

The development of Huari administrative architecture

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Transition to statehood in the Andean Highlands during the Middle Horizon involved the development of architecture designed to facilitate bureaucratic administration. Planned¹ buildings believed to have served bureaucratic administrative purposes are present at several sites, notably Azangaro near Huanta (Anders 1981), Jargampata near San Miguel (Isbell 1977), Jincamocco near Cabana Sur (Schreiber 1978), Pikillaqta near Cuzco (McEwan 1979, 1980, 1981; Sanders 1973), and Viracochapampa near Huamachuco (McCown 1945; Thatcher 1975; Topic and Topic 1982), but their long presumed center of origin at Huari near Ayacucho (Isbell and Schreiber 1978; Rowe 1963; Rowe, Collier, and Willey 1950) can only now be demonstrated. Excavations at Huari during 1979 and 1980 by the Huari Urban Prehistory Project, under the direction of William H. Isbell provide evidence of the evolution of state administrative architectural forms.

Huari is an urban site that covered between 1000 and 1500 hectares and possessed an architectural core of 400 hectares (Isbell 1982). The site appears to have risen to prominence during the late Early Intermediate Period and to have begun to establish a number of state administrative centers throughout the highlands during Epoch 1B of the Middle Horizon (see Figure 1, Isbell, this volume). The site appears to have been largely abandoned by Epoch 3.

A number of archaeologists have contributed to our understanding of the site of Huari. Tello (1970) published the first archaeological description of Huari. Rowe, Collier, and Willey (1950) visited the site in 1946 and attempted to relate Huari to other Andean sites, including

Nazca and Tiwanaku, based on ceramic analysis. Bennett (1953) undertook the first systematic excavations at Huari and published a sketch map of the site. Menzel (1964, 1968) conducted detailed analyses of Huari ceramics and established a chronology of the Middle Horizon. She suggested that militaristic expansion by Huari would account for the distribution of Huari ceramics and regional administrative centers. Lumbreras (1960, 1974, 1981) conducted archaeological surveys and excavation in the Ayacucho Valley under the auspices of the National Registry of Peruvian Archaeological Sites, the University of Huamanga, and the Ayacucho Archaeological and Botanical Project, directed by Richard S. MacNeish. Benavides (1979) excavated at the Cheqo Wasi Sector of Huari which contained a number of rectangular structures fashioned from finely prepared cut stone blocks, similar in construction to those encountered at Tiwanaku (Posnansky 1945: 113-117). Isbell (1980, 1982, this volume; Isbell and Schreiber 1978) initiated the Huari Urban Prehistory Project in 1974 by conducting a reconnaissance survey and mapping of the well-defined portions of Huari. In 1977-1978 an intensive survey was initiated to define the site boundary, and excavations were conducted in the Moraduchayuq Sector of the site. In 1979 excavations to determine the transition between Early Intermediate and Middle Horizon Periods were conducted in the Ushpa Joto, south of the Capilla Pata, and Churukana Hill Sectors of Huari. Knobloch (1983) analyzed ceramics of a Huarpa component immediately south of the Capilla Pata Sector which dated to A.D. 295 \pm 110. Pancho Solano excavated remains of human burials in the Monqachayuq Sector of the site, immediately north of the Moraduchayuq Sector. Michael and Christine Brewster-Wray (1979, 1982, this volume) excavated at the Moraduchayuq Sector in an effort to determine if activity

specialization correlated with room shape types established during wall trenching operations in 1977. Isbell and Spickard (1982) conducted excavations in the Moraduchayuq Sector dealing with the upper Middle Horizon 1B component and exposing a semi-subterranean structure of cut stone blocks beneath it.

The particular combination of architectural features and overall plan that characterizes Huari administrative architecture is distinctive, even though several of the features occur in earlier building traditions from other parts of the Andes. A number of scholars have offered lists of features of Huari administrative architecture based on the remains from provincial facilities (Isbell 1977; Rowe, Collier, and Willey 1950; Sanders 1973), and Katharina J. Schreiber (1978) has presented a detailed comparison of the rural administrative centers, emphasizing the planned nature of the installations and describing their construction sequence based on excavations at Jincamocco. By contrast, the goals of this paper are to present the major features of Huari administrative architecture based on a comparison of regional centers, to offer an interpretation of administrative architectural design in light of general architectural theory, and to establish an outline of the development of administrative architecture at the capitol city of Huari.

