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Research Reports Andean Past 6

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CURRENT RESEARCH IN ANDEAN ARCHAEOLOGY

Editors' Note

In this issue of *Andean Past* we introduce "Current Research in Andean Archaeology", a new feature. For many years, *American Antiquity* published similar reports, covering not just the Andes, but all of the Americas. However, no such reports have been published in *American Antiquity* since 1993 and scholars have been deprived of a means of quick dissemination of recent findings in a first-tier professional journal. Although plans for posting current research reports on the *American Antiquity* website were announced some years ago, they are still in an experimental phase. Hence, for the past few years, Daniel H. Sandweiss has maintained a "Current Research" section on our *Andean Past* web site (http://kramer.ume.maine.edu/~anthrop/Andean_p/html). What follows is an edited version of these postings from their beginning to mid-summer, 2000. In contrast to the old *American Antiquity* section, *Andean Past* "Current Research" reports may be illustrated and may include a limited number of published or distributed references. In these respects, our new section is similar to the short "Scientific Correspondence" section of *Nature*. However, unlike the scientific letters to *Nature*, *Andean Past* "Current Research" reports are not subject to peer review. New reports should be sent to Dan Sandweiss at the University of Maine, Orono. (See inside front page for addresses.)

Daniel H. Sandweiss
Monica Barnes

Current Research (1997-1999)

ECUADOR

Pimampiro Project

Archaeological test excavations under the direction of Tamara L. Bray (Wayne State University, e-mail tamara.bray@wayne.edu) began in 1997 at the site of Shanshipampa in the Pimampiro District of northern highland Ecuador. Since 1991 this district, described in sixteenth century sources as a gateway to the eastern lowlands and an important multi-ethnic trade center, has been the focus of a regional study by Bray. Shanshipampa is named after the present local community. With the help of the Wayne State University Archaeological Field School and personnel from the Instituto Nacional de Patrimonio Cultural, Bray mapped the site and tested a range of features during the 1997 field season.

On the basis of ethnohistoric data, previous archaeological work, and information provided by local informants, Shanshipampa has been tentatively identified as the site of Chapí. Late sixteenth century sources indicate that Chapí once functioned as an important commercial center for highland and lowland merchants, and housed a multi-ethnic population that included affiliates of eastern *montaña* groups. The site was abandoned in the seventeenth century and memory of its location lost to local people thereafter.

Excavations in 1997 focused on the upper portion of the site, which, according to local residents, had only been clear of forest in the past 80 years. The landowner indicated that the area was used as pasture and had never been plowed. Archaeological features include terraces, small circular mounds known locally *tolas*, long linear mounds, and widely dispersed petroglyphs. Investigations in 1997 concentrated on

the parallel linear features, their associated terraces, and one of the *tolas*. The linear features run perpendicular to the contour of the slope of the site, with their uphill ends abutting unfaced terrace risers. The linear mounds range in width from 3 to 6 meters, are approximately 1 to 1.8 meters high, and vary from 25 to 60 meters in length. There is an upper and a lower tier of these linear mounds, which are spaced at 12 to 16 meter intervals. Test excavations indicate that these mounds are comprised of piled colluvium with considerable amounts of ceramic materials mixed into the upper levels. Testing between the linear mounds yielded substantially lower densities of cultural materials. While these features remain somewhat enigmatic, their association with terraces, their concentration in the lower elevations of the site, the lack of associated artifacts, combined with ethnographic information on indigenous farming practices suggests that they may have had an agricultural function, possibly relating to the division of fields.

A nearby oval mound, c. 12 by 23 meters and 2 meters high, was also tested. Several possible hearths were found in its middle and lower levels. These features, in conjunction with the ceramic evidence and the number of broken grinding stones (*manos* and *metates*) recovered, suggest a domestic function for this mound. On the terrace abutting the mound, immediately to the east, a dome-shaped feature of white clay with a vented, box-like structure in its center (56 cm x 52 cm x 83 cm deep) was uncovered (Figure 1). The walls of the rectangular central portion of the feature were nearly vitrified, probably during exposure to extremely high temperatures. Preliminary review of the literature suggests the possibility of a furnace associated with metal-working. While gold ornaments are relatively common in this region, we have no reported finds of metallurgical production sites anywhere in the area. This makes the identification of this feature very tentative, but also potentially very important. Initial sorting of the ceramic materials from the 1997 excavations suggests the presence of

Caranqui, Capulí, and Panzaleo style pottery dating principally to the late prehistoric period (800-1400 A.D.), as well as some previously unrecorded blackware types.

In 1999 work continued at Shanshipampa with the support of the National Science Foundation and the Wenner-Gren Foundation. This phase of the research is an interdisciplinary endeavor. Project Co-Principal Investigator Cristóbal Landázuri of the Pontificia Universidad Católica del Ecuador (Quito) directs the ethnohistorical component. Work in local archives was completed in 1999 and analysis of information on changes in local production systems, political structures, demographics, and ethnicity with the advent of colonial rule is underway.

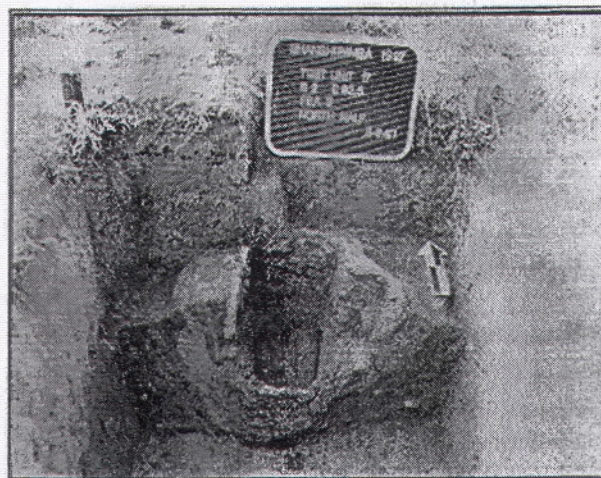


Figure 1. Domed pit feature with rectangular central hollow that exhibits a side vent and vitrified interior.

In 1999 Bray continued test excavations at Shanshipampa with the aid of Ecuadorian and American students from several universities including Wayne State. During that season, a magnetometer survey of the site was made, and the topographic map of the site tested. Donald Johnson of IMA Consulting, Minneapolis, Minnesota conducted the geophysical work. Through excavations, Bray's team identified several buried features including a double-

coursed stone wall, an extensive cobble and sherd floor, and a number of possible house terraces. A number of large, complete storage vessels were encountered *in situ*.

Among the most interesting results of the 1999 season was the identification of at least three types of mortuary practices at Shanshipampa. The first is fairly elaborate, and involves the placement of a burial pit in the center of a stone ring that was subsequently covered by a low mound with a circular plan (Figure 2). While the human remains were not generally preserved in these features, one of the mounds did produce the posterior dentition of a single individual interred with a complete Panzaleo pot (Figure 3). A single radiocarbon assay of burnt material within the vessel produced a date of 250 B.P. \pm 100 (Beta 136125), suggesting a fairly recent age for this burial.



Figure 2. Circular stone ring, 3 m in diameter, surrounding burial pit (Feature 5).

Another burial practice at Shanshipampa involved the use of small caves. Two burial caves were identified. Each contained multiple individuals who had apparently been interred in large funerary urns. Because of the dry conditions that prevailed, human skeletal remains in a good state of preservation were recovered. Pyrolyzed materials from one cave indicates an age of 600 B.P. \pm 80 years (Beta 136131). Finally, it appears that residents of

the site also buried individuals in funerary urns outside of these caves, possibly in association with houses. The urns are plain, and apparently of expedient manufacture. Charred human remains inside one urn were dated to 940 B.P. \pm 110 (Beta 136130). It is possible that this form of interment is unique in the northern Ecuadorian Highlands. The Shanshipampa mortuary data, taken as a whole, may reflect the presence of the several ethnic groups known, from historical sources, to have been present at the site.

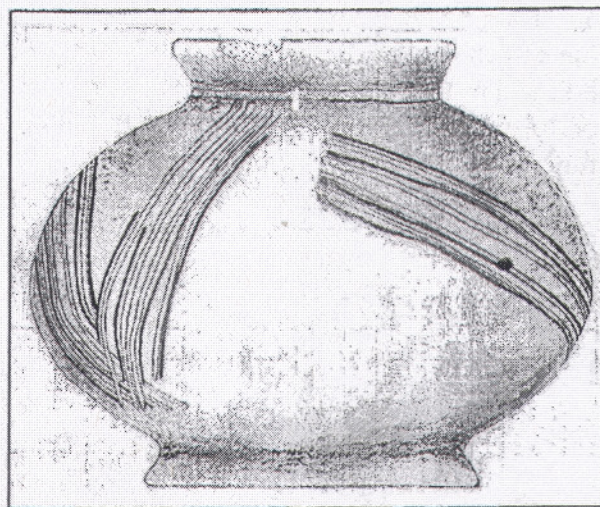
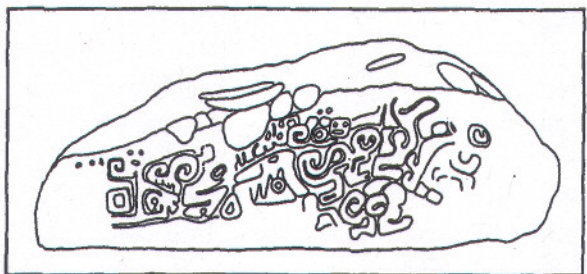
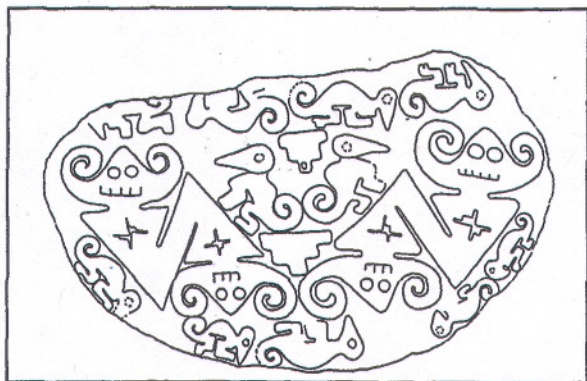


Figure 3. Complete Panzaleo style pot found at the base of a burial pit in a small mound (Feature 6). Panzaleo pottery is a trade ware that was imported from the eastern tropical lowlands by people of the highlands.

