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DEMOGRAPHIC CHANGE AND ECONOMIC TRANSFORMATION IN THE SOUTH-CENTRAL HIGHLANDS OF PRE-HUARI PERU

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Introduction

When the Huari empire began to exert its influence over foreign territory, Andahuaylas, to its south, was one of the first areas to be drawn into the Huari artistic, political, and presumably economic hegemony. Huari occupations are found superimposed on almost all of the earlier settlements around the Andahuaylas basin. Thus, an understanding of the culture history of Andahuaylas is germane to the problem of the rise of Huari and will, I believe, help to understand not necessarily the causes, but at least the economic foundations upon which Huari power may have rested.

The aim of this study, then, is to examine not the Huari empire itself, but rather the events that preceded it in one area of the southern highlands of Peru, the Chumbao Valley, province of Andahuaylas, department of Apurimac. This valley is located midway between the ancient capitals of Cuzco to the south and Huari to the north and is the first major population center south of the Ayacucho-Huanta drainage, the apparent homeland of the Huari ceramic style and capital of the empire. I shall apply the insights gained from recent ethnographic work in the highlands to help interpret the archaeological record and to suggest that a highly productive vertical economy was operating in the sierra of Andahuaylas at least by the Early Intermediate Period, several hundred years before the rise of Huari. This hypothesis is based on two parallel lines of evidence: first, the consistent location of pre-Huari settlements relative to distinct environmental zones of the Andahuaylas region; second, the appearance in the archaeological record of what can, on the basis of the ethnographic studies, be identified as key integrating factors essential for maximally intensive exploitation of the different environmental and economic zones present in Andahuaylas.

The geographical setting

Andahuaylas is currently the name of the valley of the Chumbao River, which rises in the eastern slopes of the Chumbao mountain range, located to the southwest of the department of Apurimac and ultimately drains into the Pampas River, which separates the departments of Apurimac and Ayacucho (Quintana, 1967, p. 91). The province, as well as the largest of three, valley-bottom, mestizo and predominantly Spanish-speaking towns, are also called Andahuaylas. The name is apparently a Spanish derivation of the Inca designation for the valley: Antihuaylla, Antahuaylla, or Andaguâylas (Cobo, lib. 3, cap. XI; 1956, tomo 91, p. 78). The road leads south some 90 km. from the valley of Chumbao to the next major city, Abancay, and from there 464 km. to the coast of Nasca. The city of Andahuaylas occupies the center of the 11 km. long valley, with the colonial and modern towns of San Geronimo and Talavera situated at either end of the valley on the Cuzco-Ayacucho road. These three towns are the focus of Spanish and Mestizo culture in the province; each dates to at least the sixteenth century. Each is laid out on a grid plan around a central plaza bordered by the Catholic church, government administrative offices, and the residences of the primary land holders of the province.

In addition to annual wet and dry seasons, the temperature and relative humidity of this intermontane basin fluctuate according to both time of day and elevation. The higher the altitude the colder the climate, ranging from generally warm, dry, and sunny days below 3100 m. elevation to cool, moist, and cloudy above 4000 m., with a graduated decline of .56° C./100 m. elevation (Mitchell, 1976, p. 30; Terborgh, 1977, p. 1008). This temperature gradient affects the nature and composition of animal and plant communities over relatively short distances.

The climate and vegetation zones encountered at differing altitudes have been classified variously by Western observers from the Colonial Period to the present. As early as 1653, Bernabé Cobo, borrowing in part from earlier accounts, described the existence of six altitude-specific Andean environmental zones, each characterized by specific climate and vegetation patterns and differing human adaptations (Cobo, lib. 2, caps. VII-XVII; 1956, tomo 91, pp. 65-95; Rowe, 1980, p. 3). In this century, Western scholars have used a variety of terms and categories, generally reflecting gross differences of vegetation patterns, to divide the differing eco-zones of the Andes (Bowman, 1916; Pulgar Vidal, 1946; Tosi, 1960). Few if any of these differing vertical typologies are universally applicable and most have been criticized recently for being too general and lacking the subtlety recognized by the contemporary inhabitants (Fonseca Martel, 1976; Brush, 1977b, pp. 73-79; Vallée, 1972). Both the width and absolute height of each life zone, regardless of its defining characteristics, vary with the topography and latitude of each region. The more broken and steep the gradient of the slopes, the more irregular and mixed the interface between zones. For any one region, the line separating lower, *kichwa*, grain-producing zones from the upper, *jalka*, tuber-producing fields varies with latitude and shifts as much as 500 m. in elevation between northern and southern Peru (Brush, 1977b, p. 82).

For the Apurimac drainage, perhaps the best insights into the different ecological zones have come from bird ecologists, who evaluated the avian food base by identifying and quantifying the relative diversity of animal and plant species in controlled sampling units of increasing altitude (Terborgh, 1977). These quantified comparisons permit the distinction of 5 major vertical environmental strata (in the Apurimac drainage basin somewhat north of the Chumbao Valley), with major shifts at 650 m., at 1385 m., at 2500 m., and finally at 3500 m. and above. The Chumbao Valley, at 2900 m., and its surrounding upper slopes overlap with the last two of these zones (Terborgh, 1977, p. 1008).