In discussing the evolution of Middle Horizon state administrative architecture, it is important to note that evolution is predicated on cultural evolution instead of biological analogy. Rather than emphasize the importance of tradition and gradual reforming of previous forms, it is argued that transformation to state administration necessitated a formalized, systematic design that facilitated bureaucracy. The apparent goals were the immediate impression of massiveness, control of traffic

flow within the complex, efficient network integration of specialized task or habitation areas, and structural design for flexibility through time, rapidity of construction, and minimal cost. Historically, it has been demonstrated that under conditions of colonization, planted towns have tended to assume their most stereotyped forms (Scargill 1979:176). The design elements were present in previous Huari architectural forms, but the Huari architects combined them in a new way to facilitate bureaucratic administration both at Huari and in intrusive, colonial installations.

The following architectural features appear to be present at the five sites believed to be administrative centers and at the Moraduchayuc Sector at Huari (Brewster-Wray 1982; Isbell and Spickard 1982). The features are rank ordered in terms of my perception of their significance to the Huari state administrative architectural design. Textual support for the presence of these features at different administrative centers is indicated in Table 1. While limited excavations, differential preservation, local building traditions (McCown 1945:254), relative time of construction, and probable diversity of function (Schreiber 1978:190-191) at various regional administrative centers have contributed to some apparent lack of correspondence of features in Table 1, lack of evidence from some sites is not assumed to negate the majority-indicated patterns. The state administrative design features include:

- 1) Rectangular enclosures² whose planning is evinced in bonding of foundations,³ and underlying canal system;
- 2) Division of the larger enclosures by main avenues,⁴ which may signify some underlying symbolic duality in separating areas of dense, complex construction from relatively open places and permit organic growth;

- 3) The area circumscribed by enclosure walls is designed as an infrastructure of rectangular cells; each cell when built up forms an integrated unit⁵ composed of an open courtyard at ground level, flanked by multistoried corridors⁶ (at least in larger installations) on at least two sides;
- 4) Mortared rubble masonry walls of modal thicknesses and types; while thickness modalities may vary between infrastructures, the proportional decrease in width correlating to perimeter enclosure, integrated unit, and corridor subdivision positions appears to be consistent;
- 5) Streets and avenues that serve to restrict and/or channel access of the populace, and limit access between integrated units;
- 6) Elaborately prepared rooms which apparently served as bureaucratic reception areas and/or elite residences and possessed
 - a) plastered and painted walls
 - b) niches of modal size
 - c) furnishings⁷
 - d) finely prepared plaster floors
 - e) subfloor shallow, plastered depressions or deep, stone-lined and plastered cists.

Frequently in archaeological analysis of architectural design, emphasis has been placed on function rather than form (Earl and March 1979:327). This appears to reflect both anthropological concerns with "adaptation" and concern to avoid ethnocentric bias. While it might be argued that design is culture specific, it is also true that certain features relating to the definition of space and structural properties remain constant across architecture of varying technology.

It is argued here that an examination of Huari administrative archi-

ture in light of architectural principles forms the basis for a new explanation of the origin of the general Huari administrative architectural design. Earlier descriptions have been based on functional explanations, both in terms of domestic residence (Isbell 1977) and state administration (Schreiber 1978). Isbell (personal communication) suggests that a traditional Andean Highland settlement pattern of rectangular structures surrounding an open communal area may have coalesced to form the Huari pattern of courtyard surrounded by corridors. Schreiber (1978: 237) emphasizes the role architecture plays in reflecting activity patterns associated with social and political organization. She develops a typology of Huari architecture based on attribute analysis and site planning.

Huari architects appear to have maximized several spatial and structural principles of general architectural theory in developing the designs of state administrative installations. These principles are integrated into an expanded discussion of the six administrative architectural features listed above.

Beginning with an idea of a structure to be placed at a strategic control point in a valley or along a transportation system (Schreiber 1982), or in a region of possibly newly-integrated peoples of different ethnic groups, it was important to insure that the installation could be erected relatively quickly and appear to be invincible and bureaucratically efficient. Enclosure walls of greater thickness and height than internal walls were constructed first, over foundations that were bonded. A grid plan is the most efficient architectural plan in a bounded structure (Broadbent 1973:241). Therefore the space within the enclosure wall was subsequently subdivided into rectangular integrated units. Some of these were left relatively undeveloped for future modification,

while others were immediately built up. It would seem likely that this rectangular infrastructure was designed to facilitate installation renewal in the face of functional change, but the division may also have emphasized some duality of open and closed spaces since major avenues separate these areas in at least the larger regional administrative centers.

Central, open courtyards surrounded by multi-storied corridors are the dominant feature of the Huari infrastructural plan. Norberg-Schulz (1971:23) emphasizes that from an architectural perspective, the largest areas in which activities will be carried out should be placed at ground level and small, enclosed multiple-storied structures should surround the large open areas. In this way there is a focal area for specialized task and communal activities, and minimization of difficulty in providing for structural support members, wide spans, and restriction of light. Reinforcement for this perspective is present in the integrated unit design wherein the courtyard areas are clearly linked to their surrounding corridors by doorways, whereas links between corridors are infrequent.