A series of petroglyphs was also documented around the site of Shanshipampa, as offering possible evidence of trans-sierran connections. Site boundaries are, in fact, defined in relation to the petroglyphs. Two carved stone monuments, both of which carry imagery suggestive of tropical lowland fauna (monkeys and snakes), were recorded during a visit to the area in 1996 (Figures 4 and 5). These are similar to the imagery found on Tuza style (late prehispanic) ceramics. In 1997, an additional four petroglyphs with spiral, circular, and linear motifs were recorded and a measured plan of them was made. Two of the motifs depicted, a bicephalous snake-like creature, and a monkey-like

quadruped with a curly tail, are identical to those observed on the flagstone pavement at the nearby site of La Mesa, salvaged by Padre Pedro Porras in the early 1970s. Similar motifs have also been observed on rock art from the Nariño district of southern Colombia and the Quijos region of eastern Ecuador. Preliminary analysis of the iconography suggests that the residents of Shanshipampa participated in a widespread visual system that potentially indicates a shared interregional ideographic system, interaction sphere, or pan-regional information network. The distribution of the petroglyphs, in an area known from historical documents to have been occupied simultaneously by several ethnic groups, suggests that they may have performed an ethnic boundary maintenance function as well.



Figures 4 and 5. Imagery from petroglyph at the Shanshipampa site.

The Shanshipampa project also has a archaeobotanical component. The Pimampiro district was a renowned center of coca (*Erythroxylon* sp.) production during the late

prehistoric period. During the 1991 archaeological survey, seven sites containing stone-faced terraces were recorded. Crops known to have been produced on terraces in the Andes include corn, coca, tubers, and local grains, while in the montaña zone, agricultural terraces were widely associated with the cultivation of coca. Coca was a key resource in the precolumbian world, and Bray has posited elsewhere that control over its production may have been central to the development of social hierarchy in this region. In 1993 initial analysis of soil samples from two sets of terraces by the Smithsonian's Tropical Research Institute indicated an abundance of potentially diagnostic phytoliths. In 1997, under the aegis of the Pimampiro Project, César Veintimilla of the Escuela Politécnica Superior of Guayaquil began experimental work to assess the feasibility of identifying coca through phytolith analysis. Preliminary results are promising insofar as several potentially diagnostic phytoliths have been identified in two modern plant specimens of *Erythroxylon*, though initial counts of these phytoliths are low.

Hacienda La Florida, Ayalan Cemetery, Anlulla Shell Midden Mound, and Ferdon's Surface Collections

Earl H. Lubensky (University of Missouri-Columbia, email Lubenskye@missouri.edu) reports on work at several coastal Ecuadorian sites:

Hacienda La Florida

The Hacienda La Florida is at Km 16 on the road from Santo Domingo de los Colorados to Quininde and Esmeraldas, at the extreme westernmost part of Pichincha Province on the Ecuadorian coastal plain. Its approximately 2,000 hectares contain at least 10 archaeological sites, mostly single mounds, but there are two multiple mound sites. In 1979 Earl H. Lubensky and Allison Paulsen excavated Estero Cecilia, the most prominent and complex one. Lubensky also excavated the second multiple mound site, Santa Marta, which is approximately 1500

m to the southwest of the Estero Cecilia site. These excavations were first reported in the Research Reports section of *American Antiquity* (Lynch 1981:201).

The Estero Cecilia site contained at least 19 mounds. Four were quite small, five were intermediate in size, but 10 were up to 100 m in diameter and 8 m high. Except for two deviations, the mounds were arranged in two almost parallel rows high above, and alongside, the banks of the estuary (Estero Cecilia). Excavations were made in three mounds during a two-week period. Hacienda family members had excavated another previously. Figurines and figurine fragments found at the Estero Cecilia site, as well as ceramic sherds recovered there, are generally diagnostic of the Jama-Coaque Phases I and II of the Regional Development Period (500 B.C. to A.D. 500) (cf. Meggers 1966: figure 3, 96-102) and the Integration Period (A.D. 500 to 1532) (Zeidler and Pearsall 1994:6, figure 1.2; Zeidler and Sutliff 1994:112-113, table 7.1). According to Paulsen, the ceramic assemblage at Estero Cecilia contained "apparently regional variants of coastal Guangala style, dated between A.D. 300 and 600, in addition to the less well defined Bahía and Jama-Coaque styles from Manabí and Esmeraldas" (Lynch 1981:201).

Three radiocarbon dates from charcoal taken from two of the mounds at Estero Cecilia are 950 ± 60 BP (Beta-43345) calibrated to AD 1023-1207; 770 ± 90 BP (Beta-43346) calibrated to AD 1216-1377; and 620 ± 50 BP (Beta-43347) calibrated to AD 1301-1408 (Stuiver *et al.* 1998:1041-1083). These dates correspond more to the Integration Period or Zeidler's Jama-Coaque II than to the earlier Regional Development Period, but older dates should come out of lower strata in the mounds, so that both Jama-Coaque I as well as II would presumably be represented, that is the Regional Development Period as well as the Integration Period.

The Santa Marta complex contained at least 13 mounds, one large central mound about 30 m in diameter and 5 m high, with the other 12 surrounding it in an elliptical pattern, different from the plan of the Estero Cecilia site. A 2x2 m excavation, 260 cm deep, was cut in the center of the principal mound. Sherds indicated a likely Chorrera Phase association. The date from one test excavation at Santa Marta was 2950 ± 80 BP (Beta-43348) calibrated to 1260-1001 BC (Stuiver *et al.* 1998:1041-1083). Thus, it is in conformity with the Chorrera Phase.

Six obsidian samples, all from stratum 110-140 cm at Santa Marta, were submitted for X-Ray Florescence (XRF) and neutron-activation analysis (NAA) at the Lawrence Berkeley Laboratory. Results show that five samples were from the Mullumica source (four tested by XRF and one by NAA). One sample tested by XRF was from the Quiscatola-Yanaurco source. Both sources are in the Eastern Cordillera of the Ecuadorian Andes about thirty to forty km east of Quito (Burger *et al.* 1994:232, figure 1; Salazar 1980:25-34, 47-52, Map 1; Villalba 1988:551).

In 1999, cutting edge/mass ratio was determined for the remaining 29 obsidian blades from both sites at La Florida, using a procedure developed by Sheets and Muto (1972:633; see also Fowler 1981:323-324). This ratio was determined to be 3.42cm/g, compared to 1.75 cm/g at El Inga and 10.54 cm/g at the Ayalan Cemetery (see below), confirming a positive and direct cost/ distance relation to the source sites (*i.e.*, El Inga is approximately 25 km from the source, La Florida is about 150 km, and the Ayalan Cemetery is some 500 km distant).

Several possible clay source samples were collected from the Hacienda La Florida in 1993. Along with a number of vessel and figurine sherds, these clay samples were submitted to the University of Missouri-Columbia Research Reactor Center. Hector Neff (e-mail NeffH@missouri.edu) and Michael Glascock's (e-mail

glascock@reactorlmurr.missouri.edu) conclusion was that it seemed "most likely that the bulk of the pottery is locally derived, but from differently weathered sources and via paste preparation practices which modified the clay's composition. In contrast," they continued, "the figurines and some of the pottery from Estero Cecilia are so compositionally distinct from the 'local' pottery that they probably are imported from somewhere else" (personal communication, Hector Neff, January 27, 1994).

Lubensky and Paulsen speculated that the complex may have represented "the remains of a major exchange center dating as early as 800 B.C. with some features that imply the ceremonial overtones and functions that characterize such centers" (Lynch 1981:201). Lubensky suggests that there may be a chronological relationship between the beginning of obsidian use during the Chorrera Period on the coast and the introduction of ceramics in the sierra. Both occurred around 1600 to 1500 B.C. (Lubensky 1999a, 1999b). As examples, Zeidler *et al.* (1994:143-144) state that long distance exchange (of obsidian) with the northern highlands east of Quito is clearly demonstrated as early as 1600 B.C. Villalba (1988:241) recorded the earliest pottery at Cotocollao to date from 1545 ± 200 B.C.

Ayala Cemetery

Current research of the Ayala Cemetery project is designed to augment Douglas Ubelaker's 1981 report (see also Lubensky 1974). The site is on the west bank of the Estero Salada, about 55 km southwest of Guayaquil in the Anlulla sector of the Hacienda Ayala. Lubensky began excavations at the site in 1972. Ubelaker joined the project in 1973 and, in addition to extending the excavation grid, analyzed the human skeletal remains, the urns used as repositories for secondary burials, and the burial goods. There is, however, considerable midden material (ceramic, metal, animal bone, shell, and lithic artifacts) that still must be reported for complete cover-

age of the site. It appears that the burials were either placed in an already existing midden, or midden material was deposited during or between burial episodes.

Judging from radiocarbon dates and most of the ceramic styles, the cemetery is principally a Late Integration Period site. One date from a sample estimated by Lubensky to be from a Chorrera context is 1300 ± 95 BP or A.D. 650 (SI-1372), long after the Chorrera Phase. Ubelaker (1981:13-14) discussed ten other samples submitted to the Smithsonian Institution Radiocarbon Laboratory. Two samples (SI-3305 and SI 3306) gave modern dates and are presumed to be contaminated. Three dates from extended burials (SI-3307, SI-3308, and SI-3309) gave dates of 500 B.C., A.D. 1155 (from charcoal), and A.D. 1110 (from associated soil).

Five dates were produced from bone collagen from urn burials. These include A.D. 730 (SI-3529), A.D. 1730 (SI-3530), and a modern, probably contaminated, date (SI-3531). Two collagen dates from primary extended burials are A.D. 800 (SI-3532) and A.D. 985 (SI-3534). SI-3308 (charcoal), SI-3309 (soil), and SI-3534 (collagen) are from the same grave. Apart from two outliers (500 B.C. and 1730 A.D.), the dates are between A.D. 650 and A.D. 1155, a range of about 500 years. All dates from the Ayala Cemetery are uncalibrated.

