least one positive result. All of the positive identifications except one were with the species of ichu grass. On the basis of these results it would seem that ichu was present in both of the Cerro Amaru storerooms tested, as well as in all three of the excavated Cerro Mamorco qollqas. The sole remaining positive identification was of blanco maize cob at one of the Cerro Amaru storerooms.

Interpretation of these results is somewhat equivocal. One of the Cerro Amaru storerooms produced evidence of maize, the crop predicted to be stored at that site. The Cerro Mamorco qollqas produced indications of ichu, which

may represent the packing material that would be expected in conjunction with tuber storage (again the crop predicted for the site). However, the evidence of ichu at Cerro Amaru confuses the whole picture. This grass may represent fallen roofing material, in which case the interpretation of the Cerro Mamorco qollqas must also be called into question. Therefore, the results of the phytolith work with respect to the question of storage must be considered somewhat conditional.

In conclusion, it should be emphasized that there exist a number of possibilities for the refinement of the techniques adopted here. An analysis of all forms of silica, and not just the short cells, may augment the information available from analysis. An increase in the number of samples collected and processed from storage sites might identify sources of variation that have been masked in this study. And the analysis of more plants native to the Huamachuco region, particularly the grasses, may help to clarify some of the external sources of contamination. Thus, the analysis of phytoliths in storage situations has yet to reach the stage of refinement at which it could be usefully applied to the situation at Marcahuamachuco described in opening. However, with continued research the technique would still seem to hold considerable promise.

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Notes

1. Three qollqas on Cerro Mamorco, two on Cerro Cacañan, and an associated structure on Cerro Cacañan were excavated in the 1983 field season. This information was augmented by the excavation of parts of four qollqas on Cerro Santa Barbara in 1982. Unfortunately, no soil samples from the Cerro Santa Barbara qollqas were available for phytolith analysis.

2. Short cells were present in the maize kernel samples, but only in relatively small numbers. The forms of the short cells were identical to those observed for the cob samples and it is likely they are the result of pieces of cob adhering to the kernels after shelling takes place.

3. Control samples were taken in the vicinity of each group of qollqas (but removed from the actual architectural remains) in order to assess the nature of the phytoliths contributed by the naturally occurring vegetation in each area.

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ASPECTS OF CASTING PRACTICE IN PREHISPANIC PERU

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The author has long marveled at the skill and ingenuity evident in the design and fabrication of metal artifacts from Peru; yet he has often wondered the reason for certain features. Why was it done thus when (by our standards) another solution would seem more appropriate? Investigating such intriguing matters gives further insight into Peruvian metals technology, and to the culture of which this technology was a part. The Peabody Museum of Archaeology and Ethnology at Harvard University is fortunate in having an extensive collection of Peruvian artifacts acquired by S. K. Lothrop circa 1940. The author recently examined artifacts in this collection and selected a sample of two object types that displayed features pertinent to this study.

1) Bola Weights

Three bola weights were reportedly found in a cave site on Puma Orqo, a hill at Paquari Tampu, Department of Cuzco. They were identified as belonging to the Inca period. The bola weights were oblate spheroids about 20 mm. in diameter weighing approximately 30 grams each. Each bola weight was fitted with a single opening within which an internal transverse bar could be seen (Figure 1).* Two of the weights were coated with dark green corrosion product, but the third had been cleaned to present a smooth, yellowish, metal surface. The third weight displayed three rectangular inlays of reddish metal arranged symmetrically about its opening; the other two weights, after partial removal of corrosion product, proved to be devoid of decoration. The author judged on the basis of appearance that all three weights were cast of bronze. Qualitative x-ray fluorescence analysis of one weight supported this view by indicating an alloy of copper containing about 15% tin and a small amount of lead. The decorative inlays had the appearance of oxidized copper.

Bolas were used for hunting and fighting by the natives of Peru. These devices consisted of two weights attached to the ends of a sturdy cord or rope. A hunter, on approaching his quarry, would hold one weight over his head and whirl the other about it in a nearly horizontal plane. He next released the hand-held weight simultaneously casting the device at his prey. If his aim was good, the angular momentum of the whirling weights would serve to wrap the cord tightly around the animal and prevent its escape. Bolas were also employed in combat for the purpose of entangling an opponent and impeding his movements so that he might be more readily dispatched with other weapons.

The author elected to investigate and record the device for attaching these bola weights to their respective cords because it: (1) appears unique to the Peruvian culture, (2) indicates sophisticated metallurgical skill, and (3) presents an interesting question of choice. Sectioning one bola weight disclosed an eye-shaped passage through the cast metal (Figure 1). A cord (no doubt smaller in

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* Figures follow text, beginning on page 137.

diameter than the external opening) was apparently introduced, coaxed around the looping passage, teased out of the opening, and then pulled through the loop to the desired extent.

The presence of the loop inside the casting indicates that a core of some refractory material (e.g., clay) was positioned within the mold that was to be invested with molten metal. The craftsman must have removed the core from the finished casting in order to open the internal passageway (possibly by using a wire). A friable core material would have facilitated removal. It has been reported that a mix of clay and powdered charcoal was used in Colombia, probably for this reason (Plazas and de Saenz 1979:16). Cores were commonly used elsewhere in Meso-America, Central America, and northwestern South America to make hollow castings, mostly in order to conserve precious metal (Easby 1966:77).

Metallographic examination of the sectioned bola weight after etching with potassium dichromate solution revealed a coarse dendritic microstructure with coring and shrinkage porosity in the interior of the casting, which cooled more slowly (Figure 2). This microstructure gradually changed to one of fine, equiaxed grains with many annealing twins at the exterior, which cooled more rapidly from contact with the mold (Figure 3).

There was some question whether the bola weights were cast in two-piece molds or in lost-wax investment molds. The author inclines to the latter process, at least in the instance of the decorated weight, because it seemed probable that inlaying was accomplished using undercut rectangular recesses carved into the surface of the wax model and reproduced in the casting itself. Presumably, these recesses were filling with matching pieces of copper which were hammered to expand them into the undercut and lock them tightly in place. Examination of the inlays at low magnification revealed excellent conformity. Since the melting point of copper exceeds that of bronze by roughly 300 C, it is conceivable that copper preforms were positioned in a two-piece mold (together with the eye-shaped core) prior to pouring the casting (Easby 1966:77). However, this alternate procedure would seem quite difficult. The rarity and excellent preservation of the inlaid bola weight precluded destructive examination to determine which possibility is correct.

The study of these weights has raised questions as regards purpose and design. They seem too small to have been used for warfare. Rigoberto Paredes (1918:148) has indicated that Peruvian military bolas had metal spheres about 30 mm. in diameter, which would have weighed more than three times those examined in this study. However, the purpose of the weights was not to impact the target, but rather to provide the circular momentum necessary to wrap the bola cord tightly around it. Therefore, the criterion was strength of cord: not as a single strand, but as a wrapping of several strands. The Peruvians were adept in the use of various natural fibers and were able to make cords that were quite strong, even in diameters commensurate with the openings of these small weights. It seems probable that smaller bolas, such as those examined in this study, were used by the elite for hunting, as of vicuñas. (During Inca times this animal was reserved for royalty [Dorst 1967:202]. Great hunts were organized in which thousands of loyal subjects drove the vicuñas within range of the royal party.)

The design of the bola weights is interesting because the internal passage is not only a unique means for cord attachment; it is more difficult to produce than several alternative means. A circumferential groove, an axial hole throughout, or an external eye (like a jug handle) would have enabled attachment as effectively. Failing to recognize a technical justification for the chosen method, the author can only suggest clean, elegant design as the basis for selection: it was a matter of style intended to please those who could afford (or demand) it.

2) Spindle Whorls

A string of nineteen "copper beads" from Pachacamac, situated in the Lurin Valley on the central coast of Peru, was chosen for analysis. The beads proved to be spindle whorls, i.e., small weights used to steady the motion of spindles used for hand-spinning yarn and thread.

The natives of Peru developed truly remarkable skills in spinning a variety of plant and animal fibers over the span of three millennia prior to the Spanish Conquest (Murra 1962:710). Cotton was used as early as 2000 B.C. in coastal Peru. The llama, principal source of wool for highland weavers, was domesticated by 1000 B.C., if not earlier. Although their looms were primitive in design, Peruvian weavers produced a range of textile products from simple cloths to complex tapestries, brocades, and embroideries.

The prestige that spinning and weaving acquired in Peruvian societies is difficult to comprehend without careful study of such historical records as are available. Clothes, necessary for warmth in the highlands, were valued for comfort, beauty, and indications of status throughout Peru; but cloth itself assumed a number of other important functions. Cloth became "the main ceremonial good and the preferred gift highlighting all crisis points in the life cycle" of the individual: christening, puberty, marriage, and death (Murra 1962:712). Cloth was also deemed an eminently suitable offering for religious sacrifices.