Evidence for the fact that corridors were multi-storied is plentiful. Walls were coursed only at the level of change between stories. At this level, support for floor beams of the next story was afforded by rows of corbels,⁸ ledges, or square holes extending through the masonry walls,⁹ or some combination of these three on opposite interior sides of the corridors. Based on evidence at the Moraduchayuq Sector of Huari, beams were laid across the corridors and supported by corbels. Wooden cross-pieces were lashed to the beams and to each other with 2-ply, Z-spun twine, and then heavily coated with clay (Isbell and Spickard 1982). In one area of the Moraduchayuq Sector that was possibly remodeled at the time of the construction of the planned administrative infrastructure,

the lower story was deliberately filled in and upon excavation, the two stories were revealed with filled-in doorways to the north (Brewster-Wray 1979). This circumstance clearly indicates the nature of multi-storied corridor construction.

In other cases, accessibility is more difficult between adjacent corridors and corridor rooms, and especially between adjacent integrated units. As indicated in Table 1, nearly all investigators have commented on apparent restriction of mobility within the installations. Various explanations have been offered, including the likely presence of ladders, or short steps to negotiate corridor crosswalls (Schreiber 1978:47, 67), stairways to second stories, and the possibility that transit across the site was achieved by roof-top pathways (Sanders 1973:58-59). While each of these options may have been actualized in some cases, the likelihood of flat roofs (McCown 1945:253; Sanders 1973:389) seems remote in the highland rainy areas where Inca and present-day roofs are steeply gabled or sloped.

The likelihood that second stories were an important means of access between integrated units suggests itself on the basis of modern architectural principles regarding high density enclaves (Friedman 1975:28). The complexity of Huari administrative architecture may result from examining two-dimensional plans and attempting to design for both restriction of access between some integrated units and connection of other units. In comparing the plans of the Huari administrative installations, it becomes apparent that as the number of courtyards increases, the number of corridors increases. If in the infrastructure one desires to move from one cell to the next in linear sequence, then the route is easy and direct, but if it becomes necessary to interconnect four cells that all have linear sequence connections, but also individual access each to every

other, then it is not possible to remain in the planar frame.

One either has to cross over one of the cells or tunnel beneath it in order to connect cells on its opposite sides. In the case of preserved Huari architecture, this crossover would be most likely to occur via an upper story. Ascension to the second story could be by ladder or stairway. The apparent lack of access between integrated units on ground floor levels may have served to reinforce cooperative interaction within each unit, lack of disruption, and personnel control, as well as privacy in residential areas.

The number of crossover points, or in the case of Huari administrative architecture, the number of corridors, is a function of the number of integrated units to be connected. Each time there are more than seven cells to connect, there will be more crossovers than linked points. A linkage of seven main integrated units would necessitate nine corridors, if each integrated unit were to be directly connected to every other (Friedman 1975:64).

While there are difficulties in relating this model directly to the Huari installations because exposed walls may not reveal doorways, and second story levels may not be preserved, counts were made of integrated units and associated large rooms, and corridors based on a proportional relationship of 7:9. In every case, the number of corridors relative to rooms corresponded remarkably closely to the expected frequencies, deviating by only + or - 1 (Spickard 1982b:12).

It is suggested that the original filling in of the infrastructure left many corridors as open passages. Subsequently, functional necessity or increased controls led to divisions of the corridors into small rooms (modally 2-3 in the 6 administrative centers). This suggestion is supported by the fact that internal walls of corridors were not bonded, but

Table 1. Basic description and textual references of Huari administrative architectural features at Huari and five Huari regional administrative centers.