Lubensky has developed a typology based on ceramics from the upper levels of the site. These and other artifacts are on loan to the Smithsonian Institution from the Universidad Católica de Guayaquil, recipient of the entire Ayala collection. Lower levels of the Ayala Cemetery site produced deposits apparently from the Chorrera Period, making the Ayala Cemetery a likely Chorrera type site. Other artifacts from the site, especially a bone flute, indicate a Guangala occupation as well. The pottery, however, is largely from the Integration Period (A.D. 500-1532), specifically from the two phases, Milagro-Quevedo, found mostly to the north and east of the Ayala Cemetery, and

Manteño-Huancavilca found to the west of the cemetery. As Emilio Estrada concluded (Estrada 1959; Lubensky 1982), the Ayalan cemetery possibly lay on a border between groups represented by the two contemporary ceramic phases.

Neutron activation analysis conducted on five obsidian samples from the Ayalan Cemetery at the University of Missouri-Columbia Research Reactor by Michael Glascock shows the source site to be the Yanaurco-Quiscatola flow (see Burger *et al.* 1994; figure 1 for location).

Anllulla Shell Mound

Excavation of the Anllulla Shell Mound on the Hacienda Ayalan was an ancillary project to the Ayalan Cemetery excavations. The goal was to determine whether the shell mound was associated with a settlement site related to the cemetery. Radiocarbon dates and ceramics found among the shells indicate that, on the contrary, the mound was formed about 2,000 years earlier. While the cemetery dates principally to the Integration Period (AD 500 to 1500 or the Spanish contact) (Meggers 1966: figure 3), the shell mound containing ceramics (with the exception of the top 70 cm) dates to the earlier Formative Period Valdivia-Machalilla Phases (3000 to 1500-100 B.C.) (Meggers 1966: figure 3).

The mound stood more than 4 m high. Since excavation it has been cut down for the road around the new shrimp pond in the adjacent salitre. The mound was located approximately 2 km to the north of the cemetery. Lubensky excavated a 2 by 2 m cut in the center of the mound, to a depth of 4 m. The bottom strata (370 to 400 cm) were aceramic.

In the next 90 cm (280 to 370 cm) a number of plain and unclassified sherds were found. These were not positively identified to phase, but are presumably Valdivia. In the next 140 cm (140 to 280 cm deep) decorated sherds fit

diagnostically into Valdivia Period D in the typology of Meggers *et al.* 1965 or Valdivia VI-VII in Hill's typology (Hill 1972-74). They were Punta Arenas Incised, Valdivia Appliqué Fillet, Broadline Incised or Carved, Nicked Broadline Incised, Pebble Polished, and Zone Incised styles (Meggers *et al.* 1965), along with unclassified decorated and numerous plain sherds.

In the next 70 cm (70-140 cm), two types of diagnostic Machalilla sherds, Double-Line Incised and Incised and Punctate, appeared along with a number of Polished Red sherds and just three Red Banded sherds, which were assumed also to be Machalilla. Along with these, in the same 70-140 cm level, diagnostic Valdivia sherds, specifically Punta Arenas Incised, Valdivia Appliqué Fillet, Broadline Incised, and Brushed types, continued to appear, suggesting a Valdivia-Machalilla overlap.

Above 70 cm from the top there were no more diagnostic Machalilla or Valdivia decorated sherds, only numerous Polished Red and Red Banded. Lubensky now assumes, after apparently confirming radiocarbon dates showed a dramatic chronological hiatus at about the 70 cm level (see below), that the continuing relatively large number of Polished Red and Red Banded sherds above that level, along with many plain sherds, were possibly Guangala or Jambelí of the Regional Development Period. The mix of Valdivia and Machalilla along with apparently the same Polished Red and Red Banded types at the assumed much older 70-140 cm level is as yet unexplained. Problems of shell mound stratigraphy and perturbation are fully recognized but not clearly solved. Strata at various levels of shell deposit observed during excavation and from later photos appeared level.

Significant ash levels, presumably volcanic, were recorded precisely at 70 cm depth and at about 140 cm, indicating depths and times of almost dramatic ceramic and cultural change. Furthermore, radiocarbon assays taken from levels from 100 cm to 310 cm showed dates in

stratigraphic order; from 100-110 cm, 3210±50 (BETA-108164) calibrated at 1517-1410 BC (an AMS test); from 170-180 cm, 3560±95 BP (N-2908) calibrated at 2012-1741 BC; from 300-310 cm, 4020±220 BP (P-2761) calibrated at 2878-2154 BC. Only the date from 320-330 cm, 3530±100 (N-2909) calibrated at 1947-1690 B.C. (Stuiver *et al.* 1998:1041-1083), is out of chronological order.

A single date of 1380±70 BP at 20-30 cm depth (N-2907), calibrated at A.D. 641-761 (Stuiver *et al.* 1998:1041-1083) was initially rejected as being too recent compared to other dates from the site. However, two more dates from tests performed by BETA Analytic were taken from charcoal samples from 50-60 cm and 70-80 cm that were found among the Anlulla shell mound human bone samples. These also gave rather recent dates. They are 1220±70 B.P. (BETA-21814) calibrated to A.D. 721-956 and 1560±90 B.P. (BETA-21815) calibrated to A.D. 422-637.

These dates fall into a Regional Development transition to the Integration Period, possibly with a hiatus at around 80 cm depth. The transition represented by these dates above 80 cm possibly reflects Guangala or Jambelí Phase occupations in the Regional Development Period, possibly leading into Milagro-Quevedo and Huancavilca/ Manteño phases in the Integration Period.

Two thermoluminescence dates measured on ceramic samples at the University of Missouri Thermoluminescence Laboratory (conducted by Ralph Rowlett (E-mail RowlettR@missouri.edu) also measured within the Formative Period range (at 140-150cm, 3600 BP or 1630±300 BC [MATL 81-1-4]; and at 240-250 cm, 4177 BP or 2200±400 BC MATL 81-1-5]). Two other thermoluminescence dates were out of range. However, four shell samples dated by thermoluminescence at the same laboratory ranged between 600 BC and 3,700 BC (three *Anadara tuberculosa* at 600±250 BC, 1700 ±290 BC, and 3700±860 BC,

averaging 2030 ±210 BC, and one *Ostrea* sp. at 1400±210 BC). These dates may reflect possible Valdivia-Machalilla transition periods.

A number of genera and species of shell were found in the mound, the predominant probably being *Ostrea* (*Striostrea*) *irridescens* (Keen 1971: 84 and personal communication, March 26, 1981; Hernández C., Sección de Malacología, Museo de Historia Natural de El Salvador, personal communication, 1978). Other cultural artifacts included animal bone, a human mandible found in the remnant of the mound during a later visit, plant remains, and crude unworked lithic remains, mainly hammerstones. No obsidian was found in the mound.

A permanent home in Ecuador for the collection from this site was sought for several years while it passed from the Comisión de Patrimonio Artístico del Litoral to the US Consulate General in Guayaquil, to private homes, finally to be turned over to the Archaeology Department of the Escuela Superior Politécnica del Litoral (ESPOL). ESPOL's director, Jorge Marcos, was then head of the Comisión de Patrimonio Artístico del Litoral. Sometime during these transitions two whole Valdivia vessels were lost. ESPOL then moved to the suburbs of Guayaquil, presumably with the collections. Subsequent attempts to retrieve the collection for further study brought the realization that the collections were lost, perhaps some day to be found again.

Ferdon's surface collections

Research continues at the University of Missouri-Columbia Anthropology Research Laboratory on the surface collections made by Edwin A. Ferdon, Jr. in Ecuador before and during World War II, under the auspices of the School of American Research, the Archaeological Institute of America, and the University of Southern California. Ferdon's goals included making an archaeological survey of a portion of the northern Inca realm and excavation of a selected site (Anonymous 1945:127). Ferdon's

work was interrupted by the war in September 1943, when he began to serve with the U. S. Cinchona [quinine] Mission. Ferdon surveyed 118 sites of which he made many detailed maps. He collected artifacts from the surface of, or from cuts at, 62 of these sites. He also excavated the La Carolina site at La Libertad on the Santa Elena Peninsula. This excavation is the basis of Simmons' doctoral dissertation (Simmons 1970). Lubensky wrote his doctoral dissertation on the 35 sites Ferdon surveyed in Esmeraldas Province, on ceramics from 16 of those sites where collections were made, and drew on Ferdon's analysis of "gold mining" activities at the site of La Tolita (Lubensky 1991). Lubensky presented a computerized system for analysis and recording of ceramic attributes of vessel shape, size, manufacture, and decoration. From this he developed ceramic classes and suggested a ceramic seriation for prehistoric Esmeraldas Province.

Students under Lubensky's guidance have completed attribute analysis of ceramics from three sites in Manabí Province and two in Guayas Province. Steven Velasquez prepared a draft consolidated report on the 14 sites surveyed in Manabí Province and Jessica Coats produced a paper on the site of Jaramijo in Manabí Province. Two other Missouri students, Pamela J. Hale and Julia Anne Wagner, completed analysis of the ceramic sherds from a second site at La Libertad where Ferdon made a surface collection (Hale and Wagner 1995). Gene Keay did an initial analysis on the collection from the Punta Carnera site in Guayas Province. Jessica Aberle is devising an attribute classification of the Ferdon surface collection from the Punta Carnera site on the Santa Elena peninsula. Aberle and Lubensky anticipate using her data to develop classes of ceramics involving intersection of a number of select attributes

Collections from 24 additional sites from Guayas Province await analysis, as do smaller collections from Imbabura, El Oro, Pichincha, Los Ríos, Tungurahua, and Chimborazo Prov-

inces. Interrelationships among the sites and the collections, and possibly additional seriations, will be possible with the computer program (PARADOX) utilized for the analyses. The Ferdon surface collections are on loan to the Anthropology Museum of the University of Missouri-Columbia from the Museum of New Mexico in Santa Fe, to which the School of American Research transferred the collections. The excavated collection from La Carolina is now is also at the Museum of New Mexico in Santa Fe. In addition, the Museum of New Mexico has the collections Ferdon purchased on behalf of the School of the Americas and the collections of whole vessels presented to him by the owner of the Hacienda La Tolita on the occasion of his visit to the hacienda.

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The following unpublished papers may be obtained directly from the author upon request.