As weaving assumed such importance, the weaver's tools acquired prestige and were valued beyond their normal worth. Spindles were used to spin thread (or yarn) and retain it wound (much as on a spool) for the weaving process. Coarse fibers, such as llama wool, required a larger spindle with a disc-shaped whorl. The whorl acted much as a flywheel to maintain rotational momentum and promote further twisting of the thread beyond that already imparted by the spinner's fingers. However, on spindles for fine threads, such as threads of cotton fibers, the whorl was not used to prolong spindle rotation but rather to steady spindle motion and act as a barrier to retain the winding of thread on the spindle. Peruvian spindles for spinning cotton were needles of palm wood some 20-30 cm. in length. Some whorls consisted of wooden carvings integral with the spindle itself; more commonly, whorls were fashioned separately from baked clay, stone, or (rarely) metal. The separate whorls were made in various shapes of rotation coaxial with the spindle (Figure 4). Some were decorated with engraved designs filled with colored pigments.

Only a few of the metal whorls which the author examined possessed surface decorations. These were free-form designs, not sharply defined, which appear

to have been made by inscribing the model around which the ceramic mold was constructed (Figure 5). The author believes that a wax model would have enabled more precise replication of engravings on its surface. This is consistent with the observation that many Peruvian castings, although skillful and complex, "do not have the detail and delicacy that can be achieved with beeswax (models)" (Bird 1979:51). It has been proposed that models were fashioned from "some other unknown substance that could be melted or burned out of molds" (Ibid). The majority of these metal whorls, however, were in the as-cast (unpolished) condition and without decoration. Typically these whorls were 12-14 mm. in diameter and weighed about 7 grams each.

While examining the metal whorls under a binocular microscope with good illumination, the author observed that a number of these small castings were hollow and that the internal passage varied in size and was at points greater in diameter than the external openings. Since the purpose for this was not apparent, he prepared axial sections of two representative whorls in order to study their interiors. X-ray fluorescence analysis of the sectioned whorls revealed only copper and several percent of arsenic, indicating that the metal was arsenical bronze. The sections immediately disclosed that the whorls were of more complex design than their plain exteriors had suggested (Figure 6). Staining these sections with potassium dichromate served to reveal a mottled cast structure, which was equiaxed (i.e., nondirectional) except in portions which had been deformed subsequent to casting (Figures 7 and 8). Deformation served to elongate the grain of the metal producing a banded appearance in the stained macrostructure. By study of this macrostructure some insight into forming operations was gained, and reconstruction of the as-cast shape became possible (Figure 9). The macrostructure of these whorls indicated to the author a sequence of operations the purpose of which was to lock the whorl firmly on the spindle shaft. The internal rib served to stiffen the hollow casting and determine the points at which flexure would occur as the edges of the end openings were forced inward to grip the spindle. It would seem that the whorls could have been attached to their spindles much more easily (e.g., by a resin adhesive). The inseparable nature of the pressure bond may reflect the high value of the metal whorls.

The internal contours of bronze spindle whorl castings must have been imparted by cores of a refractory material, probably clay. These cores may have served as axles upon which wax (or a substitute) was deposited and shaped by rotation preparatory to fashioning an investment mold.

The author believes that this combination of investment molding and use of cores is consistent with the level of metallurgical expertise that developed in Peru during the Late Intermediate Period.

The bronze whorls represent investments in materials and labor far beyond those necessary to accomplish their nominal purpose; simple whorls of baked clay serve the same function (and, indeed, were used, presumably by the less affluent). Beyond the value of metal painstakingly extracted, consolidated, and alloyed, investment casting of bronze spindle whorls required an impressive sequence of operations demanding both technical knowledge and expert craftsmanship. This level of effort expended to fashion spindle whorls of bronze confirms the importance which Peruvian society attached to weaving and to the tools of this exalted craft.

Conclusion

Both the bronze bola weights and the spindle whorls revealed a propensity for innovative core design that deserves recognition as a new dimension to modern knowledge of the casting technology of Peru and possibly the hemisphere. Although cores were used contemporaneously in Meso-America, Central America, and certain other parts of South America, the apparent objective of craftsmen in those regions was to make hollow castings that conserved metal and did not weigh as much. Peruvian metalworkers discovered that the inside of a casting could be shaped to perform functions that aided or complemented its principal purpose. Features which, if external, might have detracted from the casting's appearance could, by clever design, be hidden within (as in the case of the bola weight's cord attachment device). Internal features could be used to modify mechanical behavior of the casting (just as the rib inside the bronze spindle whorl helped to control deformation needed to clamp the whorl upon its wooden shaft). Interior space could therefore be utilized advantageously, to meet functional requirements and enhance formal design of cast metal objects.

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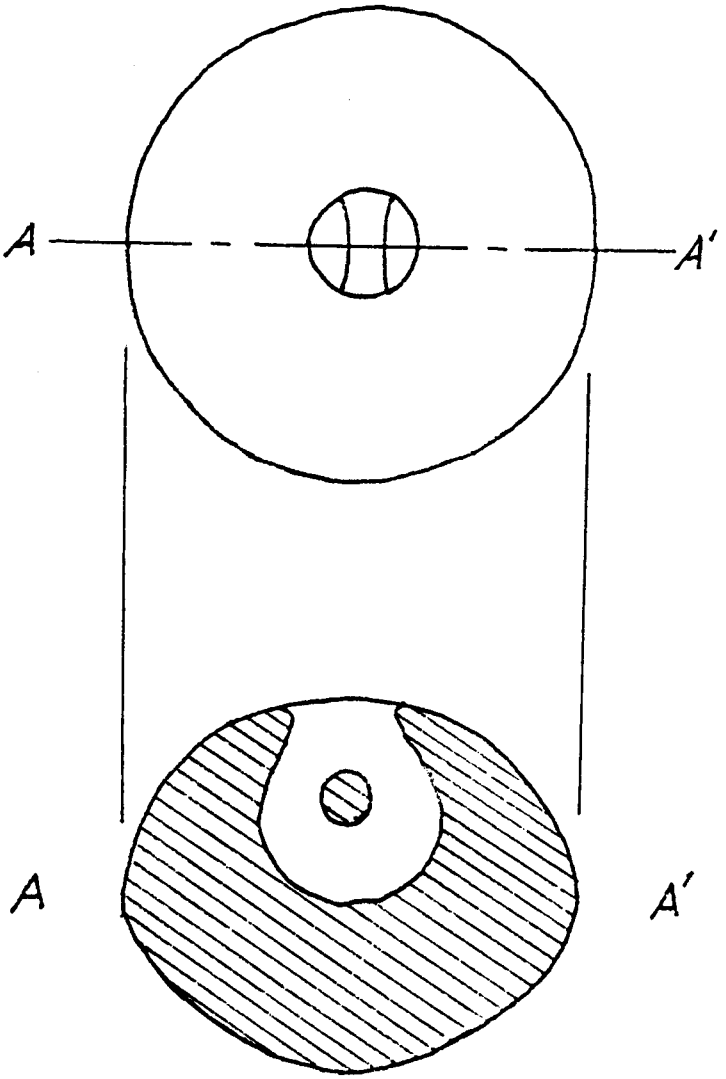
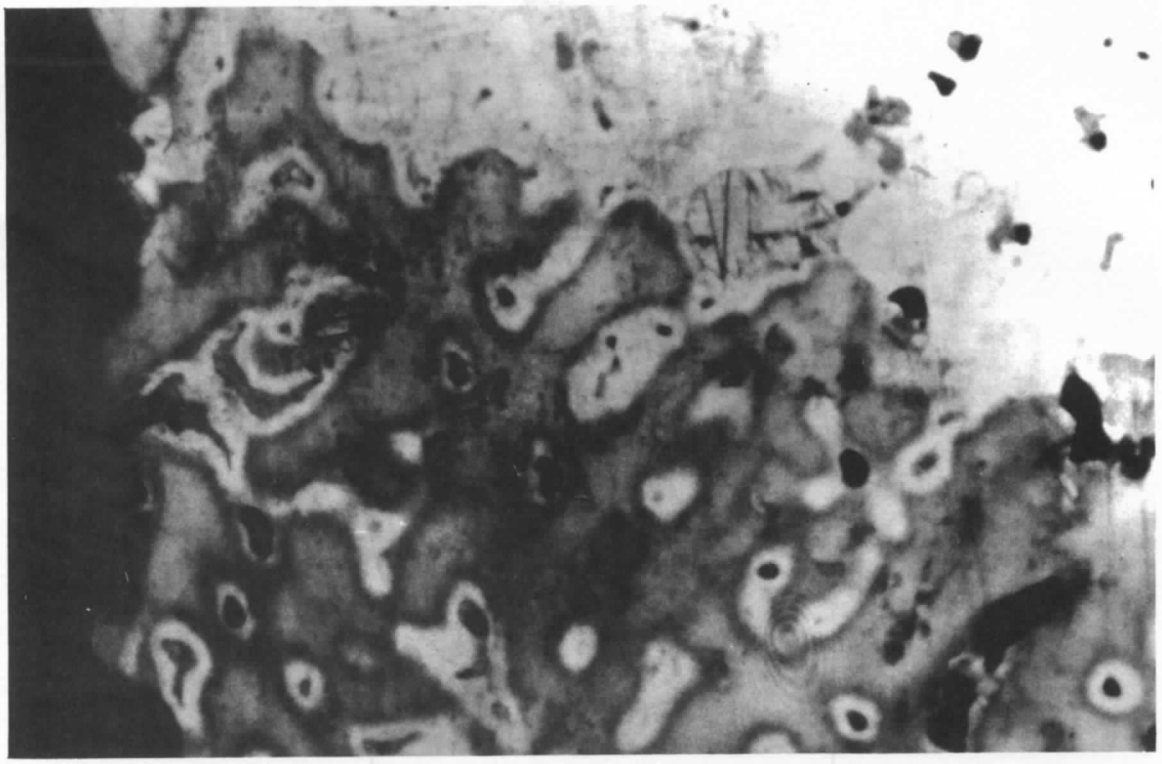