<u>Sites</u>	<u>Integrated Units</u>	<u>Second Story Supports</u>	<u>Benches</u>	<u>Wall and Floor Preparation</u>	<u>Room Niches and Subfloor Features</u>	<u>Access Across Site</u>	<u>Access Between Rooms</u>
Huari, Moraduchayuc Sector (Brewster-Wray 1982) (Isbell and Spickard 1982)	Open courtyards measure 9 x 10-11 m.; corridors are 7-16 m. long and 2 m. wide (Brewster-Wray 2-3)	corbels occur in corridor rooms at 2-2.3 m. above floors	in 4 of 5 courtyards low benches line perimeter and extend 1 m. into yards and lie 20 cm. above floor (Brewster-Wray 3-4)	white plastered walls over a layer of clay (Brewster-Wray 3) finely prepared floors including fine gravel overlaid by tamped earth with cap of white plaster (Isbell-Spickard)	clay-lined depressions and subfloor cists 1 m. diameter, 1.5 m. depth; (Brewster-Wray 4); 4 stone-lined cists 60 cm. diameter, 45 cm. depth 2nd subfloor depressions (Isbell-Spickard)	access to complex through a single doorway to north; stairs in east-west corridors	doorways to courtyards pass through adjacent corridors
Azangaro (Anders 1981)	north sector contains courts and galleries of varying patterns (6)		largest reception hall had benches lining at least two walls (8)	flagstone floors (15)	tombs (10); caches of luxury items (14)	main entry in south wall and avenue to north with control points (6)	low, narrow doors found in central sector (7)
Jargampata (Isbell 1977)	large plaza with galleries, without internal partitions (41)	corbels, that are not matched on opposite walls and not present in corridor units (37)	long east-west walls of second construction had low benches built against their courtyard faces; these are 40 cm. wide and 40 cm. high (41)	no evidence of white plastered walls; fine gravel inclusions in floors (37)			door in east walls of rooms open onto terrace; possible door to plaza from south gallery (37, 41)
Jincamocco (Schreiber 1978)	rooms (courtyards) bounded on 3 sides by corridors arranged in series and measuring 2.3 m. in width; corridors from 2 types (41, 53, 67)	indications are that structure had only one story; walls were not preserved to a height that would have revealed second story supports (27-28, 30, 32)	benches lined rooms (courtyards; 36-42, 52)	clay plastered walls, possibly covered with white plaster (56, 65) pounded earth floors (65) and white plastered floors with subfloor bedding of small stones (29, 55, 65, 97, 100)	sub-bench, stone-lined depression with burial and stone-lined burial pit (35-41)	some corridors used as walkways (46)	absence of doors for access between walkways and rooms; walkways serve effective boundary between adjacent room blocks (41, 58-59, 67)
Pikillaqta (McEwan 1979, (1980, 1981) (Sanders 1973)	open court with surrounding galleries; one building measured 1,296 m. ² of which 810 m. ² was open court and remainder roofed corridors (393, 395)	ledges, corbels, and wall holes all present; occur 2.5-2.9 m. above floors (388, 390)	upper terraces placed against corridor walls (396)	walls capped with white plaster, white gypsum plaster floor, underlain by dense stucco of pounded earth and gravel (387)	3 large niches in center of wall, about 1.28 m. apart and 86 cm. wide (385)	two wide avenues approach site from north and south; other streets and avenues roof transit (384, 391-393, 405)	stairways only definite ancient doors between corridor and central court; restricted access (388, 393, 396, 406)
Viracochapampa (McCown 1945) (Topic and Topic 1982)	open court with surrounding galleries is fundamental building unit (268-269)	corbels of quartzite cobbles, ledges, and wall holes; frequently the latter were placed just above corbels or ledges; supports placed 2-2.8 or 3 m. above "ground" (270-271; 1982:6-7)			niches that pierce the walls are very rare (271); but these may refer to beam supports	long street run length of site; (267)	entrances rare, in regular system of communicating doorways or passages (271)

Table 1. Basic description and textual references of Huari administrative architectural features at Huari and five Huari regional administrative centers.

<u>Sites</u>	<u>Size and Orientation</u>	<u>Foundations/ Planning</u>	<u>Site Divisions</u>	<u>Canals</u>	<u>Wall Masonry and Form</u>
Huari, Moraduchayuc Sector (Brewster-Wray 1982) (Isbell and Spickard 1982)	1000-1500 ha. 45.5 m. N-S 56.5 m. E-W .5 ha. 60 rooms align with cardinal directions	pattern of wall bonding and abutment indicate that north unit was built as planned unit	possible open area to southeast but site too disturbed to be seen; not a consideration in Moraduchayuc itself	elaborate drain system with worked stones indicating under- lying canal orienta- tions (Brewster-Wray: 4)	mortared rubble masonry that is double-faced with rubble interior
Azangaro (Anders 1981)	447 m. NW-SE 175 m. SW-NE 7.5 ha. (6, 25)	pattern of wall bonding and abutment indicate simultaneous construc- tion (6)	few artifacts in north sector; north- eastern sector only blocked into grid; lack of internal sub- divisions may reflect site abandonment (12-13)	failure in the water supply system may have caused site abandonment (14)	
Jargampata (Isbell 1977)	25-25.5 m. ² 15 x 25 m. addition to north Walls align with cardinal directions	layout and construction indicate single effort; base of foundation lies 10-20 cm. below court- yard (35)			fieldstone laid in clay mortar (17)
Jincamocco (Schreiber 1978)	250-260 m. NE-SW 130 m. SW-NE 4-6 ha. (7, 140)	planned construction se- quence; foundations are bonded and set into trenches 80-140 cm. below floor levels (28-29, 45, 62-64, 142)	large open plaza areas to east and residential areas to west (50, 66, 76-77)	stone-lined canals covered with small, flat slabs (36-38, 41, 45, 64)	rubble filled masonry preserved to single story level (27-28)
Pikillaqta (McEwan 1979, 1980, 1981) (Sanders 1973)	735 m. NW-SE 630 m. SW-NE (1979:16) 700 m. NW-SE 600 m. SW-NE 50 ha. (382)	concept of planning in- volves linkage with other site areas (1979:34-35) planned town (383, 386, 394-395, 401, 408)	large, empty walled areas in southern section (383) various expansions may account for incompletely devel- oped areas (1979: 35-36)	canal system present (McEwan, personal communication)	90 cm. colica wall thick- ness (1981) rubble masonry walls to 8 m. height, battered with 3 width modalities (382, 387-388)
Viracochapampa (McCown 1945) (Topic and Topic 1982)	565 m. N-S 580 m. E-W orientation closely approximates cardinal directions (267)	evidence of planning (252, 267)	western part less built up than eastern part (268)	no canals encountered (271); however, I personally observed one drain to main avenue	random rubble type with blocks packed with snecks; double batter of high walls; wall site modalities (270)