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1999a Obsidian Exchange in Ecuador. Paper presented at the 27th Midwest Conference on Andean and Amazonian Archaeology and Ethnohistory, Central Michigan University, Mount Pleasant, Michigan.
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Pichincha Province

Ronald D. Lippi (University of Wisconsin - at Marathon County, e-mail rlippi@uwc.edu) directs a long-term regional survey of the western flank of the Andes in Ecuador's northern Pichincha province (immediately west of Quito). The preliminary stage of this project concluded in 1999 with the publication of a lengthy monograph on all the work conducted since 1984. The book, *Una Exploración*

Arqueológica del Pichincha Occidental, Ecuador, was co-published by the Museo Jacinto Jijón y Caamaño of the Pontificia Universidad Católica del Ecuador, the Consejo Provincial de Pichincha, and the Banco Interamericano de Desarrollo, and is on sale through the author or at the above museum in Quito.

Lippi has joined forces with an Ecuadorian-based environmental foundation, Fundación Maquipucuna, and will narrow the focus of much of the future archaeological work in the 6,000 square kilometer Western Pichincha region to the area within and immediately surrounding the cloud forest reserve that was established several years ago by Maquipucuna.

Some of the most interesting archaeological sites in the entire region are located within this area and include two fortresses with an apparent Inca occupation, several pyramidal and conical mound complexes, physical vestiges of ancient trails, the abandoned ancient "salt town" (Cachillacta), the Tulipe pool complex, and many habitation sites spanning the Formative, Middle, and Late Prehispanic Periods as well as the Early Spanish Period (ca. 1500 BC - AD 1660). While the Maquipucuna Foundation is primarily focused on cloud forest preservation and study as well as carefully developed ecotourism, it is working closely with Lippi to develop plans to protect and study various archaeological complexes and to foment "archaeo-tourism" by way of vehicular and pedestrian site tours, a field school, and a possible regional archaeology museum.

In the summer of 1999, Lippi was in the region creating topographic maps of three pyramidal mound sites and of one of the two Inca forts (Pukará de Palmitopamba) as a prelude to future research. He and Fundación Maquipucuna have negotiated the purchase of the land containing the bulk of the Pukará de Palmitopamba to ensure its preservation and to facilitate excavations at the site in the coming years.

They are also working on the very complex problem of assuring the preservation of the Tulipe pool complex. The partial restoration and limited research on the site by Museo del Banco Central personnel in the 1980s was not followed up by the construction of a site museum nor by the protection of the site, because the Banco Central abandoned most of its cultural programs in subsequent years. This unique site, first identified by Frank Salomon (University of Wisconsin at Madison) and later studied by Holguer Jara (Banco Central del Ecuador), has been deteriorating in recent years. Reaching agreement with the various property owners on the site has been complicated and somewhat frustrating, but a concerted effort is underway to preserve the site.

PERU

Batán Grande, Lambayeque Valley

In collaboration with Izumi Shimada (Southern Illinois University, Carbondale, e-mail ishimada@siu.edu), Julie Farnum (University of Missouri-Columbia) has been studying the Sicán skeletal material excavated from Batán Grande, in the Lambayeque Valley. She was in the field during part of 1997, 1998, and 1999. Her analysis of Sicán burials, of both the elite and commoners, forms a major part of her doctoral dissertation, a comparative study of health and diet of prehispanic populations from coastal Peru.

Zaña-Niepos Project

Jack Rossen (Ithaca College, e-mail JROSSEN@ithaca.edu) conducted excavation in July and August 1997 at Cerro Guitarra, a preceramic village in the lower Zaña Valley on Peru's north coast. The first two weeks consisted of theodolite mapping of the site and its topographic surroundings. The locations of 83 houses were documented on three site levels: hill base, slopes, and summit. Also mapped were a stone-lined public plaza in front of the hill, the dry riverbed adjacent to the site, and

various paths and stairways that connected different house clusters. The final three weeks were used to excavate eleven semi-subterranean houses and test excavate the public plaza area. A large quantity of lithic remains, fauna, plant materials, and special samples were recovered. Artifact and sample analyses are underway.

The research was successful in gaining an understanding of a previously poorly-understood phenomenon: the hillside preceramic villages of northern Peru, with their expected dates of about 3000-4000 B.C. Site layout is now understood as a series of interconnected house clusters, and the structure of individual houses as primarily two-room, semi-subterranean, elliptical, thatched roof structures including lithic raw material storage areas and hearth niches. Preliminary analysis indicates the site contains a variety of cultivated plant remains. The research will ultimately document social structures and village formations that accompanied early plant cultivation in the region. The public plaza may also represent early public ceremony and formation of group identities.

Beach Ridges, Santa Valley

In June, 1997, Dan Sandweiss (University of Maine, e-mail dan.sandweiss@maine.maine.edu), geologist Daniel F. Belknap (University of Maine, e-mail belknap@maine.edu) and Stacy H. Shafer Rogers (e-mail SROGERS@EpsilonAssociates.com) and Jeffrey N. Rogers (e-mail jrogers@geosyntec.com) (both then graduate students at the University of Maine) spent several weeks studying the beach ridge sets in northern Peru that emanate from the mouths of the Chira, Piura, and Santa Rivers. The visit was intended to assess the hypothesis of El Niño involvement in ridge formation (Sandweiss *et al.* 1998) and provide ground-truthing for Shafer's remote sensing-based study of ridge formation processes for her master's thesis in Quaternary Studies (Shafer 1999). In general, the field observations sup-

ported the El Niño hypothesis. One discovery concerned the anthropogenic influence on recent ridge-building at Chira. In addition to the field studies, Belknap consulted with officials from the oil industry and local utilities in Talara concerning possible geomorphic effects of the then-predicted 1997-98 El Niño. Funding came from the Peruvian Archaeology Research Fund at the University of Maine and the University of Maine Institute for Quaternary Studies.

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Villa Salvador and Huaca Pucllana, Lima

Kate Pechenkina (University of Missouri-Columbia, e-mail pechenkina@yahoo.com) has discovered two different groups in the human remains from the early Early Intermediate site of Villa Salvador near Pachacamac (Lurín Valley, central coast of Peru). These two groups differ in deformation, physical size, and stress markers. These contrast with similar groups she studied from Huaca Pucllana in the Miraflores neighborhood of Lima.

Manchay Bajo, Lurín Valley

During the summer of 1999, Richard Burger (e-mail richard.burger@yale.edu) and Lucy Salazar Burger (both of the Peabody Museum of Natural History, Yale University) directed the second season of excavations at Manchay Bajo, a U-shaped center on the north bank of the Lurín River across from Cardal. The investigations focused on the central staircase and atrium, the monumental wall, and the domestic

area to the northwest of the monumental architecture. The work on the main mound documented a series of superimposed atria, one of which was decorated with polychrome friezes. It also revealed a sequence of eight superimposed stairways. The research on the monumental wall confirmed that the 750-meter long construction dates to the Initial Period. Work there also provided information on its masonry construction and renovation. The massive wall appears to have functioned as a dam against debris flows triggered by El Niño events. Work in the northwest section of the site confirmed the presence of dwellings made of perishable materials, attested to by post-holes, hearths, and refuse. It also provided evidence of what appears to be an area of ceramic production. Finally, work in this area and testing in the plaza allowed a sedimentary study of the flood deposits that have buried the Initial Period site.

La Paloma, Chilca Valley

Bob Benfer (University of Missouri, email benferr@missouri.edu) has completed the virtual reality component of the Paloma World Project, which is an intelligent digital library that one day will include all the research materials from the Paloma Project. Benfer's web site at present has only a small content component, but it can be visited at <http://gonk.atc.missouri.edu/paloma>.

Antibál, Chilca Valley

Data analysis is underway after test excavations in July 1999 at the site of Antibál, at the head of the Chilca Valley. Antibál is a multi-component site with an Early Initial Period occupation and *chullpas* from later periods. The excavation team consisted of **Bob Benfer**, **Neil Duncan** (e-mail c720256@showme.missouri.edu), **Kate Pechenkina** (all of University of Missouri-Columbia) and **Bernardino Ojeda** from Lima, Peru.



Figure 6. Antibál site (3600 masl), upper Chilca Valley, Peru.

Well-preserved human remains were found with ceramics that are consistent with one early date from the southern extent of the site. Excavators expect that analysis of cores by Duncan of modern and ancient corrals, as well as from areas outside corrals will shed light on Deborah Pearsall's (anthdp@showme.missouri.edu) hypothesis, which is supported by Lawrence Kuznar's ethnoarchaeological work, of a co-evolutionary relationship between herding and the cultivation of certain plant species.

A map of the part of the site where later components are present has been published by an earlier researcher (Engel 1984:77). A map which Ojeda and Benfer completed in 1999 extends coverage from the southwestern extent of Engel's map.

A study, almost ready for publication, that summarizes work on diet and health in prehistoric Peru was done in Benfer's lab done over the past three summers. It includes work by Izumi Shimada has been prepared by Farnum, Pechenkina, and Benfer. Modeling of non-specific indicators of stress (NSIS) exhibited in Peruvian skeletal series that span 6,000 years of prehistory permits Benfer's team to examine diachronic change in adjustments to the challenges of changing resource availability and population density that affected childhood diet and health. Benfer *et al.* find that differences in non-specific indicators of stress varied signifi-

cantly among sites, even when differing age or sex distributions were taken into account. Comparisons of NSIS and demographic variables indicated that prehistoric diet and health of Peruvian children generally followed the trends expected with increasing population density, agricultural reliance, and social stratification. However, elites enjoyed considerably better childhood diet and health than did people from previous, less stratified cultures.

A few unexpected trends emerged. Although high rates of anemic lesions were found at all of the sites, coprolite analyses failed to document the presence of parasites. These data suggest that anemia was not related to this type of infection. Because dietary studies indicate an adult diet rich in protein and iron from marine resources for most of these groups, it seems likely that the high rates of anemia in children were at least partially related to cultural practices such as prolonged breast-feeding, possibly exacerbated by dependence on iron-poor cultigens such as squash and maize.

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Asia Site

University of Missouri-Columbia graduate students **Kate Pechenkina** and **Julie Farnum** have collected data from Cotton Preceramic Period Asia site skeletons. They will use these data to assess a hypothesis under investigation by **Joe Vradenburg** and **Bob Benfer** (University of Missouri-Columbia) that there was a new treponemal disease introduced to the central, western flanks of the Andes from the Amazonian region in the late Initial Period (second millennium B.C.) that brought about the end of certain cultural phenomena associated with this period and permitted the wide-

spread growth of the Chavín cult. **Krzysztof Makowski Hanula** (Pontificia Universidad Católica del Perú, e-mail makows@pucp.edu.pe) and **Mercedes Delgado Agurto** (Museo Nacional de Arqueología, Antropología e Historia del Perú, e-mail mdelgado@pucp.edu.pe) also participated in this research.