Figure 1. Bola weight, top view, showing single opening with internal transverse bar. Sectional view, below, shows eye-shaped passage through the cast metal.



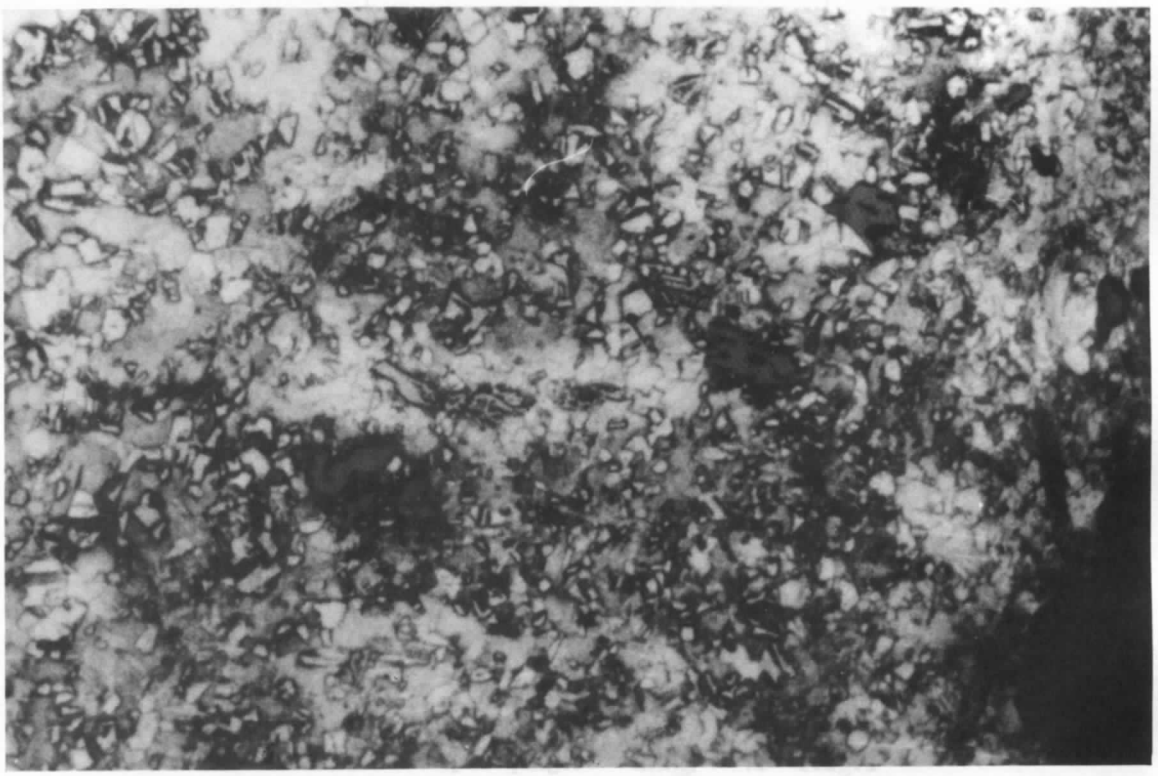


Figure 2. Top. Coarse microstructure near internal passage of bola weight, left, shows dendrites, coring, shrinkage porosity, and twinning. 200x.

Figure 3. Bottom. Fine microstructure near exterior surface of bola weight shows equiaxed grains and annealing twins. 200x.

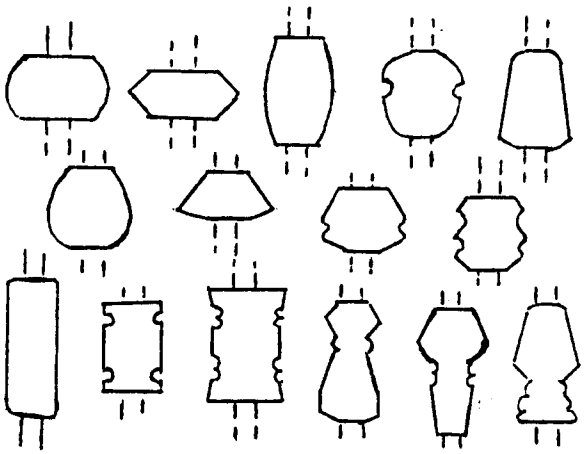


Figure 4. Shapes of some Peruvian spindle whorls (copied from Hirtzel 1928:17).

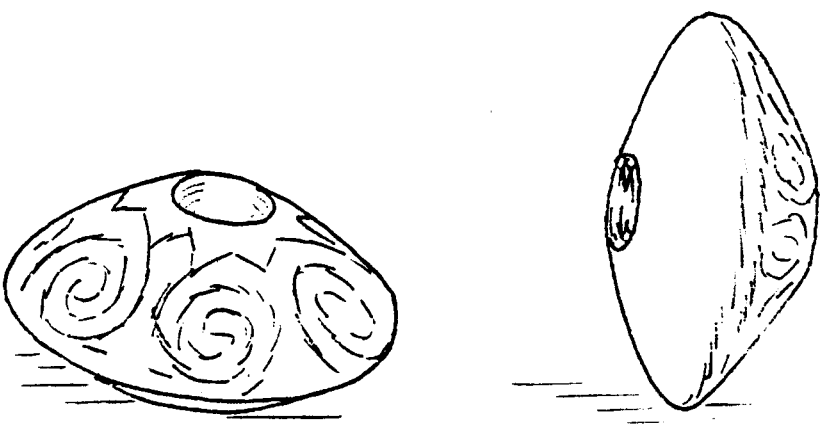


Figure 5. Drawing of lenticular bronze spindle whorl decorated on one surface only.