abutted, in contrast to larger walls of the integrated units. The fact that the corridors were often arranged serially around the courtyards, especially at the earlier and smaller centers, may support their construction at different times. This would support the idea of blocking out a rectangular infrastructure, but only building it up as the need arose. While Schreiber (1978:50) reports that corridors were installed simultaneously at Jincamocco, this may reflect the nature of the units excavated or a later stage of integrated unit planning.

Jargampata is the least complex of the regional centers (Isbell 1977). Although this may indicate that the center housed few functions, it also supports the idea that the fewer the units that were to be connected, the fewer the corridors, and the concomitant unlikelihood of second story levels. At Jargampata, corridors are present on north and south sides of the courtyard. No corridor existed to the east, and a corridor was observed to extend only midway on the western side. These corridors were built at the time of an addition to the northern side (Isbell 1977:41). While projecting stones do exist at Jargampata, they are present only in small rooms that are not parts of corridors and are lower in height than the typical pattern of 2.5 m. at the other centers. It is likely that they supported shelves at Jargampata.

Benches were placed at the perimeter of courtyards of integrated units adjacent to walls of corridors. In addition to the fact that doorways connecting corridor rooms to courtyards are numerous, the presence of benches suggests that many activities took place in the courtyards. The benches were likely roofed with porticos. As the remaining portions of the courtyards were unroofed, the benches likely served to protect the interior from rainwater as well as to provide a dry working area. Canals under the courtyard floors probably functioned as drains.

The Moraduchayuq Sector at Huari has yielded evidence of an elaborate canal system¹⁰ that was carefully installed before the construction of the interior walls of the integrated unit (Brewster-Wray 1982:4). In some cases the canals were simple troughs cut into bedrock. In others, they were stone-lined and capped with stones. Schreiber (1978:63) has noted that canal preparation was effected immediately after setting of the foundations at Jincamocco. A canal outlet is apparent at the base of the east wall at the southern end of the main avenue that divides Viracochapampa into two sections. Canals have also been located at Azangaro (Anders 1981:12) and Pikillaqta (McEwan, personal communication). Indeed, Anders (1981:12) postulates that canal system malfunction may have led to site abandonment.

The construction sequence employed by Huari builders attests to the high degree of planning behind the design of administration (Schreiber 1978:63). The foundations were laid in trenches cut into bedrock at Moraduchayuq and Jincamocco and were bonded. Major avenues and streets were established in relation to these. The infrastructure of major division walls of integrated units was then set in, followed by corridor walls and smaller rooms distinct from corridors. These walls were likely to have been bonded to one another if set in at the same time period, or abutted if they were added at a later time period. Thinner walls that divide the corridors into small rooms were always abutted. Schreiber (1978:30-33, 143-146) has extensively discussed wall forms and size modalities for each of these types of walls.

The transformation to bureaucratic administration at Huari was marked by two significant developments that can be inferred from the available archaeological record. First is an architectural design that united

multiple building forms in a grid layout, presumably to facilitate different administrative functions. Second is the integrated unit that served to coordinate increased specialization by encouraging departmental efficiency. The finely fashioned corridor rooms[^] apparently served as reception and office areas, as well as residences of the administrators.