From the lowest rain forest to the upper puna, Terbough documented an overall reduction in plant and tree height, a general reduction in the diversity of plant species, a 2:1 drop in the diversity of fruit-bearing plants and a sharper 5.2:1 drop in insect-eating birds. The insect biomass declines by a factor of up to thirtyfold between about 1500 m. and the timberline at 3600 m. Ants and termites do not exist in the Apurimac above 2500 m. (Terborgh, 1977, p. 1008). The decline in insects between 3100 and 3600 m. implies fewer pests and insects for high-altitude plants and animals.

Two aspects of Andahuaylas geography and climate are especially important in establishing an archaeological perspective. The first is the presence of a sharply defined zone of lush vegetation, which rings the valley from its floor at 2900 m. to a height of 3100 m. (figs. 1, 2). This temperate eco-zone is the focus of intensive subsistence agriculture in the region today and probably also in antiquity. The second feature is a line of parallel ridges or hills, which converge on the valley from all sides as spurs of the surrounding mountains (fig. 2). The tops of these ridges, 180-200 m. above the valley floor, are located at the boundary of two major environmental zones and were the favored location of ancient occupation in the area.

On the slopes below the ridges and in the valley bottom, the main crops are grains and other temperate zone staples that thrive in medium to low elevations. The lower basin is today the focus of irrigation agriculture and is defined by residents as the *kichwa* zone. Just above the ridge tops, on the intermediate slopes from approximately 3100 m. to around 3600 m., the fields are unirrigated and reserved for tuber and some grain cultivation. Above 3600 m., the environment shifts to puna or *jalka*, and it is here, above 4000 m., that the people of Andahuaylas today maintain their herds of camelids, as well as certain high-altitude tubers reserved for freeze drying for storage. These three zones are contiguous, and all three occur within 10 km. Comprehension of these patterns is essential for an understanding of the changing economic orientations of the pre-Huari peoples.

The economic background

The economic reconstruction that will follow is based on the primary assumption that pre-Inca ridge-top settlements bore a critical functional relationship to the economic patterns of intermountain valley population centers like Andahuaylas. The role of warfare in the rise of states has often been discussed in Andean studies and many students have seen any hilltop settlement location as "potentially defensible" (Browman, 1974, p. 190). Such a viewpoint must be considered with care.

Warfare and intervalley conflict were very much in evidence on the coast of Peru by the Early Intermediate Period, permitting Lanning to characterize the pre-Huari coastal cultures as having hilltop fortifications; burials showing violent ends; pottery, textiles, and murals depicting soldiers, battles, trophy heads, and prisoners (Lanning, 1974, p. 81). However, this kind of evidence is not found in the contemporary Andahuaylas settlements. Instead, Andahuaylas appears to have been relatively tranquil and regionally isolated during the Early Intermediate Period and the ridge-top locations of the communities at this time seem to have been chosen for reasons other than defense.

Another explanation offered for locating pre-Inca settlements above intermontane valley floors is avoidance of periodic floods. This reasoning has been applied, for example, to Early Horizon settlements in the department of Amazonas (Shady and Rosas, 1980, pp. 122-123).

On the other hand, the probability that the pattern of the prehistoric ridge-top settlements of Andahuaylas reflects economic priorities is supported by ethnographic work by Stephen Brush on settlement locations in Uchucmarca, east of Cajamarca in the Marañon drainage. Brush observed that, as in Uchucmarca, most Andean hamlets, villages, and towns "are located on or near the line of demarcation between the *kichwa* and *jalka* zones" (Brush, 1977a, p. 32), just like the prehistoric ridge-top settlements of Andahuaylas. Likewise, in his work in the Marañon and Huallaga drainages, Fonseca has documented the same pattern of communities consciously striving to maintain control of two vertical production zones: a higher potato and pasture zone, called *jalka*, and a lower, more temperate, grain-producing sector, called *kichwa*. In the campesino world view, the ideal location of the *marka*, or nuclear community, is between the two zones. Fonseca characterized this world view as follows: "The *marka* is the nucleus, the *chaupi* [center] or umbilical cord of the entire community. It is here that the upper and lower parts meet (tinkuy); thus, the *marka* has a climate that is neither cold nor hot, but 'friendly.' It has a better landscape, 'the air is purer, one does not live oppressed as in the deep canyons.' Its location, nearly midway between the river and the highest peaks, permits an easy access for its inhabitants to the parcels of maize, tubers, and natural grasses" (Fonseca Martel, 1972, p. 324; my translation).

Thus, given this Andean view of the highland environment and our currently limited control of the full range of the archaeological, ethnographic, and environmental record, the ridge-top locations of the pre-Inca sites of Andahuaylas must be considered to reflect a variety of pressures. Such pressures could include the economic priorities stressed in this paper, as well as defence and protection from natural disaster, without the need to treat them as mutually exclusive.

Today, despite the political and economic perturbations that have altered both agriculture and animal husbandry, the people of Andahuaylas still see the valley as divided into the lower, temperate and irrigated basin, between 2900 and 3100 m., called "kichwa," and the upper slopes, called "jalka." The people now living in the valley bottom towns refer to themselves as "kichwa-simi" and to the residents of the upland, indigenous communities between 3600 and 4200 m. as "jalka-simi" (Quintana, 1967). This distinction, while predominantly Mestizo versus Quechua, also reflects the disruption of traditional land-holding patterns. The rich, irrigated valley-bottom lands are now largely reserved for cash-cropping, while the uplands are used for subsistence farming. A limited number of haciendas today control the irrigated valley-bottom lands for intensive single and cash crop production, including sugar cane (which generally consumes over three times more water than other food crops, e.g., maize). In contrast, indigenous communities are restricted to either lowland tenant farming or upland, generally unirrigated zones of potato, cañihua, and pasture lands. The antiquity of this modern division of production zones is undetermined but, from the archaeological evidence, operates in stark contrast to the pre-Huari economic and settlement patterns.