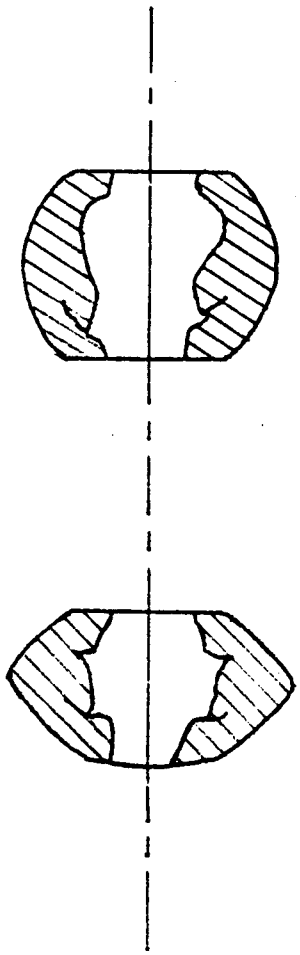
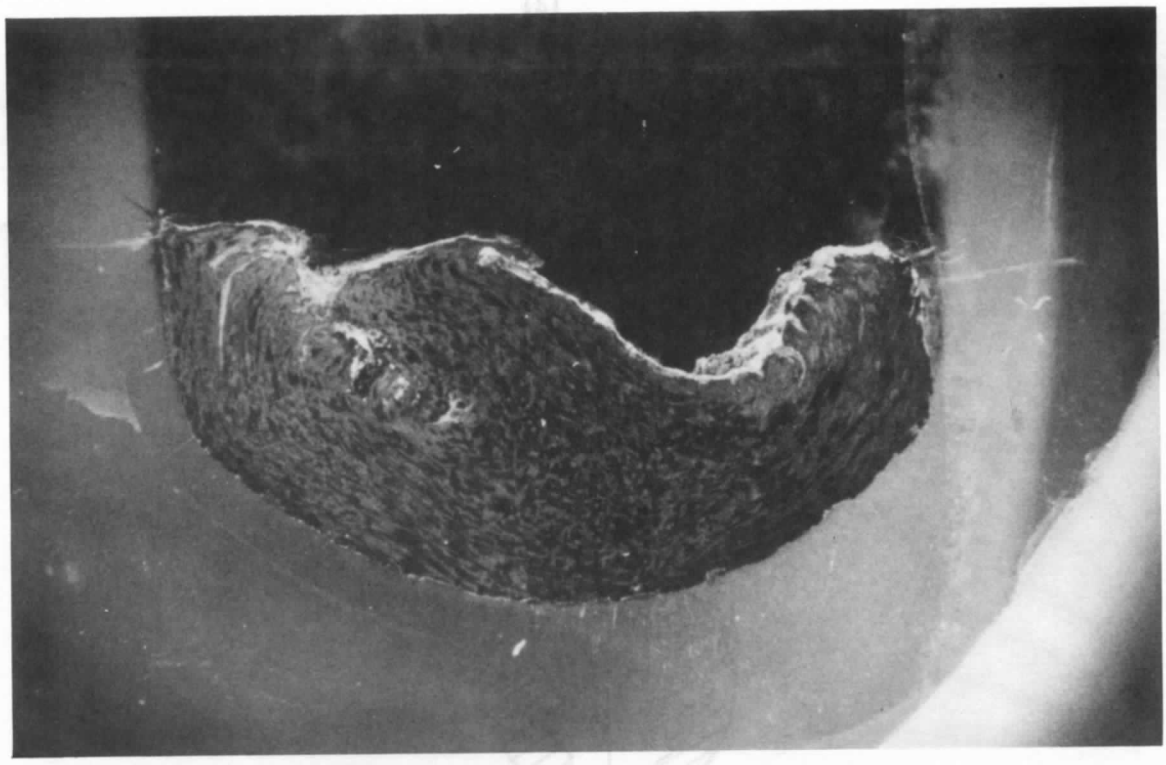


Figure 6. Drawing of cross-sections of two bronze spindle whorls.



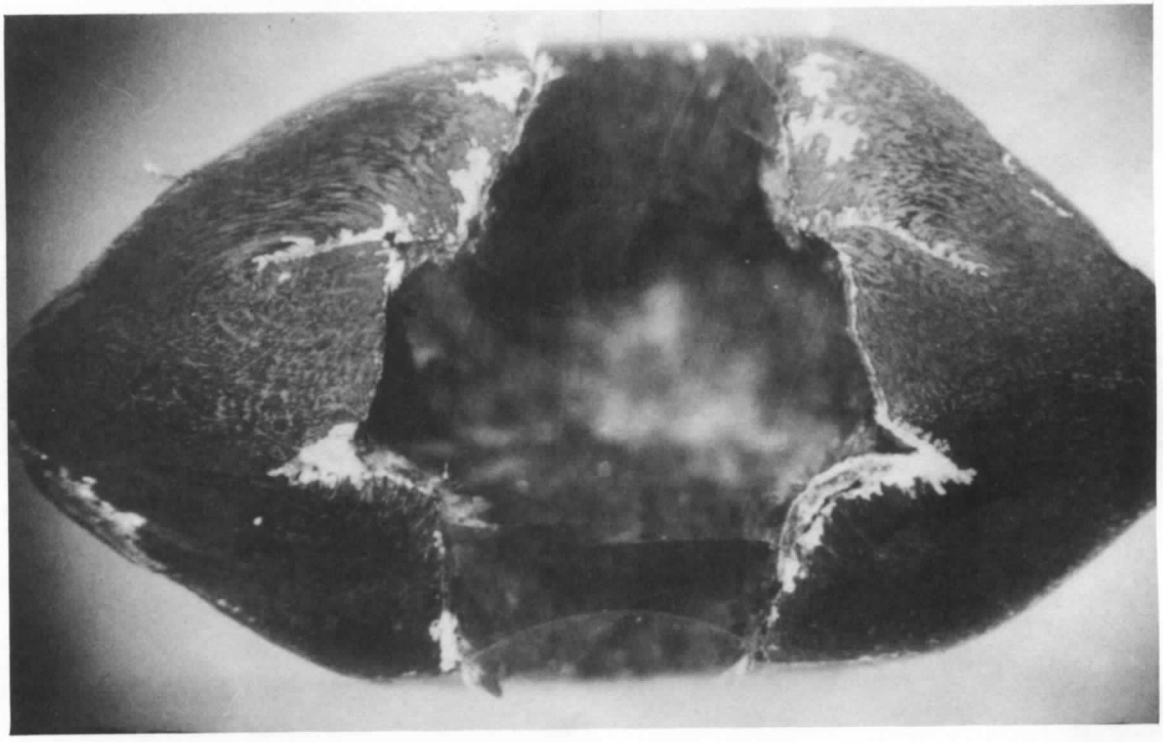
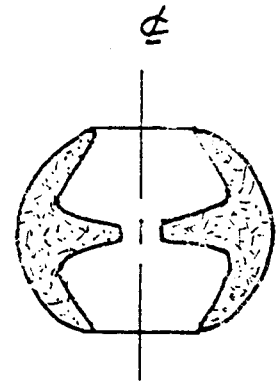
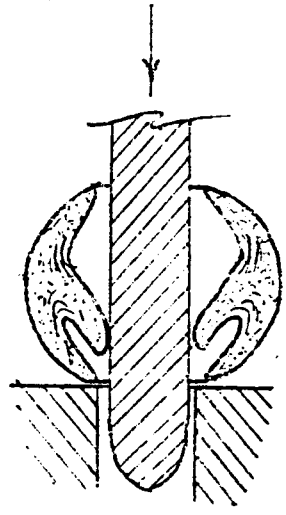


Figure 7. Top. Half of axial section of bronze spindle whorl stained with $K_2Cr_2O_7$ solution to show macrostructure. 15x.

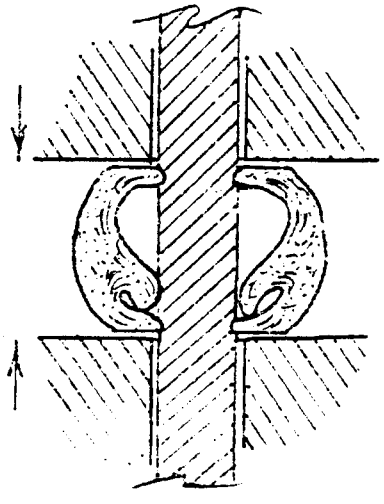
Figure 8. Bottom. Axial section of bronze spindle whorl stained with $K_2Cr_2O_7$ solution to show macrostructure. 15x.



(a) Whorl, as-cast (note equiaxed macrostructure).



(b) Wooden spindle is forced through central orifice or whorl (note deformation of macrostructure at points of flexure).



(c) Ends of whorl are forced inwards by pressing or hammering. Whorl is clamped firmly on spindle.

Figure 9. Drawing showing reconstructed shape of as-cast whorl (a) and subsequent deformation during spindle attachment (b and c).

REPRESENTATIONS OF THE COSMOS: A COMPARISON OF THE CHURCH OF SAN CRISTOBAL DE PAMPACHIRI WITH THE CORICANCHA DRAWING OF SANTACRUZ PACHACUTI YAMQUI SALCAMAYGUA

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The creation of Inca style art and architecture did not cease abruptly with the Spanish conquest of the Andes. Native craftsmen participated in the rebuilding of Cusco and in the construction of the new city of Huamanga (now Ayacucho) founded in 1539. Rebel builders fortified Ollantaytambo and erected the Vilcabamba stronghold. Both Christianized Indians and **hechiceros** constructed numerous provincial churches during the century after the collapse of Tawantinsuyu. These include San Cristóbal de Pampachiri, described in this paper. Indian iconographic themes were often incorporated into the decoration of such churches, syncretized with Christian symbols so as to escape the censure of the **extirpadores de idolatrías.**

San Cristóbal is in the town of Pampachiri, a district capital of Andahuaylas Province, Apurímac Department, Peru. The geographical coordinates of its main plaza are 73° 33' W, 14° 12' S. The high relief sculpture surrounding the main portal of its church constitutes one of the best preserved, most elaborate, and least known examples of neoinca art. This paper examines the evidence which indicates that the entrance dates to the latter part of the sixteenth century or the beginning of the seventeenth and then compares its arrangement and iconography with that depicted in the contemporaneous drawing of Coricancha, Cusco, as illustrated by Santacruz Pachacuti Yamqui Salcamaygua (1879 [1613]).