Excavations at the Moraduchayuq Sector of Huari (Brewster-Wray 1982; Isbell and Spickard 1982) provide the bulk of the information on these finely fashioned rooms, but similar features have been encountered at Azangaro (Anders 1981:8) and Pikillaqta (Sanders 1973:385). The following architectural features distinguish these rooms:

- 1) finely prepared and plastered floors
- 2) plastered walls, painted white or red
- 3) wall niches of modal sizes
- 4) subfloor depressions or cists
- 5) built-in furnishings, such as tables and platforms.

In contrast to other corridor rooms with tamped floors, those that are more elaborate have floors that are carefully prepared in a sequence of six steps:

- 1) bedrock may be smoothed
- 2) a canal system prepared
- 3) the ground surface may be leveled with trash fill
- 4) a relatively thick layer of compacted soil is applied
- 5) a cover of dense gritty layer or stucco or fine pebbles is added
- 6) a fine white plaster of gypsum or lime is applied.

Beneath some of these floors are either white-plastered, stone-lined cists (60 cm. diameter, 45 cm. depth), or shallow,

plaster-lined depressions (22 cm. diameter, 8 cm. depth; Spickard 1982a). Activity of looters had severely disturbed the cists in one residence, but evidence suggested that there had been four cists and that there may have been burials in at least two of them. Finely prepared, decorated pottery was in association. Caches of luxury items were encountered in some of the plaster-lined depressions and provide evidence for the presence of elite persons.

In the same corridor room with the four subfloor cists were built-in furnishings. A semicircular raised platform lay over one cist in the northeast corner of the room and a table measuring 60x30x60 cm. lay directly below a niche at the center of the west wall (Isbell and Spickard 1982). In another corridor room in the same complex, another table was encountered with an offering pot mortared into its base.

Niches in the Moraduchayuq administrative complex are of two modal sizes. Smaller niches measure 25x25x30 cm., while larger niches measure 75x45x50+ cm. (Height of larger niches is not determinable as walls are not preserved to their full height; Isbell and Spickard 1982.) A small niche was heavily stained with soot of the type produced by repeated burning of a lamp. In a large niche above a hearth area in another corridor room were lithic flakes, bones, and ceramic fragments that had not been broken in situ but appear to have been stored in the niche.

Having presented the major features of Huari administrative architecture in the context of architectural principles that may account for many of them, I would like to briefly outline corresponding features which may be observed in earlier structures at Huari. While some of these features may also occur elsewhere in the Andes, it is significant that at Huari they form a long tradition.

The earliest structure at Huari dates to about 1000 B.C. on the basis of associated ceramics. The western wall of this Early Horizon building was encountered at the bottom of a 2x2 m. excavation at the summit of Churukana Hill at the eastern margin of Huari (Spickard 1982a). The sherds located at floor level and immediately beneath the floor included some similar to Curayacu on the Central Coast and others with dark red pigment on brown suggesting ties with the South Highlands (Edward P. Lanning, personal communication).

This rectangular structure was oriented on a NE-SW line, which accords favorably with other Early Horizon sites with corners oriented to cardinal directions (Lumbreras 1981:170; Terada 1982). The foundation of the structure rested on bedrock and consisted of a single course of sun-dried clay blocks (Spickard 1982a). These crudely formed blocks appeared to be reutilized portions of a tapia wall.¹¹ Upon these blocks was placed a tapia wall whose height in the excavation profile was apparent to 50 cm. The exterior of the foundation was plastered with clay to a thickness of 10 cm. A collection of large rocks which may have been mortared bordered the structure. The floor was constructed of very hard lime plaster and averaged 7 cm. in thickness. Possibly to insure proper drainage and evaporation, some sun-dried clay blocks were placed on the bedrock beneath the floor. Trash was utilized as fill beneath the floor. Thus, from the Early Horizon structure at Huari, prototypes exist for:

- 1) straight-sided structures that probably formed rectangular buildings
- 2) concern with orientation of structures to the cardinal directions
- 3) foundations that rest on bedrock (although not yet placed in

trenches within bedrock)

- 4) clay plastered external walls
- 5) finely prepared interior walls (in this case, of tapia)
- 6) specialized floor construction, including
 - a) incipient drainage
 - b) subfloor leveling with trash
 - c) floor surface of compacted white plaster

Two structures were excavated in 1977 and 1979 in the area between the Moraduchayuq and Capilla Pata Sectors of Huari. The structures were rectangular, and the earlier structure was clearly part of a complex of rectangular rooms. The buildings were constructed of rubble masonry walls. The structures dated to the transition period between the late Early Intermediate Period and Epoch 1A of the Middle Horizon. The southernmost structure was clearly Huarpa at its earliest levels based on associated ceramics (Knobloch 1983). It was underlain by a stone-lined canal which was excavated into sterile soil. In an adjacent room was a stone-lined and capped cist with a depth of 75 cm. The structure was plastered and presented a series of plaster floors interspersed with layers of trash fill. The northern structure was bordered by a collection of rocks reminiscent of those adjacent to the Early Horizon structure. The interior of the structure was plastered and two subfloor depressions were encountered. One may have been a hearth and the other contained a few pieces of obsidian and chert.