The archaeological contribution

Archaeological excavations at the site of Waywaka, located on the top of a prominent ridge overlooking the city of Andahuaylas, revealed a sequence of superimposed refuse deposits. The earliest of these began in the Initial Period and was marked by a distinctive ceramic tradition called Muyu Moqo. Overlying this earliest refuse, was a second pre-Huari occupation by a group with a very different ceramic complex, called Qasawirka. This second occupation probably dates to the Early Intermediate Period. The contrasts between the two pre-Huari occupations are clear and sharp and suggest that, at least by the Early Intermediate Period (just prior to the appearance of Huari), the inhabitants of this region experienced marked population growth as well as major economic transformations. The changes in population levels were large, leading me to believe that economic shifts revealed in the refuse were of a major order. Even more striking is the fact that these economic transformations appear to reflect an economy based on the pattern of highly intensive and diversified resource utilization now generally referred to as "verticality" or "vertical zonation."

Excavation, Stratigraphy, Ceramics, and Chronology

In 1954, in a cooperative effort between the University of California and the University of Cuzco, John H. Rowe and Oscar Núñez del Prado conducted a two-week surface survey for new sites, primarily in the Chumbao Valley (see fig. 1). They recorded collections from fifteen sites and, in addition to finding evidence of Huari and Inca influence, were able to define three new local ceramic styles. The first, called Qasawirka after the site where it was first found (Ap2-1), seemed related to Derived Chanapata material. It was also found at the site of Waywaka beneath a stratum containing Huari-style sherds, further suggesting a pre-Middle Horizon temporal placement. The second style, Waywaka, resembled and was found associated with Huari sherds on the surface of the site of Waywaka and thus identified as the local imitation or derivative of the Huari style. Finally, at a site called Muyu Moqo (Ap2-10), Rowe and Núñez del Prado recovered a distinct style, which they named after the site. From the few sherds that they had found, it appeared at the time that there was some relationship between the Muyu Moqo and Qasawirka styles and Rowe suggested that the former might represent a local variant of the latter. However, the available information was minimal and Rowe had no strong basis for arguing one way or the other in the absence of any stratigraphic context (Rowe, 1956, 143-144).

With these investigations as background and Rowe's ethnographic and archaeological field notes for reference, I initiated stratigraphic excavations in 1970 (which extended into 1971) to establish a solid chronological sequence for Andahuaylas. I selected the multicomponent ridge-top site of Waywaka as the most likely to provide a clear occupation sequence.

Waywaka is a large habitation site occupying about fifteen acres atop one of the most prominent ridges overlooking the Chumbao Valley (figs. 1, 2). This ridge rises immediately above the modern city of Andahuaylas, nearly bisecting the valley. It also provides a clear view of both ends of the valley from its crest. The site is at an elevation of 3060 m., approximately 180 m. above the level of the Andahuaylas town plaza. The Andahuaylas-Huancabamba road borders the crest of the site on three sides. Between one and two meters of refuse are exposed in the road, and, below it, sherds can be collected almost to the bottom of the hill. Below the road the hill slopes steeply and it is doubtful that the original occupation extended to much more than 10-15 m. below its edge to the north and east (fig. 3).

The 1970-71 excavations at Waywaka had two goals: 1) to locate and document deep, multicomponent, stratified refuse; 2) to establish the extent of the refuse for each occupation phase. While a large areal excavation was strategically and financially out of the question, it was possible, in the eighteen-month season, to excavate and study a line of units across the top of the site.

The excavation units revealed a discontinuous sequence of occupations spanning thirty-five centuries of Andean culture history, from the Initial Period to the advent of Inca influence. The sequence of refuse layers validated each of Rowe's styles as a distinct unit of contemporaneity and showed their relative chronological relationship. The earliest style was Muyu Moqo, followed by Qasawirka, Huari, and then Waywaka occupations. Local collectors showed me examples of complete Cuzco Inca vessels that had been taken from graves at Waywaka. No Inca refuse was found, however, and it appears that Waywaka was used only as a burial site by the Incas (fig. 4).

Excavation and stratigraphy

Seven stratigraphic control units, with a total volume of 23 $m.^3$, were excavated to sterile subsoil (180-200 cm. below the surface) along a 120 m. transect across the crest of Waywaka, providing a discontinuous, horizontal and vertical profile across one axis of the site (fig. 3). The transect was oriented to bisect the short axis of the settlement. The location of the transect was restricted by the presence of a large radio tower and buried ground wires, which radiated from the antenna base in all directions over fifty percent of the site. The transect was located far enough to the northwest of the antenna to minimize disturbance from a lower density of subterranean copper wires (ca. 25 cm. deep).