Extant examples of neoinca sculpture are rare and most recognized works are to be found *in situ* in Cusco and Ayacucho (Kauffmann Doig 1965: *passim*; Gisbert 1980: *passim*). Among the most interesting and best preserved are the staircase and column heads of the Casa Velarde Alvarez, formerly the Casa de Cossio (Bustamante 1953:40; Kauffmann Doig 1965:21) and now the Escuela de Bellas Artes, which occupies the north side of Ayacucho's central plaza, the Parque Sucre (Kauffmann Doig 1965: Lámina I). Built in the mid-sixteenth century, probably for one of the Marqueses de la Totora (Ibid:21), this house utilizes Inca style **almohadillado** masonry in the plaza entrance (Ibid:19, Lámina II; 22, figura 1; 45, figura 5). **Almohadillado** blocks are the well-known Inca ashlars whose joins are emphasized by steeply beveled edges. The Casa Velarde Alvarez also contains a well preserved **Amaru** staircase in which the body and two heads of the serpent make up the stair rails with the effect that the form of this supernatural being is incorporated into the decorative scheme of the first patio (Ibid:34-35, Lámina V). Heavy columns support the second story **corridor.** Their capitals are decorated in the flat, conventional, static, and rather crude Inca manner and depict snakes, lizards, and felines (Ibid:28-34, figuras 2, 3 & 4).

At the rebuilt chapel of Quiñuarpata, also in Ayacucho, a life size stone head in neoinca style has been tenoned into the interior wall at the right hand side of the main door, as one enters. It is now a holy water font with the shallow depression at the top holding the liquid. The facial features have been carved in the same flat manner as the staircase and capitals of the Casa Velarde Alvarez. It was probably part of an earlier shrine on the site. This

head can be distinguished from work executed before the Spanish conquest by the inscription in the Latin alphabet which it bears.

Two neoinca capitals in the collections of the Krannert Art Museum at Urbana, Illinois have been identified by Alan R. Sawyer (Sawyer 1975:170, 172; Figs. 269, 270). Their exact provenience is unknown, but they are said to have come from a chapel in highland Peru. Stylistic characteristics of the Pampachiri Church allow us to classify its façade with the examples of neoinca stone carving mentioned above. Like the Casa Velarde Alvarez columns, the Quiñuarpata head, and the supports from the unknown highland chapel, the Pampachiri sculpture is executed in high relief rather than in the full round. The rendering is stiff, conventionalized, and almost hieratic in appearance. Features are flat, in contrast to the rounded cheeks and pudgy chins of baroque and rococo faces.

Unfortunately, only one of the comparative examples I have mentioned, that of the Casa Velarde Alvarez, has been firmly dated, but all are from the early colonial period. It is certain that the Pampachiri sculpture, which resembles these works in style, does not represent an example of preconquest art removed from its original context and later set into the façade. There is a good fit between the elements of its decorative program and the central Roman arch this program surrounds. The true arch is a European architectural device, unknown in prehispanic Peru.

The Pampachiri façade is unlikely to have been executed after 1651 because churches in the central Andes that were built or reconstructed during the latter half of the seventeenth century are decorated in the more sophisticated Metropolitan style (Kubler and Soria 1959: 91-98). Therefore, on the basis of stylistic analysis alone, the Pampachiri façade appears to have been erected sometime between 1540 and 1650.

Pampachiri, unlike nearby Soras (Monzón 1965 [1586]:221), is apparently not a prehispanic town that has survived through the colonial period to the present day. It was one of the new communities that resulted from the reductions ordered by Viceroy Toledo in the 1570's and carried out by his successor Martín Enríquez (Levellier 1925:168-169, 178-179). These reductions were official attempts to lower the number of Indian settlements and concentrate the rapidly declining native population in a few locations where they could be supervised (Matienzo 1910 [c. 1573]: Capítulo 14; Cook 1981: *passim*). These reductions, in order to have legal existence, had to have the essential buildings of a Spanish town, including a central square with streets and houses laid out around it in a grid plan, a **cabildo** or town hall, a jail, and a church. Construction of San Cristóbal probably began before 1581, since Pampachiri is listed as one of the reductions of the Repartimiento de Andahuaylas during the rule of Viceroy Enríquez (1581-1583).

Other evidence narrows the span of possible construction even further. Pampachiri's scandalous curate, Juan Bautista Aludán, is mentioned twice in the well-known chronicle of Felipe Guamán Poma de Ayala (1980 [1613]:536, 696). Among those who protested against and suffered from the physical abuses perpetrated by the evil priest were Indian painters presumably at work on church murals (Kubler and Soria 1959:322-323). Perhaps these painters also polychromed the Pampachiri arch. Traces of red and white color remain on the figures. Unfortunately, no murals earlier than the 18th century can be seen at

the church today, but a cursory examination of the building's fabric indicates that the adobe walls have been rebuilt many times. From documentary evidence, therefore, it appears that the church at Pampachiri was essentially complete by 1613, the year in which Guamán Poma finished his chronicle.

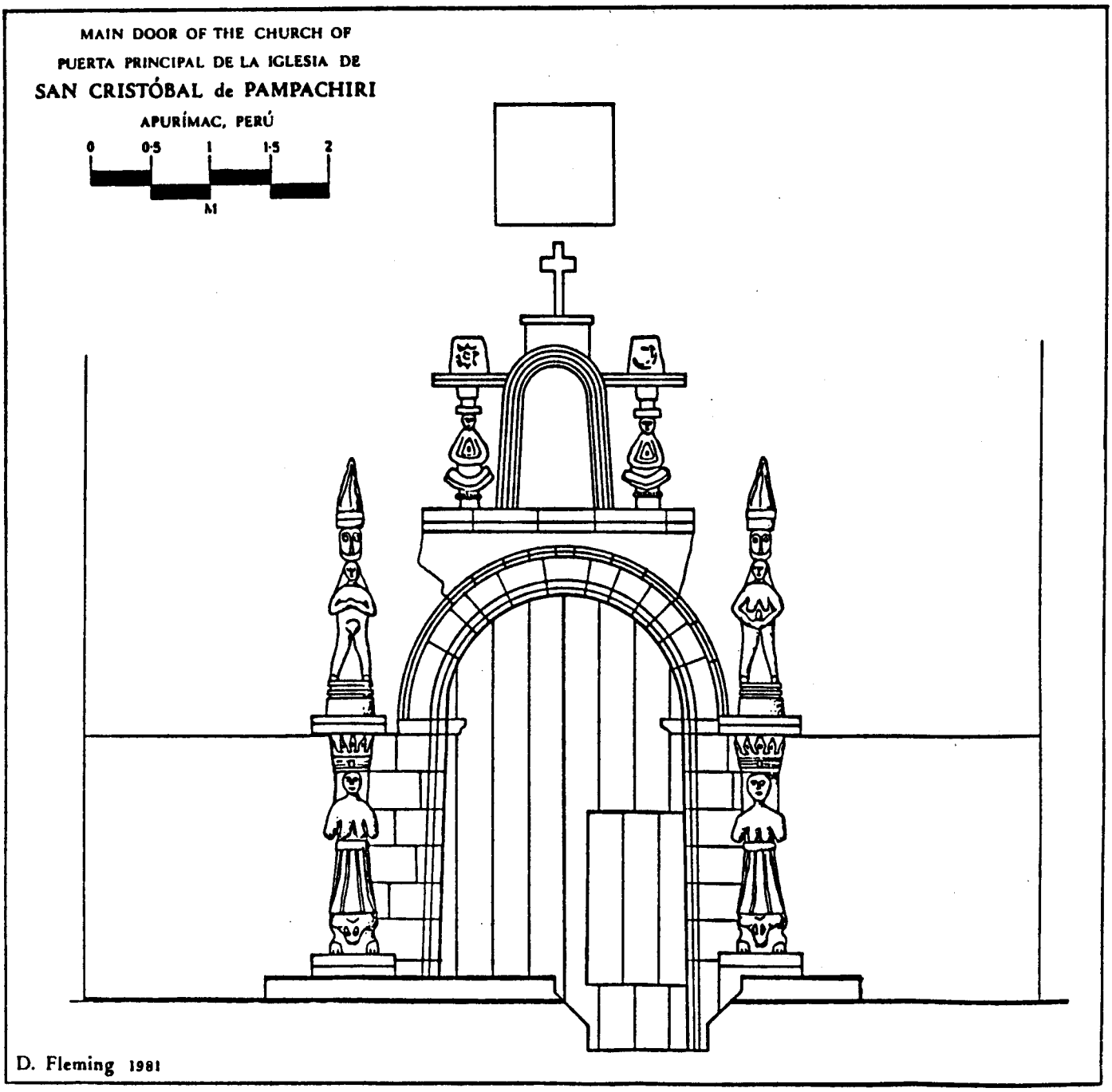
In plan, San Cristóbal de Pampachiri resembles the church built upon Inca ruins at Vilcashuamán. This building was erected circa 1580 according to Arq. José María Galvez Pérez (personal communication, August, 1980). Construction in about 1580 is most likely for Pampachiri, as well, in view of the timing of Toledo's reductions and the active participation of many local Indians in the **Taki Oncoy**, a nativistic and millennarian religious and political movement active from the mid-1560's to the mid-1580's. More than 150 **huacas** were discovered and destroyed in the neighboring province of Soras by Cristóbal de Albornoz, an **extirpador de idolatrías** who traveled in the valley during the 1570's and again in the 1580's (Millones 1971:4/3, 4/17, 4/18, 4/19, 4/20, 4/23, 4/22, 4/24, 4/28,), assisted for part of this time by his **alguacil**, Guamán Poma (Poma de Ayala 1980 [1613]:638-640). Albornoz destroyed the great religious complex at Chicha, across the Río Soras from Pampachiri (Millones 1971:4/18, 4/19, 4/23). Convicted **hechiceros** were commanded to work on the new churches (Millones 1971: *passim*). Ironically, at least one church, that at Soras, was built upon the remains of an important Inca building which was probably the home of a major **huaca**.