Nazca Drainage

Donald A. Proulx (University of Massachusetts, e-mail proulx@anth.umass.edu), assisted by graduate student **Ana Nieves** (University of Texas, e-mail nievesana@yahoo.com) and **Henry Falcón Amado** and **Miriam Gavilán Roayza** (Universidad Nacional San Luis Gonzaga de Ica), undertook an archaeological survey of the lower Nazca River, from Usaca to the confluence with the Río Grande, and then down the Río Grande, past Coyungo to the Maijo Grande oasis. This work was supported by a grant from the H. John Heinz III Charitable Trust.

The 1998 research had four major objectives. The first was to record systematically all of the sites in the survey area in an attempt to complete the coverage of all the major portions of the Nazca drainage. Second, we hoped to find evidence of Nasca habitation sites, which could lead to a better interpretation of the socio-political organization of Nasca society. These data could later be compared to other parts of the drainage to develop a better understanding of the settlement patterns and resource areas.

Third, in collaboration with **David Johnson** (e-mail johnsond@idsinet), Proulx's team wanted to examine possible correlation of sites with water sources (natural springs or *puquios* [*pukyus*], the latter also called "filtration galleries"), and these in turn with the "Nazca Lines" or geoglyphs. In 1996 Johnson announced a strong correlation between certain ground drawings (geoglyphs) and subterranean aquifers that conducted water along geological faults. He argued that the ancient people in this drainage were mapping the location of water sources

with the geoglyphs and that these in turn would lead to archaeological sites.

Finally, Proulx and his team wanted to investigate the major routes connecting the interior agricultural areas with the coast. Success would demonstrate the role of maritime resources in the Nasca diet. Proulx hoped to find archaeological evidence to support the concept of a mixed economy based on both intensive irrigation agriculture and products from the ocean and river.

Proulx's team purchased a set of Peruvian National Aerial Photography Service (SAN) photographs at a scale of 1:10,000. These were attached to a board and covered with a transparent mylar overlay on which sites were recorded as they were found. They also used a complete set of topographic maps at scales of 1:50,000 and 1:100,000 along with a Global Positioning System (GPS) instrument that provided the exact latitude and longitude of each site recorded. This information was transferred to the topographic maps. In addition, NASA 1:100,000 scale satellite maps provided wonderful detail on the geology and hydrology of the region.

Site Tally - Lower Nazca Valley Survey

Period	Culture	Dates	Number of Sites*
Early Horizon	Paracas/ Tajo	900-200 B.C.	13 cemetery 6 habitation
Early Intermediate Period	Nasca	200 B.C.- A.D. 650	77 cemetery 31 habitation
Middle Horizon	N-9, Atarco, Soisongo Epigonal	650-900 A.D.	18 cemetery 1 habitation
Late Intermediate Period	Carrizal, Poroma	900-1476 A.D.	58 cemetery 31 habitation
Late Horizon	Inca	1476-1532 A.D.	5 cemetery 1 habitation

* The numbers exceed 128 because many sites were multi-occupational

Survey began in the lower Nazca River, with the team working their way down the

valley to the confluence with the Río Grande and then returning to cover the basin as far as the Quebrada Usaca. A total of 13 sites was recorded in the Usaca area and another 51 in the Nazca River proper. Later project members moved to the Río Grande, gradually working down-valley through Mal Paso, Batanes, Coyungo, and Las Brujas on the way to Maijo Grande. Sixty-four sites were found on this Río Grande segment, making a total of 128 sites recorded on the survey. Proulx and his team later discovered that a short segment of the Río Grande, from Changillo at the juncture of the Ingenio River and the Río Grande, down to Vincente near the mouth of the Nazca River had never been completely surveyed. Although students from the San Luis Gonzaga University had indicated that they had completely surveyed this sector, they had recorded only a few selected sites. Thus a little additional work needs to be done to make the survey of the drainage complete.

Surface collections of artifacts were made at each site, especially diagnostic ceramics for accurately dating other remains. These artifacts were cleaned, numbered, and photographed prior to storage in cloth bags. Nine cartons of artifacts were deposited at the Museo Regional de Ica at the end of the season.

Analysis of the survey data continues, and results must be compared and correlated to the data from surveys conducted in other parts of the drainage. Below is an account of some of the preliminary findings and questions raised by the research. The 128 sites recorded ranged in date from the Early Horizon (900-200 B.C.) to the Late Horizon (1476-1532 A.D.).

Sites were numbered sequentially as they were recorded in each of the river valleys. RN refers to sites in the Nazca River Valley while RG designates sites in the Río Grande. Early Horizon sherds in small quantities were found in a total of 13 sites, mostly in the lower Río Grande area. The majority of these vessels was utilitarian with decoration consisting of incised

triangles with punctuation, circles and dots, or braided handles. Whether these ceramics should be called Paracas or Tajo is more a matter of semantics than of major cultural differences. A beautiful Ocucaje 8 or 9 interior decorated bowl, found in the Atarco Valley by an agricultural worker, was covered with killer whales with incised outlines and resin paints. Others like it have been found at various sites in the valley. Proulx's survey did not reveal any major Early Horizon ceremonial sites, only several small multi-occupational habitation areas and cemeteries where Early Horizon sherds were part of the assemblage.

Of the 128 sites recorded, a majority (89) had some level of Nasca occupation. Most of these sites were cemeteries (77), but several unexpected features were noted. Previously, Nasca graves were described as unlined pits in the sand in which a seated mummy bundle and funerary offerings were placed, then covered with a roof of huarango beams and/or adobes. Proulx's team discovered a wide variety of Nasca grave forms, including many with adobe walls, and some with thatch roofing material. Judging from recent discoveries of very deep elite Nasca tombs made at La Muña in the Palpa Valley, it appears that there was more variation in Nasca graves than once thought. Unlooted elite graves will be sought for excavation to elucidate the nature of Nasca political organization. Contrary to the expectation of finding cemeteries separate and isolated from habitation sites, many of the cemeteries were adjacent to, and an integral part of, Nasca settlements.

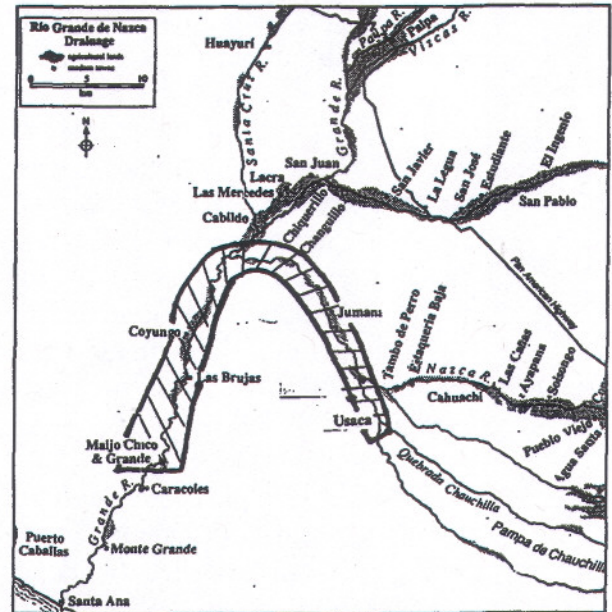


Figure 7. Map of the lower Nazca Valley. Thick black lines and hachures indicate the survey area.

Proulx had hoped to find several large Nasca urban centers in the course of the survey. Surprisingly, most of the 31 sites containing evidence of Nasca habitation could be described as hamlets. The only exception was the multi-occupational complex of sites numbered RG-25, -56, -57, and -58 opposite the town of Coyungo that appears to be one huge urban center with associated cemeteries. Judging from the nature of the architecture and the prevalence of Late Intermediate Period pottery over the site, in addition to occasional groupings of Nasca pottery, the majority of these structures are late (LIP). However, there appears to have been a substantial Nasca occupation here as well. Many of the smaller Nasca habitation sites were located near springs where water seeped from geological faults, providing a year-round source of water. These sites were particularly prevalent in the lower Nazca Valley in the area around Santa Clara, Agua Dulce, and Los Colorados, but there are also a number of springs in the Coyungo basin. Survey results should be compared with the work done by colleagues in the other tributaries of the Nazca drainage in order to ascertain whether there is an anomaly in Proulx's survey area, perhaps with the larger

urban centers being situated in the more agriculturally productive portions of the drainage, or whether small settlements are the rule in Nasca society.

Another surprise was the paucity of Middle Horizon sites in the survey area. Perhaps continued analysis of the surface pottery collections and a better refinement of the ceramic collections will increase this number in the future, but sites with diagnostic "Epigonal" designs are very sparse. Eighteen Middle Horizon cemeteries were recorded, most displaying the characteristic cotton mummy wrappings that are frequently found from this time. Several elaborate Middle Horizon tombs with white painted, plastered walls with niches were found at RN-33. The Middle Horizon sites seem to be concentrated in a small area on the west side of the lower Nazca River just down river from the confluence of the Quebrada Usaca with the Nasca River. Only one site seemed to have Middle Horizon habitation remains. More numerous Middle Horizon sites have been found in other parts of the drainage, including the north side of the Río Grande Valley near Cabildo.

The Late Intermediate Period produced the second largest concentration of sites (after Early Intermediate Nasca sites) and the only ruins that could truly be called urban centers. David Robinson divided the Late Intermediate Period ceramics into two groups, Carrizal and Poroma (Robinson 1957). In the Ica Valley, Menzel built on her earlier designations of Chulpaca and Soniche, which were roughly comparable in time to Carrizal and Poroma, to construct a 10-phase sequence that she called the Ica style (Menzel 1976). Others, pointing to the similarity between these Late Intermediate Period ceramics and those of the Chincha Valley to the North, refer to the style as Chincha-Ica. Until the exact political relationship between these various valleys is better known, and until Proulx can study and seriate the Late Intermediate Period pottery from his survey area, ceramic variations are simply

lumped into the category "Late Intermediate Period."