Of the stratigraphic cuts, 5 measured 1 × 2 m., 2 units were connected into a 1 × 2 m. trench (units C and G, fig. 4), and an extension 1 m. square was added to this trench to expose a large, intrusive pit containing a considerable assortment of ceramics dating to the terminal phase of the Initial Period occupation. Finally, a 2 × 3 m. unit was opened on the southwestern edge of a gently sloping ridge to expose an Early Intermediate Period cistern associated with the Qasawirka occupation and destroyed sometime after the Middle Horizon (Unit F, Structure 3).

The long chronological record was completely represented only on the crest of Waywaka. Units A, B, and F, to the east and west, revealed only Early Intermediate Period occupation refuse capped by a thick deposit of slope wash (fig. 5). On the crest, however, undisturbed, primary vertical stratigraphy, coupled with the chronologically controlled lateral differences, served as a basis for projecting prehistoric demographic shifts on this single ridge top from about 2000 B.C. to 1400 A.D.

The surface was covered by plowed fields alternating with patches of fallow areas covered by a mantle of thickly-rooted crabgrass. The plowed soil (fig. 4, Level I) was clearly distinguishable from the underlying, dark-brown, compact clay deposit (Level II) of debris apparently dating to the Early Intermediate Period and Middle Horizon, with the clay-permeated deposit probably derived from the erosion of the upper courses of stone- and adobe-topped walls.

Underlying this hard cap of Early Intermediate Period, Qasawirka refuse was 130 cm. of Initial Period deposits, composed of superimposed, dark-brown, friable deposits of occupation debris separated from one another by a series of lighter-tan, sandy, friable deposits of undetermined origin. These sandy deposits may represent fill for new living surfaces, serving as a buffer against the organically rich refuse of the earlier occupants. In Unit G, strata III-VI (III-V in Unit C) were distinguished and excavated as natural deposition units, identified by sharp contrasts in color, compaction, and parent materials, down to a depth of 93 cm. below the surface. These strata contained only Muyu Moqo style ceramic sherds. Beneath them, and down to bedrock, the refuse was a homogeneous, dark-brown, sandy matrix with no clearcut divisions. Within this matrix, however, a lens of white ash at 103 cm., suggesting the presence of an old surface, served as the basis for separating strata VI and VII in Unit C (VII and VIII in G). The lowest strata, or rather layers, between 103 cm. and sterile, were subdivided more or less arbitrarily, in Unit C, at 127 and 140 cm. below surface level. These breaks proved of critical importance in establishing the chronologically distinct subphases of this Initial Period occupation. Bedrock was encountered between about 150 and 172 cm. in depth. The sterile base was marked by an undulating deposit of light-tan decomposed granite, which was both hard and impervious to water. It is possible, given the relatively small area indicated for the earliest Initial Period deposits, that this underlying bedrock deposit was exposed in lateral areas and served as a source of the fill encountered in the upper strata of the Initial

Period deposits (see also fig. 87).

The decision to subdivide the lower Muyu Moqo deposits at 127 cm. was not entirely arbitrary, even though no sharp distinction in color or compaction of the matrix was apparent. Nevertheless, a subtle change in the uniformly dark-brown, friable refuse was indicated by the appearance of light-colored chunks of clayish soil, which occurred in an ill-defined area but became more dense as depth increased. Although no burial outlines or pit shapes were evident at this point, these chunks of hard yellow clay corresponded to the uppermost fill of twelve of the fifteen human burials found associated with the Initial Period deposits. The ill-defined burial pit outlines averaged 20 cm. in perceptible depth, with the deepest extending to 26 cm. below the top of the pit rim. The burial pit fill and outlines were generally indistinguishable in color from the surrounding matrix. However, upon drying, subtle differences in compaction, detected with an ice pick, permitted the definition and removal of the intrusive burial fill materials from the undisturbed lower deposits into which they had been cut. Once these intrusions had been isolated and removed, the arbitrary break at 140 cm. permitted the isolation of undisturbed deep deposits from the mixed fill of the more recent, intrusive Initial Period burials. While all refuse excavated from all strata throughout the sequence was screened through a one-quarter inch mesh, the lower Initial Period deposits were sifted through one-sixteenth inch window screening to recover additional traces of gold foil and ground stone beads, which had initially been found in association with the human burials (Grossman, 1972a).

Because of the relatively small sample size and great stylistic diversity, rather than trying to subdivide them, strata III-V of Unit C (Unit G, III-VI) were treated as a single unit of contemporaneity; they contained only the most recent Initial Period materials, Phase C-D. Phase B sherds were found isolated between 103 and 127 cm. below the surface (Unit C, VII; Unit G, VIII). Finally, the earliest cultural materials, Muyu Moqo Phase A, were isolated as a distinct unit of contemporaneity in the lowest levels, between 127 cm. and bedrock.

Thus, less than two meters of deposition provided a clear and undisturbed stratigraphic record of five distinct ceramic phases and cultural occupations in Andahuaylas: three phases of Initial Period occupation refuse; a single phase of subsequent Qasawirka peoples; and finally, a thin surface deposit of Late Intermediate Period occupation refuse.

Continuity and change in the Initial Period ceramics

The stratigraphic sequence just described permitted the subdivision of the Initial Period component into three phases of the Muyu Moqo style, designated A, B, and C-D. Each phase represents a discrete unit of contemporaneity and each was defined on the basis of features of style and technology found consistently associated in the ceramics from a specific stratigraphic context. Furthermore, each phase is distinguished from the preceding one by elements of style or methods of manufacture that appear as innovations not found in the earlier ceramics.