Although I have not yet encountered documentation which would give firm dates for the constructional phases of the church of San Cristóbal de Pampachiri, the combined evidence that does exist makes it reasonable to assume a date of around 1580 for the construction of the church and the execution of the carved stone façade. I do not, however, despair of finding good documentation for the Pampachiri church, because parish records for Apurímac Department remain largely unstudied.

What follows is a description of the various motifs making up the entrance design and some suggestions for an interpretation of their iconographic meaning (Figure 1). At ground level on each side of the arch there are representations of the heads and front paws of a pair of felines, probably pumas. These supports bear direct comparison with those in the Krannert Art Museum which are human faces with feline ears (Sawyer 1975:170,172; Figs. 269,270). Teresa Gisbert includes illustrations of two similar anthropomorphized felines in her important work, *Iconografía y mitos Indígenas en el Arte*. One is to be found at the church of Santiago de Pomata (Gisbert 1980:62, foto 60). The second is part of the Casa del Balcón in La Paz (Ibid:60, foto 61). In both of these cases, as well as at Pampachiri, the man-cats occupy the lowest position at either side of an entrance. Gisbert mentions that the Casa de los Condes de Arana in La Paz and the Church of Quispicanchis also have felines represented frontally and in the same relative positions (Ibid:62).

Above each feline there is a woman who wears a skirt which hides her feet, but who is nude from the waist up, revealing pendulous breasts. The women's arms bend backwards at the elbows in anatomically unnatural positions. Their faces are carved in the same flat style as the Quiñuarpata head. The females wear crowns which support pedestals. Standing on the right pedestal as one enters the door there is the figure of a nude woman holding a round object in her hands, over her pubic area. The woman's head supports another highly

Figure 1. Drawing to scale of the façade of the Church of San Cristóbal de Pampachiri, Andahuaylas Province, Apurímac Department, Peru.



stylized head which in turn supports an entablature topped by a cone-shaped decoration similar to those found on many other churches in Apurímac.

On the left of the entrance arch, above the other skirted female there stands the figure of a male, identified as such by his lack of breasts. He is also nude, and holds his hands together at the center of his chest. Unlike his female companion, he does not clasp an object. His head also supports a stylized face, entablature, and half-cone decoration.

Surmounting the arch itself there is an entablature below a smaller blind arch with a geometric figure on either side. These figures are seated with crossed legs. Their arms come together at the waist, forming a trapezoid with the shoulders. At the center of their chests there is a carved triangle with a dot in the middle. The figures fit neatly into a diamond-shaped outline.

Above the heads of these figures there are blocks of stone which support another entablature. Above this entablature there is a representation of the sun at the left and the crescent moon at the right, or perhaps of two crescent moons. This part of the façade has suffered deterioration and it is difficult to make out its symbols. Above the blind arch is a cross supported by a horizontal element.

The Pampachiri entrance is important because it represents a complete design in which indigenous symbols are syncretized with Christian ones in a manner which reveals the unknown designer's understanding of both native and Christian cosmologies. In searching for comparisons I was immediately struck by a high degree of similarity with the famous drawing of the **Altar Mayor** at Coricancha made by Joan de Santacruz Pachacuti Yamqui Salcamaygua (1879 [1613]) (Figure 2). Parallels exist in both the individual elements represented and in their arrangement. The Santacruz Pachacuti Yamqui drawing is more detailed and contains a certain amount of written explanation in Quechua, Aymara, and Spanish. These captions have been omitted from Figure 2. It is thought that the drawing is more a diagram of the Andean cosmos than an actual picture of the Coricancha shrine, although the arrangement of the "altar" itself would have been as much a material representation of Inca cosmic reality as elaborate baroque **retablos** were representations of the Catholic universe.

Produced circa 1613, Pachacuti Yamqui's drawing is roughly contemporary with the Pampachiri façade. It cannot be accepted as a depiction uninfluenced by Christian thought since Pachacuti Yamqui was a professed Catholic who produced the representation eighty years after the pillaging of Inca Coricancha. Nevertheless, the existence of a similar, but simpler example, carved in stone, and placed in an explicitly religious context, suggests that abstract cosmology was indeed given visual representation at Coricancha and at other Inca temples. The mental map of the universe found tangible expression. This map was remembered and understood by the Christian Pachacuti Yamqui eight decades after the Spanish conquest. It was still depicted in permanent materials, even in a Christian church in a place, and at a time, when an intelligent and active **extirpador de idolatrías** was at work. The neighboring Soras Indians who were persecuted by Cristóbal de Albornoz for their involvement in the **Taki Oncoy** were cognitively equipped to appreciate the full meaning of the Pampachiri façade.