There are 31 Late Intermediate Period habitation sites in the survey area, including several covering more than one square kilometer. RN-15, RN-17, RG-9, and the complex RG-25, -56, -57, and -58 fall in this category. The huge settlements of RN-15, -17, and RG-9 were constructed on the slopes of hills, near springs overlooking the valley below. The Coyungo complex (RG-25, -56, -57, and -58) was built on the pampa adjacent to the river. The distinguishing feature of these late cities is the use of cobblestones as construction material. Structures of varying size along with huge open plazas are present. Obviously this was a time of population growth and the concentration of people into large centers.

In addition to the habitation sites, 58 Late Intermediate Period cemeteries were recorded, sometimes mixed with the graves of earlier cultures. Tombs tend to be large, deep, and rectangular in shape, often with adobe linings. These tombs often have the best preserved and most numerous organic remains such as mummies, slings, and other textiles. Perhaps due to the increase in population, the sizes of Late Intermediate Period cemeteries are larger than those of earlier periods.

Proulx's team only recorded nine sites with Inca pottery. The most interesting is RG-7, at the area at the base of Cerro Colorado near the confluence of the Nazca River with the Río Grande. There a peasant revealed a fine Inca aryballoid jar found nearby. Proulx suspects that many more of the sites surveyed are Late Horizon or include Late Horizon components, but that local people continued to make their characteristic LIP pottery even under Inca subjugation, as was the case in the Ica Valley (Menzel 1976). The Inca controlled the Nazca drainage from the site of Paredones on the outskirts of the modern city of Nazca. Here one can see Cuzco style stone walls and niches and find more Inca elite pottery. The extent of Inca

control was over this region, and how many sites were built by the Inca must be established from the results of various unpublished surveys which have been conducted in the Nazca drainage.

The second objective of the survey, to shed light on the nature of the socio-political organization of the Nasca Culture during the Early Intermediate Period, will require additional analysis of data from the other surveys undertaken in the drainage to provide valid answers to long-debated questions. However, the lack of large Nasca urban centers in the lower Nazca River and Río Grande sectors, as noted above, supports the now widely accepted theory that Nasca society was organized into a series of local chiefdoms rather than a primitive state controlled by a central government. Sharing a common religion and symbolic system, these local political entities ruled from regional centers in critical locations in the various tributaries. The only possible center of such activity in Proulx's survey area would have been the large complex at Coyungo in the lower Río Grande Valley (sites RG-25, -56, -57, -58). Other centers existed in the more agriculturally dominant parts of the drainage, along the Palpa, Ingenio, middle Río Grande, Tierras Blancas, Aja, and Taruga Valleys. The local leaders ruling from these centers had dual functions as religious leaders (shamans) and secular warriors. The role of warrior-chief seems to have become more important beginning in Phase 5 when well-documented droughts (dating between A.D. 540-560 and 570-610) caused much social upheaval and changes in settlement patterns (Schreiber and Lancho 1995:251). Warfare took place among the many political units to obtain scarce agricultural land and water resources, as well to provide a source of victims for ritual decapitation, especially in Phases 5, 6, and 7.

Proulx's survey documented concentrations of Nasca 5 sites in the Usaca area where several geological faults conducted subterranean water to the area. Settlement pattern analysis is still

ongoing. Nevertheless, differences in the distribution of sites from various cultures and phases are already evident.

The third objective of the survey was to investigate the correlation of the sites discovered with water sources, geological faults, and geoglyphs in conjunction with David Johnson. This research was also successful. Concentrating primarily on the Nasca period sites, the location of non-riverine water sources was carefully noted by the archaeologists. Once the survey was completed, Johnson and his team of geologists plotted the location of the geological faults adjacent to each site and the presence and location of any geoglyphs. A strong correlation was found between site location, faults, springs, *puquios*, and other non-riverine water sources, and large geometric geoglyphs. Analysis is also ongoing, but some of the data have been presented (Johnson 1999).

Finally, Proulx hoped to explore the role of the sea in Nasca society through an examination of the sites discovered in the lower portion of the Río Grande. Some researchers, such as Patrick Carmichael and Brenda Kennedy, have questioned the importance of maritime resources in the diet of the Nasca society, correctly pointing out the distance of most Nasca sites from the ocean and the primacy of agricultural plants in their everyday lives. The ceramic iconography clearly depicts a variety of fish, sea mammals, birds, and fishermen, yet some scholars have argued that these representations were symbolic rather than representational. Our research uncovered large amounts of sea shells, fish nets, sea urchins, and other maritime remains at Nasca sites all along the lower Río Grande and up into the other tributaries as well. Obviously the inhabitants of these small sites had access to the sea and were utilizing maritime resources on a regular basis. Observation of modern fisherman making regular trips to the shore, especially to the vicinity of Puerto Caballas, and a study of the routes taken to these locations have provided valuable new insights into the activities of the ancients.

In summary, Proulx's major research objectives were realized. Although some of the sites in Proulx's survey area had been previously visited by other archaeologists, Proulx and his team studied and documented over 128 sites for the first time, obtaining valuable new information on settlement patterns and laying the foundation for an extensive study of the correlation between the archaeological sites, water sources, and geoglyphs. Future work will concentrate on examining specific sites in the survey area and on testing the validity of Johnson's hydrological theory.

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California Institute of Peruvian Studies on the South Coast

The earthquake of November 12, 1996, in southern Peru devastated the facility of the California Institute for Peruvian Studies (CIPS) at Bella Unión, Arequipa. Fortunately, the collections were salvageable but needed to be moved. This was accomplished in March of 1997 through the efforts of CIPS President **Francis A. Riddell** (e-mail: fariddell@netzero.net) assisted by archaeologists **Richard Brooks**, **Anna Noah**, **Alina Aparicio**, and forensic anthropologist **Sheilagh Brooks**. **Sandra Asmussen** and **J. Arthur Freed** were supporting crewmembers. Some 200 cartons of specimens were transported to the CIPS laboratory and storage facility at the Catholic University

in Arequipa (Universidad Católica Santa María Madre y Maestra). CIPS and the University operate under an agreement by which both the fieldwork and the laboratory/storage facility are joint endeavors.

The California Institute for Peruvian Studies had several groups in the field in 1998. One headed by CIPS president Francis A. Riddell returned to the Chala region on the south coast in August to continue archaeological site surveys. The team consisted of Riddell, **Marie Cottrell**, **Richard Brooks**, **Lidio Valdez**, and **Alina Aparicio**, **Sheilagh Brooks**, and crew members **Sandra Asmussen**, **J. Arthur Freed**, and students **William Fowlks** and **Zasha Trivisonno**. Utilizing Valdez's report (1990), a resurvey was undertaken of the Quebrada de Chala and its branch, Quebrada Huanuhuanu. In the survey new sites were discovered and recorded. Additionally, surveys were conducted southeast of Chala, down coast, in Quebrada Huaccyaco and in the Chaparra Valley as reported by Valdez (1998) and by Aparicio (1998).

Although the visits were brief, ten sites were recorded in the Huaccyaco drainage. Of these, nine were aceramic and may be preceramic in age. No excavation was attempted, but the surface occurrence of *manos* and a *metate* (grinding stones) at several of the sites, as well as an abundance of basaltic debitage, indicates that the pattern of cultural content as well as geographic location deviate from the late sites that have extensive architecture, abundant midden, and a heavy presence of potsherds. Rock rings at several sites suggest house remains, but this cannot be confirmed without excavation. Further investigation is planned for August 2000.

In the Chaparra Valley the team recorded 15 archaeological sites. All appear to be of the Late Horizon, although some may be of the Colonial Period, as well. Here, too, continued investigation by CIPS field teams are scheduled for 2000.

In February and March of 1999 members of the California Institute for Peruvian Studies returned to the south-central coast to continue site surveys and collections studies. The team was headed by CIPS President Francis A. Riddell and was composed of archaeologists Richard Brooks, Alina Aparicio, forensic anthropologist Sheilagh Brooks, museum specialist Frances Durocher, and crew members John Schaller, J. Arthur Freed, and Nathan Parker. Members of the community of Atiquipa were interviewed for site locations and information on the sites in that locality. The sites of Aiparipa, Jihuay, Quebrada de la Vaca, and Taimara were visited and photographs made of architectural features. The local people revealed the location of a "bell rock" near Atiquipa that produces a ringing sound when struck. Local interest suggests that this feature served as a "shrine" in ancient times.

The CIPS field team also made an archaeological site survey of a portion of the Santa Lucía River (also known as Quebrada Jahuay) which flows into the ocean at Lomas (Schaller 1999). Several sites produced sherds of utility ware, and in some instances sherds of Nasca 3 pottery were noted. Due to a high water condition at the time of the survey it was not possible to accomplish a more thorough review of the area.

Two members of the survey team, Schaller and Durocher, made a one-day survey of a segment of the Quebrada de Acaville, a major tributary of the Yauca River. Four sites were recorded, of which one produced Late Acari pottery sherds. The limited review suggests the four sites were Late Intermediate and/or Late Horizon.

Another team of CIPS/UCSM investigators, Dwight Wallace, Julio Manrique, and Alina Aparicio, undertook excavations at Cerrillos, Ica in May and June of 1999 (Wallace *et al.* 1999). Wallace had previously excavated here in 1958. The present project was proposed because the original excavation

had only tested an area 6 meters square. No data on early Paracas style pottery, at least in such volume, had been obtained in the 40 years since the first excavation. Textile analyses were undertaken by Wallace, Grace Katterman, and Oscar Bendezú; the collections are housed in the Museo Regional de Ica (MRI).

With a view of beginning field research in the coming years Catherine Julien (Western Michigan University, e-mail catherine.julien@wmich.edu), under the auspices of CIPS, made a review of archaeological sites in the Atiquipa region (Julien 1999). She had not been in the area since 1972 and wanted to familiarize herself with the recorded and unrecorded sites. She was accompanied by archaeologist Alina Aparicio and student Margaret Enrile. Their first visit was to Quebrada de la Vaca where they made a series of observations and took photos of the present condition of the architecture. Of special interest was the condition of the *qochayuyo* (seaweed) growing on the rocks below the tidal surge. It was abundant, thus suggesting that one of the marine products harvested, processed and stored by the Inca at Quebrada de la Vaca was *qochayuyo*.

The three-person team visited the ruins at Cerro Coco and took photos and notes of vaulted structures, some of which were burial chambers. One had an interior measurement of 1.5 by 2 m and was located inside a walled patio which, in turn, measured about 4.5 by 4 m. The roof of the vaulted structure was closed with slabs that span a meter at the most. There was a course of stones above the slabs of the roof and earth above that.