The units of analysis were restricted to those strata or pit contents that, based on physical evidence alone, demonstrated a clear unit of stratigraphic isolation without mixture or cross-mends with ceramic fragments from other strata. This approach both restricted the final sample and excluded those deposits that showed evidence of mixing or contamination.

The excavations yielded a total sample of 42,616 ceramic sherds from all refuse sampled. Of this total, 11,236 sherds (26.3%) were excluded from analysis because they came from mixed fill or slope wash with limited chronological control. The analytical sample was further reduced by the exclusion of an additional 16,956 sherds (39.3%) from the dense concentrations of thumbnail-sized sherds in the thin surface plow zone, comprising mixed Middle Horizon and Late Intermediate Period refuse. There remained a sample of 14,624 sherds from unmixed Qasawirka and Muyu Moqo refuse deposits, amounting to 34.3% of the total excavated sample; of these sherds, 13.9% were decorated or otherwise diagnostic specimens. This selected sample showed marked contrasts in the number and density of ceramics through time (Table 1).

Table 1

Sherd Distribution at Waywaka

Ceramic style	Unit Stratum	Total	Diagnostic	Density
Qasawirka	F III-VIII C II B VIII-XII G II E II	9,363	1,110	3,742/m^3
Muyu Moqo C-D	C III-IV G III-V D V, pit fill, VI-VII	3,971	743	1,991/m^3
Muyu Moqo B	C VI-VII G VII-VIII	568	96	1,136/m^3
Muyu Moqo A	C VIII-IX G IX E VII	722	91	527/m^3
Totals		14,624	2,040	

All three phases of the Muyu Moqo style share a limited repertoire of vessel forms and decorative techniques. Nonetheless, each phase is characterized by a distinctive combination of thickness, color, paste, rim form, and surface finish on both decorated and plain vessels. I shall summarize the predominant characteristics here; for further details and illustrations the reader should consult my dissertation (Grossman, 1972b).

Muyu Moqo Phase A (figs. 7-19) Sample: 722 (91 diagnostic)

The earliest manifestation of the Muyu Moqo ceramic style is characterized by a limited number of vessel forms, together with a set of three technical features not present in the subsequent phases of this style. All Phase A rim sherds share a thin flat lip (4.0-4.5 mm. thick), sharply squared off as if the potter had drawn a flat spatulate instrument over the lip while the clay was still plastic and damp, leaving a small (1 mm.) ledge on each side (figs. 6, A; 7). All Phase A sherds are distinguished by a smooth dull surface of a dark purplish-brown color (5YR 3/2 to 2/2; *Munsell book of color*, Munsell Color Company, Inc., Baltimore, 1929), suggesting use of a thin watery wash or unpigmented slip. On a few sherds there are also widely spaced burnishing marks on the vessel body or shoulder, though none were evident on the rim within one centimeter of the lip (fig. 7).

The paste shares the same dark purplish-brown color as the surfaces. The only inclusions are small, irregular, white sand grains (0.2-0.5 mm.), which may have been either natural inclusions or intentionally added temper (Arnold, 1972; 1975). None of the Phase A sherds shows any evidence, either on the surface or in section, of the micaceous flecks found in later phases. The Phase A paste is softer than that of later phases and gives off a dull thump when struck, in contrast to the ping of subsequent Muyu Moqo ceramics. The Phase A sherds also have a markedly low specific gravity (0.8 gm./ml.) and appear to have been fired at either lower or less controlled temperatures than those of phases B or C-D.

These technological features and lip form are embodied in a limited repertoire of basic vessel shapes. Neckless ollas cluster in three size ranges, at 22-23 cm., 15-18 cm., and 10-13 cm. in diameter; some have smoothly convex curves to the lip, while others have a more or less sharply inflected rim (figs. 8-13). Small bowls have a slightly constricted opening, nearly vertical or slightly convex sides, and rounded bottoms that are slightly less than half their diameter in depth (figs. 14-15). A small, closed-mouth olla has a short neck (figs. 16-17).

Two spout fragments (figs. 18-19) suggest the presence of spouted bottles of undefined form. One fragment (fig. 18) is unique to the collection and the shape appears to have dropped out of the Muyu Moqo stylistic repertoire after Phase A. This spout is nearly twice as wide as it is high, forming a broad mammiform shape in vertical section. The second spout fragment from the Muyu Moqo A deposits (fig. 19) is of equal height and width, with convex sides, and is similar in its proportions to Phase B and C-D examples. Both the Phase A specimens, however, are distinguishable from the later forms by the slightly bulbous, convex outline of the lower part of the spout; the Phase C-D forms (figs. 34-41) have convex to straight vertical outlines. Moreover, both Phase A spouts were produced by rolling a single slab of clay into a cone, whereas all subsequent spouts were produced from stacked coils of clay, smoothed on the exterior surface, and perforated from the top with a cylindrical or conical tool to make a uniform opening in the last coil (figs. 26, 34-36).