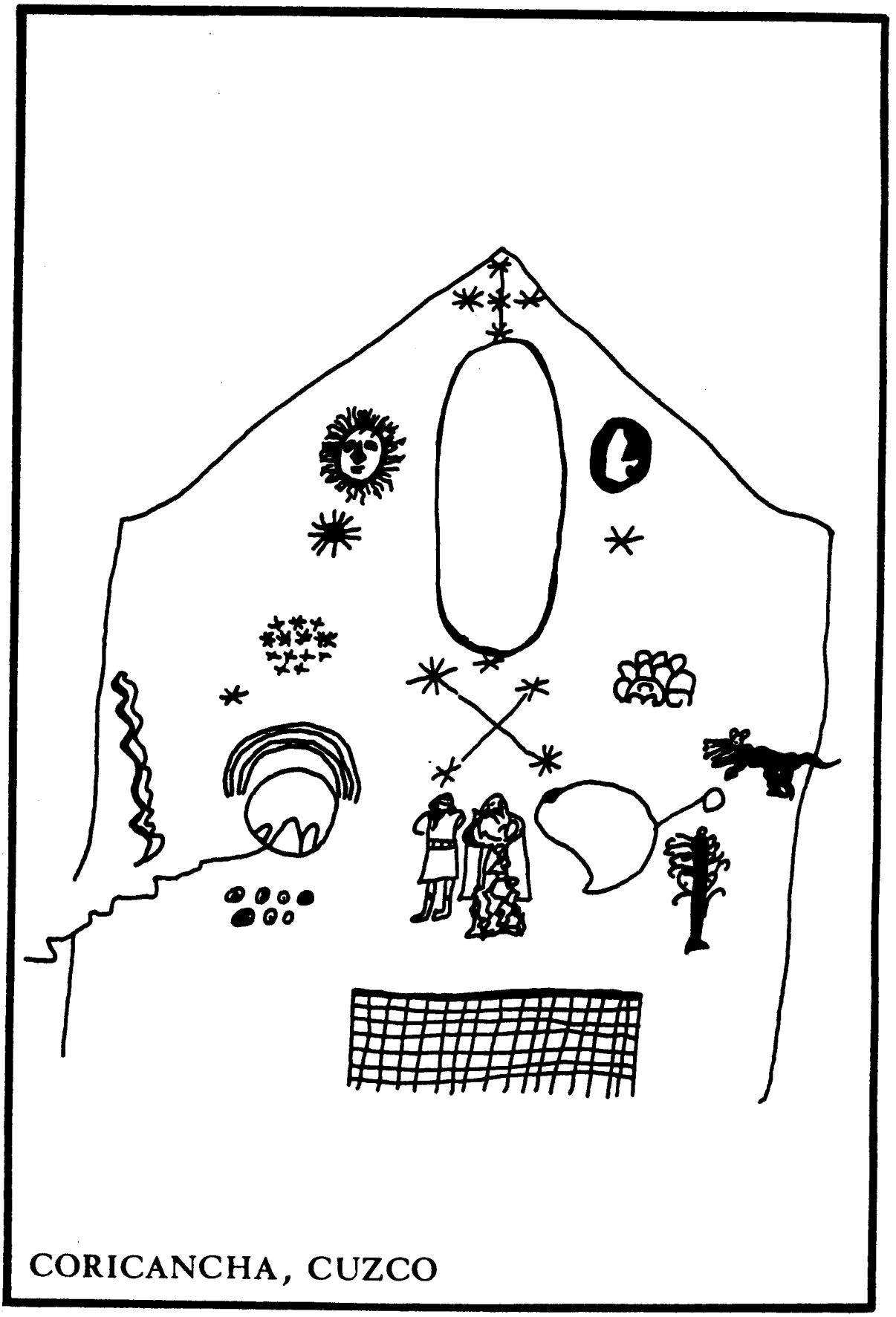


Figure 2. Drawing of the Altar Mayor at Coricancha, Cuzco, by Santacruz Pachacuti Yamqui Salcamaygua (1879 [1613]).

John Earls and Irene Silverblatt's ethnographic investigations in the community of Sarhua, Ayacucho Department (Earls and Silverblatt 1978); Billie Jean Isbell's analysis of children's drawings from Chuschi, Ayacucho Department (Isbell 1978:207-215); Douglas Sharon's study of Peruvian shamanism (1978:93-100 & *passim*); Gary Urton's astronomical studies at Misminay (Urton 1981:132-133, 202-203 & *passim*); and E. Pinto Ramos' examination of Tomanga canal cleaning rituals (Pinto Ramos 1970, cited in Urton 1981:202-204) reveal that many of the symbols in Pachacuti Yamqui's drawing remain meaningful to the people of the Central Andes.

A point by point comparison can be made between the Pampachiri sculpture and the drawing. Starting at the base of the façade we see the two puma heads. On the Pachacuti Yamqui drawing the feline is represented in its constellational aspect of **chuqui chincay**. Among other things, pumas are symbols of the **apu-kuna** or **auki-kuna**, who are important mountain spirits that can affect the fate of men and women. In the 1940's, Mishkin reported that in the Quechua community of Kauri, the most active spirit was Ccoa, the malevolent sky cat. Ccoa caused lightning, thunder, hail, and storms (Mishkin 1946: 463). In another aspect, Ccoa is transformed into Santiago, the patron of the Spanish conquistadores and an important saint of the Pampachiri Church, the patron of the community's subdominant moiety (Barnes 1984). The anthropomorphized cat has a long iconographic history in the Andes. It can be traced back to Chavín times, at least, but, of course, it is impossible to reconstruct all the permutations of meaning which this symbol underwent over time.

It is useful to remember that effective religious syncretism meant that Catholic churches could have been decorated with symbols of the prehispanic religion in ways that would allow these symbols to have Christian meaning to Catholic viewers as well as Andean value to practitioners of the old religion. Such duality of meaning was understood and even manipulated by sophisticated members of the Spanish clergy.

A clear and explicit acknowledgment of the double, or even triple interpretations which could be made of identical symbols is found in the frontispiece to the 1638 and 1639 editions of Calancha's *Chronica Moralizada* (Calancha 1638-1639). In the left hand corner of the illustration the sun and moon are represented in the heavens above an Augustinian friar. The moon is superscribed "Ecclesiae" and the sun marked "Sol Justitiae Xpus Deus noster". On the right hand side of the illustration there is an Indian but with the moon above his head marked "Sacrificemus Reginae Caeli Jer. 44" and the sun marked "Adorabunt ad orbum Solis Eze. 8". The biblical verses refer to the disastrous consequences of moon and sun worship by the ancient Hebrews and, by analogy, to the perceived wickedness of the Indian's reverences. The sun, the moon, and other natural objects could be employed as Christian symbols in full realization of their values in indigenous terms and their parallel values in other systems of religious thought.

To return to the feline representations, in Christian terms the lion is the symbol of power and control, the transmitter of the word of God (Revelation 5:5), and the symbol of Matthew the Evangelist. As a symbol of power it appears on the banners of England, Norway, León, and other European states. Interestingly, this meaning is ultimately derived, via early Christian iconography, from the man-lion of Assyria with its associations of power and statehood.

The two women with crown and skirt are not represented in the same manner by Pachacuti Yamqui. These figures are still venerated by local people who offer them floral wreaths. Their iconographic meaning is uncertain, but it is possible that they represent **Pacha Mama** and **Mama Cocha**, sometimes syncretized respectively with Mary the Mother of Jesus (Gisbert 1980:17-22) and Mary Magdalene. **Mama Cocha** may be subsumed within the Magdalene's identity because both figures have water associations. The bare breasts of the Pampachiri pair conjure images of fertility and nurture. Their crowns may be symbols of sanctity. Interestingly, a pair of women who took on the identities of Mary the Virgin and Mary Magdalene were important figures in the **Taki Oncoy** (Millones 1971:2/46, 2/62). We can speculate that the Indian women claimed some of the attributes of the female earth and water deities.

The most striking parallel between the Pampachiri façade and the Pachacuti Yamqui drawing is in the figures of the man and the woman. In Andean art, the female is normally at the right of the male, from the viewer's perspective, as represented by Guamán Poma (Adorno 1979). This placement contrasts with the usual arrangement in Catholic churches in which the altar dedicated to the female principle, as represented by the Virgin Mary, is either at the viewer's left, or behind the main altar. In the Coricancha drawing, the woman is making an offering by pouring liquid on the ground. At Pampachiri the round object held by the woman is possibly meant to represent a vessel or a fruit. If the object is seen as a vessel, the woman is in the act of pouring a libation, a ritual act that has great importance throughout the Andes. If the object is seen as a fruit, that, combined with the figure's nudity, would allow it to be equated with Eve. The male figure, with his hands crossed at his chest as at Coricancha, could double for Adam. The First Parents are very popular figures in early colonial art, probably because of their innate associations with the male and female elements of the universe and because they represent the marital bond. It is possible that in colonial times the Pampachiri figures might have been dressed in real cloth as were some Inca statues and as the statues of the saints are to this day. The Coricancha male and female are represented as dressed, rather than nude, and are in a different medium.

In the Pachacuti Yamqui drawing the man and woman stand on or above a rectangle subdivided into 119 squares. This rectangle is marked "**collca pata**", a phrase which is difficult to translate but which refers to a storehouse or storehouses (**collca**) and a terrace or terraces, or platforms, or the right angle edges formed by the floors and vertical walls of terraces or platforms. At Pampachiri the "**collca pata**" may be represented by the stone entrance threshold.

It is difficult to interpret the faces above the man and woman. At a roughly similar position in the Coricancha drawing there are representations of the summer and winter sky.

The two seated figures probably represent **Chasca collor**, Venus of the morning, or the spiritual Grandfather, "**achachi uyuri estrella luzero de la mañana**" according to Pachacuti Yamqui who gives Quechua, Aymara, and Spanish versions of the morning star's name, and **Choquechinchay**, Venus of the evening, the Grandmother, or "**apachi oroi**". Pachacuti Yamqui again gives the name in three languages. Samuel Lothrop has pointed out that the representations at Coricancha may not have been exactly as Pachacuti Yamqui drew them, but rather, might have been conventionalized Inca cosmological symbols.

Lothrop represents the aspects of Venus as "God's eye" diamond shapes with the same outline as the Pampachiri figures (Lothrop 1938:36, Figure 11).

As at Coricancha, the moon, and perhaps the sun, are placed to either side of an oval shape. We have already seen how the sun and moon have been incorporated into a Christian design. There are numerous parallels with other colonial churches in Peru and Bolivia.