Two circular structures with Huarpa ceramics were encountered just to the north of the Moraduchayuq Sector of Huari. The easternmost structure measured 10 m. in diameter. Its wall was faced and constructed of field stones and mortar with a rubble hearting.¹² This construction is characteristic of Huari administrative architecture, excepting corri-

dor subdivision walls. The wall varies in thickness between 75-80 cm., which is intermediate in size between Huari integrated unit wall and enclosure size modalities (Spickard 1982a). The wall is seated into bedrock in a trench which is characteristic of Huari administrative architectural foundations placed on bedrock (Brewster-Wray 1982; Schreiber 1978). The trench was prepared to a depth of 40 cm. beneath bedrock surface. The wall was set as close to the interior of the trench as possible. The structure appeared to have been plastered with light red plaster.

The circular structure to the west included a number of floor features that appear to be Huari administrative architectural antecedents. Further excavations will be needed to verify the association between the wall of the structure and apparent division walls encountered in an excavation conducted by Brewster-Wray (1979). But the plan may be interpreted as a rectangular area at the center of the circular structure with small compartments lining its perimeter. This may have been a forerunner of the integrated unit. Other features associated with this building were subfloor plaster-lined depressions and a possible bench that was 20 cm. higher than the floor. The bench and floor were coated with a fine white plaster.

The function of these circular structures is unknown, and their interpretation is complicated by considerable disturbance. It is possible that the westernmost structure may have borne some relation to high status elites. A fine interior and sub-floor depression imply that the building was a residence, but it may have been a workshop for production of luxury goods, including chrysocolla (locally known as "turquoise"), Spondylus shell, gold, and other semi-precious stones. Brewster-Wray

(personal communication) recovered 20 kg. of chrysocolla per cubic meter. Few of the luxury materials were finished pieces. The majority of the chrysocolla was of poor quality or possessed cortex (Spickard 1982a:5). Both the volume of luxury material and the fact that most of it appears to be waste from manufacturing support the idea of a production center. However, the finely prepared floor, bench, and subfloor depressions may indicate a residence and/or storage area of high status elites.

Thus by the end of the Early Intermediate Period at Huari the following features of administrative architecture have been shown to be present:

- 1) Groups of closely associated rectangular rooms;
- 2) Possible open center patio area with surrounding small rooms;
- 3) Walls seated into trenches in bedrock and constructed of faced field stone and mortar construction with rubble hearting;
- 4) Walls intermediate in thickness between perimeter enclosure and major interior wall modalities;
- 5) Walls plastered with white and red plaster;
- 6) White plastered floors and benches;
- 7) Subfloor depressions and cists;
- 8) Canals, cut into bedrock and stone-lined;
- 9) Artifactual and architectural evidence of high status elites.

The cut stone monumental structure encountered below the Middle Horizon 1B Moraduchayuq Sector of Huari is unique in the archaeological record of the Central Highlands. It was constructed in A.D. 580 \pm 60 based on a radiocarbon sample collected from the stone and mortar stabilizing fill (Isbell and Spickard 1982). The cut stone structure most closely resembles the semi-subterranean temple at Tiwanaku (Ponce 1969),

but rather than a pattern of cut stone blocks, interspersed with vertical ashlers, the structure was built of tightly fitted rectangular, trapezoidal, or polygonal blocks. The cut stone structure was built in a natural depression which was enlarged and shaped in the bedrock. A fill of roughly-shaped field stones and mortar was placed between the external wall of the temple and the side of the natural depression.

The temple is square, measuring 24.11 m to a side, or 581 m² (Isbell and Spickard 1982). Its west wall was determined to lie 4-5 degrees west of present-day magnetic north. As declinations may alter as much as 10 degrees through time, it is conceivable that the temple was deliberately oriented to the cardinal directions.

The monumental structure saw three major phases of construction. The original floor was of plaster. A second plaster floor was painted red. A carbon sample collected between the two plaster floors yielded a date of A.D. 720 \pm 60. At a later date the upper walls of the temple were finely planed and a floor of finely fitted cut stone blocks was installed. A number of well preserved painted cut stone blocks suggest that the entire structure was painted red. A carefully prepared canal system may have functioned to transport water into the center of the temple.