On a clear day the ocean can be seen from the heights of Cerro Coco. Evidence of ancient agriculture was manifested by eroded terraces upon which non-diagnostic pottery fragments were noted.

At Aiparipa more vaulted structures were noted, in one instance some twenty such structures were seen, and project members noted five

in another group. A dense concentration of structures was made of a relatively fine pink-white granitic material that is more abundant and of a better quality than seen at Cerro Coco. The structures are rectangular and have rounded interior corners. Some have subterranean cists. A number of mortars and *batanes* (grinding stones) were observed in conjunction with these ruins.

Julien and the two other team members also visited the ruins of Pueblo Viejo with local guide and informant, **Juan Segura**. The preservation of these ruins is remarkable. The architecture is quite similar to that of Quebrada de la Vaca and the other neighboring ruins in this region. At Pueblo Viejo, the compounds seem to enclose an open space with a single entrance near one end, with vaulted structures at the opposite end. There are subterranean cists within these compounds, or open areas. Some of the enclosures (compounds) have square pillar-footings like those to be found at Quebrada de la Vaca. These pillars appear to have supported roofed areas along the enclosure walls.

Upon their arrival at the site, the team found small vaults that were recently opened, exposing multiple burials. Abundant textile fragments and cordage were found on the surface, some of cotton and some of wool. At the time of their visit local people were there to collect *qochayuyo*. Juan Segura stated that people spread the *qochayuyo* on the ground inside the enclosures to dry.

The team's visit to the nearby ruins of Ocopa demonstrated that more detailed work is needed here to fully record the somewhat dispersed architectural features. More vaulted structures were seen, some with adjoining circular enclosures with walls more than 1 m high. Evidence of agriculture was in the form of terraces with associated diversion canals, dams and small reservoirs. Rock shelters were noted, one of which had a stone wall at least 1.5 m high across its opening.

Julien and her team made a brief visit to the Chala Valley. This included a stop at Chala la Vieja. In the limited amount of time available it was not possible to record the extensive architectural features to be seen in this part of the valley.

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Chivay, Colca Valley

Dan Sandweiss (University of Maine, e-mail dan_sandweiss@maine.maine.edu), geologist Hal Borns (e-mail borns@maine.edu) (both University of Maine), and archaeologist Bernardino Ojeda spent several weeks in June 1998 in and around Chivay, on the Colca River in Arequipa Department, with support from the University of Maine Vice-Provost for Research and Graduate Studies and the University of Maine Institute for Quaternary Studies. Their goal was to assess the hypothesis that the Chivay obsidian source was ice-covered during the Younger Dryas period (ca. 11,000-10,000 ¹⁴C years ago).

This source was identified by both **Richard Burger** and **Sarah Osgood Brooks** from a location at about 5000 masl, upslope from the town of Chivay (Burger *et al.* 1998b: 204, note 4; Brooks *et al.* 1997). Excavation of Younger Dryas age deposits at Quebrada Jaguay, on the coast, had found only Alca source (ca. 2850 masl; see Burger *et al.* 1998a) obsidian even though the Chivay source is a similar distance from Quebrada Jaguay. Had the Chivay source been ice-covered during the early occupation at Quebrada Jaguay, it would be unnecessary to seek more complex explanations for its absence at that site. Field observations in the Colca Valley indicated that during the last glaciation, ice reached the town of Chivay, some 1400 below the obsidian outcrop. However, surface exposure age dating currently in process is necessary to determine the timing of ice advances. The team did note that pieces of Chivay source obsidian previously observed in the sediments underlying the town of Chivay were brought there as glacial till rather than by fluvial action.

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Quebrada Jaguay

In 1996, **Dan Sandweiss** (University of Maine, email dan_sandweiss@umit.maine.edu) carried out excavations and survey at Quebrada Jaguay, near Camaná on the south coast of Peru. Project members included co-director **Rolando Paredes**, archaeologists **Bernardino Ojeda** and **María del Carmen Sandweiss**, students **Heather McInnis** (then

University of Maine, e-mail hmcinnis@darkwing.uoregon.edu), and **Trevor Ott** (University of Calgary, email tohott@calgary.ca), and field technician **Oswaldo Chozo**. Financial support was provided by TIMEX Corporation, the H. John Heinz III Charitable Trust, and the Curtiss T. and Mary G. Brennan Foundation. Excavations were centered at Quebrada Jaguay 280, an Early Pre-ceramic site discovered in 1970 by Frédéric Engel (1981:45). A suite of radiocarbon dates on charcoal from the site now confirms that there was a Terminal Pleistocene occupation dating between about 11,000 and 10,000 BP (uncalibrated) and an Early Holocene occupation dating between 9500 and 7500 BP (uncalibrated). Fish and shellfish provided nearly all of the animal protein during both occupations, indicating great antiquity for maritime adaptations in the region (Sandweiss *et al.* 1998). Full cover survey of the surrounding region (5 km to the northwest, 5 km northeast, and 10 km to the southeast) identified more than 60 sites, mostly pre-ceramic. Comparison of surface remains and dates on basal material from shovel tests show that the sites represent two pre-ceramic periods, one between ca. 9500 and 7500 BP and one centered around 4000 BP. A few ceramic-bearing sites were also found.

During June and July of 1999, **Dan Sandweiss** resumed excavations at the Early Pre-ceramic fishing site of Quebrada Jaguay. Financial support for the season came from **Thor Heyerdahl**. The field crew included archaeologist **Miguel Cabrera**, undergraduate students **Arturo Santos** (San Marcos University) and **Ted McClure** (Indiana-Purdue at Fort Wayne, e-mail Eichrodt@aol.com), graduate students **Ben Tanner** (University of Maine, e-mail ter.303@compuserve.com) and **Fred Andrus** (University of Georgia, e-mail cftal@peachnet.compuserve.com), and field technician **Oswaldo Chozo**. The field lab was run by archaeologist **Julissa Ugarte**.

Field work in the 1996 season showed that Sector II was Terminal Pleistocene in age and included possible post-holes. The recent excava-

tions confirmed the presence of multiple post-holes and other features dating to several moments during the Terminal Pleistocene.

Archaeologists **Dave Sanger** (University of Maine, e-mail sanger@maine.edu) and **Bernardino Ojeda** spent several days on site as part of their related project inspecting early lithic collections in Peru and northern Chile. Ongoing analyses include work on the lithics by Dave Sanger and Ben Tanner; phytolith, starch grain, and pollen analysis by **Dolores Piperno** (Smithsonian Tropical Research Institute, e-mail pipernod@stri.org); caliche analysis by Fred Andrus; faunal analyses by **Heather McInnis** (University of Oregon, e-mail hmcinnis@darkwing.uoregon.edu) (McInnis 1999), **Elizabeth Reitz** (University of Georgia, e-mail ereitz@arches.uga.edu), and Fred Andrus; and radiocarbon dating of bulk samples by **Howard Melville** (Jaan Terasmae Radiocarbon Laboratory, Brock University, e-mail hmelville@spartan.ac.brocku.ca). **Bruce Smith** (Smithsonian Institution, e-mail smith.bruce@si.edu) has recently completed study of three Early Holocene gourd fragments uncovered during the 1996 season.

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Dental Research

Rick Sutter (e-mail C569310@showme.missouri.edu), a 1997 Ph.D. from the Univer-

sity of Missouri-Columbia, is beginning a program of research using dental traits to establish the major outlines of the peopling of South America. He will use Peruvian central coastal materials as well as dental materials from as wide a geographical spread as possible.

BOLIVIA

Taraco Project

During May through August 1996, 1998, and 1999 the Taraco Archaeological Project, co-directed by **Christine Hastorf** (University of California, Berkeley, e-mail hastorf@SSCL.berkeley.edu) and **Matt Bandy** (University of California, Berkeley), conducted research at Chiripa, a site on the southwest shores of Lake Titicaca in Bolivia. The core team members are **Lee Steadman** (e-mail steadman@aol.com), **Kate Moore** (University of Pennsylvania), **William Whitehead**, a graduate student at UC-Berkeley (email whitehea@SSCL.berkeley.edu), and **José Luis Paz**, an archaeologist from the University of San Andrés in La Paz. Additional help in the field came from **Melissa Goodman** (Cambridge University, e-mail mag1008@cus.cam.ac.uk), **Ian Hodder** (Stanford University, e-mail ihodder@stanford.edu), **Donald Johnson** of the Institute of Minnesota Archaeology Consulting, and six students. Further specialist help has come from **John Southon** of the Lawrence Livermore Laboratory Dating Lab. **Susan D. de France** (Florida Museum of Natural History, e-mail sdef@anthro.ufl.edu) is studying small animal bones. **David W. Steadman** (Florida Museum of Natural History, e-mail dsteadman@flmnh.ufl.edu) is analyzing bird remains. **Kate Moore** (University of Pennsylvania, email kmmoore@sas.upenn.edu) has responsibility for large animal bones while **Deborah Blom** (University of Vanderbilt, email deborah.e.blom@vanderbilt.edu) will work on human bones.

1996 was the second field season of this project (the first was in 1992), although **Wendell Bennett** in the 1930s, **Alfred Kidder** and

Gregorio Cordero Miranda in the 1950s, Maks Portugal Zamora in the 1960s, and David Browman and Max Portugal Ortíz in the 1970s have excavated there previously. From their work at Chiripa, we know about the existence of the site's central mound. This 0.36 ha construction has at least three building levels and probably dates from 1400 B.C. through Tiwanaku times (or to approximately A.D. 1000).

The mound visible on the surface is a Tiwanaku I monolith-lined courtyard that shows continuity with the earlier structures. The Formative site spans 7 ha surrounding the mound, upon three created terraces that slope down to the lake plain. The mound is on the middle terrace. Chiripa is especially interesting to Andeanists because of its proximity to imperial Tiwanaku. Tiwanaku was an important center for almost 800 years beginning around A.D. 300 and therefore Chiripa is considered one of Tiwanaku's primary precursors. Chiripa flourished during the earlier Formative Period of Bolivian prehistory, with a ritual center overlooking Lake Titicaca and the string of snow-peaked mountains to the east. The Formative Period, as it is called in Bolivian archaeology, ranges between 2000 B.C. and A.D. 400 according to Charles Stanish's interpretation of the regional sequence, with Chiripa dating to the Middle and Upper Formative Periods.