Except for a two-element, vertical strap handle (e.g., fig. 10) formed by the application of joined rectangular strips (later varieties also have two elements, but cylindrical ones), the only Phase A ceramic decorations are incisions and punctations applied to the flattened lip of different vessel forms. The incisions occur as parallel lines of two varieties, one set (fig. 9) made with a thin sharp instrument like a flake; the other (fig. 16) with a wider rounded instrument. The third kind of lip decoration consists of small, wedge-shaped punctations (fig. 13) made with a small pointed tip. It is not clear, from their subtle nature, if the marks were meant as decoration or as an early manifestation of the identifying maker's marks documented by Donnan on Moche pottery and among modern potters in Peru (Donnan, 1971).

No conical or flat bases were found, indeed, no bases could be distinguished in the sample. From the general shape of larger body sherds, however, it appears probable that both Phase A and Phase B vessels had smoothly rounded bottoms.

Muyu Moqo Phase B (figs. 20-26) Sample: 568 (96 diagnostic)

Phase B ceramics are distinguishable from those of the previous phase by consistent differences in surface finish, paste, sherd thickness, and color. The most salient distinction is the universal use of extensive surface burnishing on both body and rim of all vessels. The most visible effect of this innovation is to obliterate the sharp edges so characteristic of the Phase A rims, making all lips smooth and rounded (figs. 6, B; 20). Coupled with this surface treatment is a sherd thickness of between 6 and 8 mm., an increase of 2-4 mm. over the average for Phase A sherds. The Phase B sherds are also distinguished by changes in paste composition and color. The uniform purplish-brown color of the Phase A vessels gives way to a greater range of colors, from light and dark reddish-brown to light and dark grays. The apparently larger and heavier vessels and the greater densities and specific gravity (2.125 gm./ml.) suggest changes in firing technology. The Phase B potters appear to have fired at higher temperatures and under both oxidizing and reducing conditions.

Despite these innovations in technology, the vessel forms of the earlier repertoire are basically continuous except for the mammiform bottle spout. In the category of neckless ollas, however, the three distinct size groupings give way to two, the two larger ones having blended into a general category of large neckless ollas that range in diameter from 20 to 30 cm. at the lip. The smaller ollas with sharply inflected rims also continue. This form represented a separate, culturally recognized, vessel category, as indicated by the consistent use of decorative lip scalloping only on these smaller vessels.

Although scalloped lips may have begun to appear by the end of Phase A, this kind of decoration became more common and appears to have supplanted the use of labial incision in Phase B. There are three variants in the height and placement of the rim scallops: a slight but regular undulation in the lip with no appreciable difference in size between the peaks and valleys (figs. 21-22); two or more dips separated by a long straight horizontal section (figs. 23-24); a series of rounded peaks separated by wider, even dips (fig. 25). Finally, there is a single Phase B sherd with a scalloped rim, bearing, on the interior, two, well-defined impressed circles, probably made with a cane tube (Grossman, 1972b, pl. LVIII fig. 152). This specimen represents the only example of interior rim decoration.

Bottle spouts, as noted above, are similar in proportion to both earlier and later specimens. They are made in the same manner as the Phase C-D examples (fig. 26).

Muyu Moqo Phase C-D (figs. 27-44) Sample: 3971 (743 diagnostic)

Phase C-D of the Muyu Moqo style is characterized on the one hand by continuity with preceding vessel forms and, on the other, by various innovations in both vessel shapes and design motifs. While the array of new decorative motifs easily distinguishes this later material, it may also be identified by innovations in manufacturing techniques used on the traditional forms. Both traditional and new forms show consistent contrasts with the earlier materials in paste and surface finish, rim and lip treatment, sherd thickness, and color.

Although there is a great deal of variation in the paste of Phase C-D ceramics, all vessel forms that are definitely derived from earlier ones exhibit a uniform, light-reddish-brown to tan paste and surface. While most sherds show the same small, irregular, off-white, granular inclusions as the earlier examples, the Phase C-D specimens are also characterized by the presence of numerous micaceous inclusions visible in the section and on the surfaces of sherds. Furthermore, there is a continuation of the trend for ollas to be thicker than their antecedents. While the Phase B neckless ollas averaged 6-8 mm. thick, the

Phase C-D examples range between 11 and 12 mm. Finally, these later materials are further distinguished by an innovation consistently used in finishing the lip. Phase C-D lips are flattened, but differently from those of Phase A. Instead of simply flattening the lip with a single swipe of a spatulate instrument, as in Phase A, the potters who made the C-D material took great care to make the edges of the lip even and smooth by careful burnishing and wiping (figs. 6, C-D; 30-33; 43). These lips are distinguishable from those of Phase A because they lack the characteristic overhanging ledges, and from the rounded lips of Phase B in having carefully smoothed edge angles.

The neckless ollas continue as the predominant vessel form, with both inflected and large categories but with slight shifts in the rim orientation (figs. 27-33). In addition to the flat lip discussed above, the Phase C-D potters also oriented the rim either in or out, thus giving it an interior or exterior bevel. The small round-bottomed bowls continue and are nearly identical in size and shape to their antecedents but distinguished from them by a consistently light-tan paste and smooth matte surface. Further continuity with earlier vessel forms is indicated by eight conical bottle spouts recovered from the upper Phase C-D refuse (figs. 34-41). Two forms are apparent, a conical spout of approximately equal height and width, which ranges from 2.5 to 3.3 cm., and two examples of a shorter spout, nearly cylindrical in vertical section. Despite these variations in form, all Phase C-D spout fragments are distinguished from Phase A and B specimens by the presence of a flat lip; all were constructed of three coils; and the interior of each shows a smooth cylindrical segment at the top, as if a round dowel had been pushed into the opening after the coils were joined. Thus, from Phase A to Phase C-D, the Muyu Moqo bottle spout seems to change in form from a wide mammiform shape to a short, straight- to convex-sided, conical shape of equal height and width.