The cut stone structure provides evidence of the knowledge of structural engineering appropriate to massive structures and hydraulic management. It may also have helped in the development of the grid form for planned buildings. When the temple was leveled for the construction of an administrative complex, a rectangular area was vacated and the remaining wall bases created a square foundation base aligned to cardinal directions. The Epoch 1B construction utilized the north and south walls as foundations, and was built parallel to, but not on top of the east and

west temple walls.

Within the enclosure were placed all of the features defined above as characterizing Huari administrative architecture. Whether this enclosure was the first such administrative complex to be constructed at Huari remains to be demonstrated, but its relation to the underlying large rectangular unit is supportive. A related administrative complex was constructed to the south of this unit at the same time period (Brewster-Wray 1982). The Huari architects had clearly perfected an administrative design which they could use to plan installations for the expansion of the Huari state. The enclosure at the Moraduchayuq Sector was constructed in early Epoch 1B, and shortly thereafter, administrative centers begin to be constructed in various highland regions.

Footnotes

1. "Planning" is distinguished from "order." Order may result from organic growth (Scargill 1979:143), but planning involves design and authority to implement.
2. "Enclosure" is used to refer to the thick perimeter wall that defines the margin of the administrative installation.
3. "Foundation" is defined as "the materials through which the load of a structure is transmitted to the earth, and which usually lie below ground level" (Cowan 1973:110; Harris 1975:216).
4. "Avenue" refers to a relatively broad thoroughfare that serves to divide major sections within an enclosure. "Streets" serve to facilitate transit between the rectangular integrated units (Schreiber 1978:164-165).
5. "Rectangular integrated unit" is chosen to distinguish this form in order to avoid some of the ambiguity present in the terms "room block" and "room complex" (Schreiber 1978:164). "Room" is used to refer to enclosed spaces adjacent to rectangular integrated units, or subdivisions within corridors. The term "compound" has occasionally been used to refer to these units, but it has the connotation in English of an enclosed space used for the temporary confinement of prisoners of war (Webster's).
6. "Corridor" refers to elongated rooms and not necessarily to spaces designed to facilitate transit. In the Andean Middle Horizon literature other terms may be used to distinguish these functions and forms.

Schreiber (1978) employs "corridors" to indicate passages, and "galleries" to indicate elongated spaces that are subdivided into rooms. Isbell (1982) prefers the term "hallway" which can simultaneously indicate a walkway or hall analogous to medieval dining halls. In publications in Spanish, galleria is used and has then been translated directly into English as "gallery." However, in English, gallery has the connotation of "portico" ("a porch or covered walk consisting of a roof supported by columns"; Webster's).

7. "Furnishings" is used to refer to the furniture (movable items) and built-in fixtures of a room.
8. "Corbel" in masonry is a projection used to support beams of second stories, lintels, or overhanging courses, such as balconies (Cowan 1973:61; Harris 1975:129). In the vernacular (Webster's), there may be a connotation of a bracket that is attached to the wall for the support of the upper course. However, this does not typify the form as the stones project from the wall itself. Coursing is only apparent at the level of change in stories (Schreiber 1978:142). Corbels may also have served to reduce destruction by earthquakes. Wright often used cantilever effects in earthquake regions (Broadbent 1973:44).
9. The expression "square holes extending through the masonry walls" is utilized instead of the term "niche" which is frequent in the literature. While Webster's indicates that a niche is "a position particularly suitable for the person or thing in it," and a beam could apply here, the more frequent connotation of a niche is "a recess or hollow in a wall, usually intended for a statue or vase." The term "niche" is reserved here for recessed cubicals in walls of rooms in which items could be placed. The square holes extending through the masonry walls which were used to support beams for the upper stories are distinguished from other holes in the walls by the fact that the masonry is coursed, and corbels, ledges, or similar holes are located opposite them at the same level. Various authors (McEwan 1981; Sanders 1973; Schreiber 1978) have noted that sometimes the corbels are stepped. I would suggest that the holes may have supported balconies or scaffolding. Although some authors (McCown 1945:245) have discounted scaffolding as an explanation, it seems very apparent that construction of 2-3 stories or more would require it. As the walls would have been plastered subsequently, the holes would not ultimately be visible or sufficient in number to structurally weaken the walls. Having recently discussed masonry construction with a British stonemason and viewed holes in an old Norman wall in Southampton that were utilized for overhanging galleries and scaffolding, I am impressed with the diversity of uses of such wall holes.
10. "Canal" refers to troughs prepared for the transport of water. Sometimes canals are distinguished from drains on the basis of whether they transport fresh or waste waters. Here they may do either.
11. "Tapia" refers to adobe-like stiff clay that is formed and rammed in a movable frame (Harris 1975:495, 364).
12. "Hearting" is "masonry forming the interior of the wall, as distinguished from facework" (Harris 1975:246).

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