The Taraco Project's research goals are several. While trying to understand the Formative Period in the south-central Andes, including detailed artifactual changes, project members are especially interested in the early dynamics of increasing political scale and subsistence changes, particularly agriculture. At Chiripa Formative sites, these activities are clearly intertwined with intensive ritual actions, traces of which are also under investigation.

The site's importance is seen in the results from systematic surface collections that were

completed in 1996. The ceremonial areas, Llusco, the mound, and Santiago, make up less than one hectare. There seems to have been a substantial residential area on all three terraces surrounding this central precinct.

The Project has been trying to uncover evidence of domestic areas and activities, but this is proving difficult. Excavations in 1996 took place in two areas, north and south of the mound. However, both areas, Llusco and Santiago, have yielded large (approximately 11 by 13 m) semi-subterranean stone-walled enclosures. The investigators believe these to be ceremonial (gathering) areas rather than habitation zones. Llusco was first excavated by **Claudia Rivera** in 1992. Excavations by **José Luis Paz** followed in 1996. It is on the uppermost terrace and dates to the Late Formative Period, or what we call Late Chiripa, about 800 to 600 B.C. The Llusco enclosure has patches of white plaster on its floor and a drainage canal in the lower, northwest corner.

To the north, and on the first terrace, Santiago directly overlooks the lake shore. This area was opened first by **Sonia Alconini** and **Sigrid Arnott** in 1992 and substantially expanded in 1996 by **Emily Dean** and **David Kojan**. This part of the site is a complex of use and rebuilding layers dating throughout Formative times. There are surfaces that seem to be fairly clean, and in some cases have yellow or white plaster. Human pit burials cut through this plaster in many places. It seems that ritual burial and feasting occurred in this section at least, but there could also have been some habitation quite close. This area of the site is extremely important, yet still mysterious as to the total types of activities that occurred there. The stratigraphy is complicated and will be illuminated by **Melissa Goodman's** microstratigraphic analysis.

In 1998, work continued in Santiago, again under **Emily Dean** but with **Bill Whitehead** also working to the west. The plan was to further refine understanding of the chronology and

function of the very early semisubterranean enclosure encountered in the Santiago area, called Choquehuanca. This enclosure is 13 by 14 m. Its excavation involved several long trenches. From analysis of these trenches two important facts emerged. First, the enclosure was definitely constructed in the Middle Chiripa Phase (1000-800 BC). The builders cut through several meters of Early Chiripa strata to sterile soil, then leveled the ground with Middle Chiripa fill, laid a clay base, and built a fine yellow floor across the surface. This was used in the Middle Chiripa times, and once abandoned, dense Late Chiripa fill was placed in it. The northern and eastern walls are poorly preserved, while the southern and western walls are deeper and in better condition. Team members exposed 28 square meters of the floor and collected samples there. They are beginning to study the plant, animal, ceramic, and lithic remains, in addition to the micro-depositional history. Full details of the trapezoidal Middle Chiripa enclosure remain undetermined. However, Hastorf's team have learned that set in its east wall there is a small stone niche, about one meter in length. It contained nothing visible. This could be what is seen later on the mound, and at Pukara, Tiwanaku, and even in Inca enclosures - wall niches that held important sacred objects. Part of the inner stone wall was plastered. The Llusco and Choquehuanca enclosures are the earliest in their region discovered to date.

The final goal of the 1996 archaeological project was to understand better the Formative portions of the mound. Matt Bandy undertook several cleaning operations. His main task was on the east side of the mound, which had been cut back by the community in the 1960s to build a football field.

There he uncovered clear evidence of the "Upper and Lower House" Formative levels in his profile. Previous work on the mound suggested that there were between 14 and 16 structures surrounding a sunken plaza. We have now confirmed that there are 14. Some

may have been substantial, but no structures are untouched and complete. Ten structures, however, are probably in good condition. The evidence suggests that these were not inhabited, but were more likely ceremonial structures, keeping special and sacred items and housing sacred activities. The bins do not seem to have held quantities of crops, as did *Inca colca*, and the bins could not have been entered.

Each structure was perhaps used by an *ayllu*, or an extended family associated with a territory. With two groups of seven on each side there is a strong sense of moieties. These structures are made of adobe and stone, with plastered surfaces on the walls and floors. Four superimposed structures were seen in the eastern profile. Each structure has a series of yellow plaster floors. Between each re-flooring there is evidence of ritual sealing, with sterile soil or sand laid down, often accompanied by a fire. Further evidence of such floor treatment also was seen in the cleaning of historical fill along the south face of the mound. Most floors looked clean, although the top "Lower House" floor had lots of fish remains and pottery. One hearth was also encountered.

In 1996 Melissa Goodman of Cambridge University joined the project briefly to collect microstratigraphic samples of all areas. This research should show what types and intensities of activities were undertaken in these mound structures. In collaboration with John Southon and the Lawrence Livermore Laboratories, the Project has run a series of AMS dates for each of these floors, to understand the timing and scope of the re-flooring events in the mound. Unfortunately, the curve at this time in the past will not be able to separate out this time span for us.

Advancing another main goal, to understand better the Formative Period occupation of the site, the Taraco project undertook test excavations in four areas identified in the 1996 systematic surface collection program. These excavations located two more Late Chiripa stone foundation enclosures with the potential

for more subsurface walls as well as a Middle Chiripa mud-brick wall. In the two northern areas, near Choquehuanca there are portions of beautifully made stone canals. One is attached to the corner of what seems to be a large Late Chiripa enclosure, although enough has not yet been uncovered to confirm this hypothesis. At the Alejo area, the river cobble, stone-lined canal runs more than 4 meters down slope, with a cover stone where the water entered the canal. There is a corner of a cut-stone structure with a double-sided canal also running downslope on an angle. To learn about these areas beyond the test pits, a magnetometer and resistivity survey of the central part of the site's surface was undertaken by Don Johnson. This sub-surface survey located some possible walls at Quispe as well as near Choquehuanca. This will help construct a complete catalog of all Formative Period architecture at the site, because all of the site, except the mound, lies under fields and is extremely difficult to excavate. The results suggest that excavations in the Quispe area should be expanded to understand better the enclosure apparently found there. Especially interesting about this foundation at Quispe are the differences of the stone work compared to that of the other enclosures. This evidence allows the hypothesis that various groups made these structures, creating their bounded space in their own styles.

Another goal of the 1998 and 1999 seasons was to learn about the lowest deposits under the mound, which date to the Middle Chiripa Phase. The Montículo 1 area is located along and near the southern section of the exposed eastern face of the mound. A trench measuring 4 m north-south by 6 m east-west was opened there. This was the section of the profile that was cleaned in the 1996 season. Two thin units were excavated in 1996, exposing remains of Lower House Level structures. In the 1999 season, we expanded what was discovered in the 1998 excavation. The area just to the east of the fence used to be part of the mound, but was cut back during the hacienda period, probably sometime in the 1940s.

Thus, by excavating in this area we hoped to obtain a sample of the deposits which originally lay below the mound, thereby avoiding the difficult, destructive, and even possibly dangerous task of excavating through several meters of mound deposit in order to reach them. Below the top fill level we encountered the remains of an adobe wall. This wall runs north-south for the entire length of the trench. We now know it was at least 11 meters long, and we did not find the northern corner of it. This wall, approximately 70 cm in width, exhibits a peculiar construction technique. It is composed of very large "pillow" adobes, 70 cm long by 20-40 cm wide, made of sterile red clay. These red adobes are in turn placed within a dark, organic mud matrix mortar. Interesting about these from the 1999 excavations was the fact that each brick was burned on the top, as if to harden it. Only the lowermost course of the wall was preserved, so it is uncertain whether the entire height of the wall was constructed in this manner. Nevertheless, this technique has not been observed in any other structure excavated at Chiripa to date, and in no other structure in the Titicaca Basin to my knowledge. Once again we are seeing a wide range of building techniques. We now have two different building techniques for the Middle Chiripa Phase and at least three for the Late Chiripa Phase.

An additional cleaning was undertaken along the south side of the mound (upslope) in 1999, reopening up a modern mixed area that we investigated in 1996. We needed to extend our earlier trench to try to determine the number and placement of upper house structures as well as the location of the opening into the inner courtyard. We made a long twelve meter profile there and determined that there was no structure in the middle of this side of the mound at that late Late Chiripa time, meaning there was an opening upslope to that side of the community. Hence we now believe that there were 14 structures in this final phase, making this two sets of seven houses each. The discovery of physical evidence for moieties in the in the Late Chiripa Phase wonderful.

Lee Steadman oversaw the ceramic analysis as well as ran the laboratory every field season. Not only do the ceramics hold the key to the dating and seriation of the site and its relationships to other villages within the region, they are critical for identifying the activities on the site, such as cooking, storage, and ceremonial and burial practices. Given that a detailed ceramic sequence has not been fully formed for this part of the Titicaca Basin, Steadman is completing essential work on the Formative-to-Tiwanaku phases in the southern Titicaca Basin. Three ceramic phases are defined for the Chiripa occupation of the site, based on observable differences between the ceramics in the stratigraphic levels and 14 new absolute dates. The terms used by the Taraco Project have been employed before by Karen Mohr Chávez, who based her work on Kidder's excavations. The Taraco Project phases are adjusted slightly earlier. New absolute dates and ceramic analysis have indicated phases that date to Early Chiripa - 1500- 1000 BC, Middle Chiripa - 1000-800 BC, and Late Chiripa - 800-100 BC (calibrated).

William Whitehead, René Ayon, and Franz Choque have overseen the collection, processing, and sorting of the soil flotation samples from the excavations. The Project followed a blanket collection strategy of 10 liter bulk (point-provenienced) samples. Furthermore, in midden and surface contexts, average soil samples were also collected, to improve the representation of those contexts. In all, 384 soil samples were collected and processed. These are important for the recovery of plant remains but also for fish bones and other small animal remains, and they provide a quantitative sample of all artifacts.

Concurrent with the Taraco Project excavations in 1996, Mario Montano Aragón worked on a toponymic map of the local catchment area in and around the modern community of Chiripa. He discovered hundreds of place names that link to past and present

activities in the area, noting that the Aymara language extends back in time.

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