Finally, three small carinated body sherds with notches or impressions at the inflection point were also found (Grossman, 1972b, pl. LVII figs. 143-145). The fact that one of these specimens was recovered from Phase A contexts, while the other two came from Phase C-D strata, suggests that this element was used throughout the Muyu Moqo sequence.

Despite the clear continuity of some vessel forms into Phase C-D, a variety of new forms and modes of decoration present innovations with no known antecedents. Perhaps the most radical departure from earlier vessel shapes is represented by a series of large and medium-sized necked jars (fig. 42). The jars vary in the shape and proportion of the neck as well as the angle and form of the shoulder. Aside from these differences, each of these jars has a slightly flaring lip, which appears to have been formed by adding a thin strip of clay around the outside of the mouth. The distinct jar forms also vary in the extent to which the horizontal lip band was smoothed and shaped, as well as in the orientation and degree of flare in the neck portion of the sherds. Other innovations found in the Phase C-D deposits include one example of zone punctation on a red-slipped, closed jar (fig. 43) and one sherd with a streaked red surface, which appears to have been scraped or burnished with a chunk of reddish ochre.

The distinction between traditional and nontraditional forms in the Phase C-D ceramics coincides with differences in decorative technique. The new jar forms were consistently decorated with a series of appliqué fillets and pellets with punctations. This technique used both rows and columns of fillets and pellets on the jar necks and shoulders (e.g., fig. 42), wide bands of horizontal fillets at the juncture of neck and body, and a series of fillets with punctations in straight or wavy lines on body sherds of vessels of unknown shape (Grossman, 1972b, pl. LXIII).

The use of appliqué fillets in Muyu Moqo C-D was not limited to vessels. Numerous fragments were reconstructed into most of the upper torso of a hollow, coil-made, Muyu Moqo style figurine (fig. 44). The wrist of the left arm was decorated with an appliqué ring with punctations, the hand defined by four punctations. About the neck is a horizontal appliqué band with punctations and pendent appliqué strips. Below the collar and between the pendent strips, is a row of punctate pellets. A hole through the elbow joint of the left arm indicates that the whole figurine may have been suspended by a cord. The paste shares the same fine-grained texture and light-tan color that distinguishes all other Phase C-D ceramics.

The traditional vessel shapes of the Phase C-D olla forms are also associated with a series of decorative innovations, which distinguish these forms from their Phase A and B antecedents. The most distinctive innovation is the decoration of neckless ollas with a horizontal ridge bearing vertical notches (figs. 27-33). Although there is considerable variation in the shape of the ledge and the kind of incisions or notches used, the ridge is always smoothly bonded to the vessel surface and always positioned between the rim and the shoulder but never either on the shoulder itself or on the widest part of the vessel.

The use of scalloping appears to continue into Phase C-D but with subtle modifications in form and composition. The use of horizontal separation between indentations that characterized the Phase B pieces appears to drop out of use and instead the scallops are continuous and even.

These changes, combined with those in color, rim form, and sherd thickness serve to establish consistent, distinct attributes for each of the three stratigraphically defined ceramic phases. The continuity represented throughout and the degree of innovation evident in the last phase suggest both a long tradition of indigenous development and the later infusion of new and probably foreign vessel forms, decorative techniques, and kinds of clay during the final phase of the Muyu Moqo style.

Chronological indicators

The upper and lower limits of the Muyu Moqo style can be placed in time by a combination of approaches. Stratigraphic superposition orders the three phases and is confirmed by stylistic seriation. The antiquity of the Phase A and B materials is indicated by radiocarbon age determinations, while Phase C-D can be linked stylistically to other early styles from different parts of Peru.

Stylistic parallels

Strong parallels exist in specific features of design and decoration between the Muyu Moqo style, most notably Phase C-D, and Initial Period styles from other regions of Peru (fig. 46). On the north coast, at the site of Huaca Prieta in the Viru Valley, Bird recorded a neckless olla form, of the Initial Period Guañape style, with a discontinuous horizontal nicked ridge (Junius Bird, personal communication, 1971). In the southern sierra, Karen Mohr Châvez recorded the same combination in early contexts at the sites of Pikicallepata and Marcavalle (Châvez, 1969, p. 51 fig. n; 1982-83, pt. III, p. 324). The Muyu Moqo C-D neckless olla form with nicked ridges is most similar to her examples from the earliest phase of the Marcavalle-style occupation at Pikicallepata. All phases of the Marcavalle style show other parallels with Phase C-D of the Muyu Moqo style, including punctate and plain fillets and carinated vessels. Perhaps the most striking parallel to the Muyu Moqo C-D neckless ollas comes from the south coast site of Hacha in the Acari Valley, where John Rowe and Dorothy Menzel recorded two varieties of large neckless ollas with horizontal notched ridges, one with a discontinuous ridge like the Guañape example, the other with a continuous ridge like the Muyu Moqo Phase C-D examples.