The blind arch is of great importance in the iconographic program. In its ovoid shape it is reminiscent of the gold disk representing Viracocha which, according to Pachacuti Yamqui, was affixed to the wall of Coricancha in the same position relative to the man and woman, the morning and evening stars, the sun and the moon and the cross of Orion constellation as is the Pampachiri blind arch. Urton (1981:202), following Zuidema (1977), suggests that the ovoid shape itself is symbolic of Viracocha the Creator. The cruciform five stars of Orion, the **orcorara**, which surmount the Viracocha oval in Santa Cruz Pachacuti's drawing are transformed into a Christian cross at Pampachiri.

It has already been pointed out that the Pachacuti Yamqui drawing exhibits a greater number of cosmological elements than the Church of San Cristóbal. Missing at Pampachiri are "**saramanca, cocamanca, chacana en general**", "the maize pot, the coca pot, cross-things in general", a representation which includes the Southern Cross (Lehmann Nitsche 1928) and cruciform constellations in general (Urton 1981:132); "**camac pacha**", the Maker-Earth; and the river Pillcumayo, a legendary Inca origin place, probably of little importance in the Soras Valley. Also absent are the "**arco de ciel**" or **cuychi**; the Eyes of Abundance - **ymaymana ñauraycunapñawiñ**; lightning or "**Chuqueylla yllapa**"; the "**puqyo**" or spring; and "**mallqui**" ('tree', with connotations of 'ancestor').

The presence of at least one female figure on each side of the entrance prevents us from considering that the Pampachiri Church is arranged with the male/female bipolarity which Zuidema (1977:263-264), Earls and Silverblatt (1978:318), Sharon (1978:95-97), Isbell (1978:207-210), and Harrison (1982:75-76) have seen in the Pachacuti Yamqui drawing. However, it is probable that the four-tiered genealogical scheme recognized by these authors and illustrated by Perez Bocanegra (1631:614) and reproduced by Zuidema (1977:249, Figure 2) is also exemplified at Pampachiri. The sun would be the Great-grandfather, the morning and evening stars the grandfather and grandmother, the earth the father and/or mother, and human beings the children. The unifying pattern of the Andean universe, recognized by Earls and Silverblatt (1978:318-321), appears to be present here, as at Coricancha. Viracocha, symbolized by the oval, represents the universe itself. Celestial order is embodied in the stars. The terrestrial domain would be indicated by the Pachamama and Mamacocha figures. The man and woman stand for the social sphere of the family. The agricultural sphere might be represented by the threshold *cum* **collca pata**.

However, two of the three cosmic mediators recognized by Zuidema are absent. These are the rainbow which mediates between the sky and the earth and lightning which also mediates between the upper world and this world (Isbell 1978:209-210) with only a pair of cats representing **choquechinchay**, or the supernatural feline which goes between the underworld and the upper world, passing through this world (Zuidema 1977: *passim*).

In spite of these absences there are important and genuine points of comparison between the façade and the drawing, as we might expect in two contemporary representations of the Andean universe. These points encourage us to examine the corpus of colonial art for additional cosmic maps.

Acknowledgments

I would like to thank Dr. David Fleming for companionship in the field and preparation of Figure 1. Figure 2 is a tracing from a photograph of the original manuscript no. 3169 in the Biblioteca Nacional, Madrid. The written explanation provided by Santacruz Pachacuti Yamqui has been omitted from the tracing. I would also like to thank EARTHWATCH and the following volunteers: P. Barbanel, M. Blanc, R. Brown, B. Drummond, S. Eldredge, S. Eyring, L. Hefferin, N. Howard, M.E. Hunt, A. Hutchison, J. Levin, S. Mattner, M. Monroe, S. Olafsen, J. Preston, M. Rogers, L. Schisgall, Dr. B. Ward, J. Wilson, and S. Wilson. Thanks are also due to C. Augusto Morales D., an archaeologist with the Peruvian Instituto Nacional de Cultura who was an unfailingly wise source of advice both in Lima and in the field. Oscar and Anita Weiss and their family offered friendship and hospitality in Lima. Victoria Sotelo provided food for the body and companionship for the spirit. The people of Pampachiri deserve thanks for their help and understanding. Sabina Campbell suggested that the literature on South American shamanism links felines with altered states of consciousness. The *Vocabulario de la lengva Aymara* by Bertonio, which I consulted, is part of the Rare Books Collection of the Olin Library, Cornell University. The edition of Calancha's *Chronica moralizada* which I used is part of the collection of the British Library. A copy of Perez Bocanegra's *Ritval formulario* reposes in the John Carter Brown Library, Providence.

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3RD ANNUAL MEETING

NORTHEAST CONFERENCE ON ANDEAN ARCHAEOLOGY AND ETHNOHISTORY

University of Massachusetts, Amherst

October 27-28, 1984

PROGRAM

Friday, October 26, 1984

8:00-10:30 P.M.	Special showing of a new film MOUNTAIN MUSIC OF PERU by film maker John Cohen who will introduce the film and answer questions about it. He will also bring his film QEROS: THE SHAPE OF SURVIVAL in the event there is interest in seeing it as well.
	Thompson Hall, Room 106

Saturday, October 27, 1984 [all talks will take place in Thompson 106]

8:45-9:30 A.M.	Coffee and registration, Machmer Hall W-11 (no fee, no advance notice required)
9:30-10:00	Richard Daggett (University of Massachusetts)
	THE EARLY INTERMEDIATE OCCUPATION OF THE NORTH CENTRAL COAST: AN EMERGING PERSPECTIVE
10:00-10:30	Izumi Shimada (Harvard University)
	ANCIENT MINING AND METALLURGY ON THE NORTHERN NORTH COAST OF PERU
10:30-11:00	Coffee Break
11:00-11:30	Thomas C. Patterson (Temple University)
	PRE-INCAIC CLASS AND STATE FORMATION IN PERU
11:30-12:00	Patricia Netherly (Dumbarton Oaks and UMass)
	THE PROCESS OF STATE FORMATION IN THE ANDES: A VIEW THROUGH TIME
12:00-2:00 P.M.	Lunch Break
2:00-2:30	John Topic (Trent University)
	EVOLUTION OF ARCHITECTURAL FORMS IN HUAMACHUCO
2:30-3:00	Coreen Chiswell (Trent University)
	ANALYSIS OF ORGANIC REMAINS FROM HUAMACHUCO COLCAS
3:00-3:30	Lawrence Kaplan (University of Massachusetts-Bosto
	THE ARCHAEOLOGICAL BOTANY OF A HIGHLAND ANDEAN SITE AT TANTAMAYO, HUANACO, PERU
3:30-4:00	Coffee Break
4:00-4:30	Michael Malpass
	TERRACE SYSTEMS OF THE COLCA VALLEY, PERU: A PRELIMINARY REPORT

4:30-5:00 John V. Murra (Institute of Andean Research)
LARGE SCALE COCA-LEAF GROWING IN EASTERN QOLLASUSU

5:00-5:30 Gary Urton (Colgate University)
THE HISTORY AND GEOGRAPHY OF ORIGIN PLACES IN PACARIQTAMBO

Saturday evening, October 27, 1984

8:00-11:00 Party for conference participants--details to be announced later

Sunday, October 28, 1984 [all talks will take place in Thompson 106]

9:00-9:30 A.M. Coffee Machmer W-11

9:30-10:00 Jane Feltham
THE ARCHITECTURE OF NIEVE-NIEVE AND ITS IMPLICATIONS FOR AN UNDERSTANDING OF THE FUNCTION OF CENTRAL COAST STRUCTURES

10:00-10:30 Elzbieta Zechenter (UCLA)
DIFFERENTIATED SUBSISTENCE MODE OF THE PERUVIAN COTTON PRECERAMIC PERIOD

10:30-11:00 Coffee Break

11:00-11:30 Thomas Lynch (Cornell University)
THE SALAR DE PUNTA NEGRA: CLIMATE CHANGE, WATER BUDGETS AND SETTLEMENT AROUND A FORMER FRESH-WATER LAKE [IN NORTHERN CHILE]

11:30-12:00 Dwight Wallace (SUNY-Albany)
TOPARA

12:00-2:00 P.M. Lunch Break

2:00-2:30 Monica Barnes (Community College of Allegheny County)
REPRESENTATIONS OF THE COSMOS

2:30-3:00 Susan Niles (Lafayette College)
EARTH MOTHER, EARTH FATHER: ANCIENT SHRINES IN CONTEMPORARY ANDEAN WORSHIP

3:00-3:30 Robert Sonin
AN ANALYSIS OF TWO TAIRONA PENDANTS

3:30-4:00 Stuart Arnold
ASPECTS OF CASTING PRACTICE IN PREHISPANIC PERU

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