There are somewhat less precise similarities in figurines. A single fragmentary figurine was recorded by John Rowe in 1946 in the private collection of César Zanabria, a former resident of Andahuaylas, then a student of Rowe's at the University of Cuzco. Zanabria had found the fragment on the surface of the site of Waywaka. It represents the torso and head of an anthropomorphic figure of indeterminate sex (fig. 45). The body is a biconvex oval slab of solid clay with a sculpted, high-bridged nose smoothed onto the surface. The eyes and mouth are formed with appliqué pellets, with oval punctations for the pupils and an incision in the partly worn off mouth pellet, suggesting a "coffee bean" form. The arms, formed by pinching out ridges from the main slab, extend from the front and sides of the torso. Although the piece has no reliable association, the distinctive appliqué pellets are almost identical to those used to decorate some of the innovative vessel forms in the Muyu Moqo C-D refuse, including the hollow figurine shown in fig. 44. Further reason to assign the fragment to Muyu Moqo C-D is its distinctive light-tan paste and surface color, a paste found only in Phase C-D of Muyu Moqo, not the earlier phases, and markedly different from that of the subsequent Qasawirka style.

Solid figurines have been reported from early sites both on the coast and in the south highlands. Feldman has reported solid clay figurines from the Preceramic and Initial Period site of Aspero (Feldman, 1980, pp. 148-153) and Grieder from the site of Las Haldas, where they were associated with other attributes similar to Muyu Moqo C-D, including neckless ollas with beveled lips, burnished surfaces, punctation, and modeling, as well as filleting and other relief additions (Grieder, 1976, pp. 106-107). In the southern sierra, solid clay anthropomorphic figurines were recovered at the site of Marcavalle from both surface and excavation contexts (Châvez, 1982-83, pt. II, pp. 107-112, figs. 21-22). Like the Andahuaylas figurines, these examples are biconvex in cross section, have solid arms molded at the sides and bent over the abdomen and, in several cases, appliqué pellets with punctation for features. Apparently this tradition continued in the Cuzco Basin, for Rowe also found solid figurines associated with Chanapata-style pottery in his excavations (Rowe, 1944, figs. 14-12, 14-16, 15-1).

Finally, the most striking parallels in form and technical features to this figurine fragment come not from Peru but from Machalilla sites on the coast of Ecuador. Although there are hollow Machalilla figurines, most are solid biconvex forms with elongated torsos, pinched out arms, a pronounced aquiline nose, and appliqué pellets to define mouth and eyes (Lathrap, Collier, and Chandra, 1975, p. 40 fig. 52, p. 85 nos. 241-254).

The extent of these specific stylistic similarities strongly suggests that there existed, throughout the highlands and coastal areas of the Central Andes, widespread commonly held ideas about vessel form and decoration as well as figurine design during the last epochs of the Initial Period, well before the spread of the Chavin style marked the advent of the Early Horizon.

Table 2

Radiocarbon Determinations from Initial Period Contexts at Waywaka

Associated Ceramics	UCLA Sample	Material	Provenience	^{14}C Determination Years B.P. (1950)	Uncorrected Dates B.C./A.D.	Calibrated Dates*
Muyu Moqo B	1808F	Charcoal	W 29 N 0 (G) level VII, 90-103 cm.	2660 ± 250	700 ± 250 B.C. 950-450 B.C.	1255-405 B.C. or 1420-185 B.C.
	1808I	Charcoal	W 27 N 0 (C) level VI, 90-103 cm.	3240 ± 210	1290 ± 210 B.C. 1500-1080 B.C.	1950-1110 B.C.
Muyu Moqo A	1808E	Charcoal	W 29 N 0 (G) level VII, 103-127 cm.	3550 ± 100	1600 ± 100 B.C. 1700-1500 B.C.	2180-1680 B.C.
	1808A	Charcoal	W 27 N 0 (C) level IX, 127 cm.-sterile	3440 ± 110	1490 ± 110 B.C. 1600-1400 B.C.	2000-1565 B.C.
	1808J	Charcoal	W 27 N 0 (C) level IX, 140 cm.-sterile	3185 ± 160	1235 ± 160 B.C. 1395-1075 B.C.	1770-1115 B.C.
	1808D	Charcoal	W 29 N 0 (G) level IX, pit 1, 145-218 cm.	2200 ± 430	250 ± 430 B.C. 680 B.C.-170 A.D.	815 B.C.-145 A.D.

*Calibrations at the 95% confidence level (Klein and others, 1982, Table 2).

Radiocarbon determinations

There were no dateable carbon samples from refuse associated with Muyu Moqo C-D ceramics. Six samples, however, were taken in clear association with the undisturbed lower deposits of the Muyu Moqo refuse containing Phase A and B ceramics. Each of these samples was derived from solid wood charcoal and all six were processed at the U.C.L.A. Radiocarbon Laboratory under the direction of Rainer Berger. Table 2 summarizes the information from these radiocarbon age determinations. They have been calibrated against the most recently published calibration table, which provides ranges at the 95% confidence level (Klein and others, 1982, Table 2). It should be noted that the range increases markedly as the uncertainty of the measurement increases. Since there is no calibrated value between an uncertainty of 200 and one of 300 years, for example, and since sample 1808F has a 250 year sigma, I have provided ranges for both values; the difference in range is not 200 years, however, but 385. Using the new calibration table, then, rather than the large, but, still mildly useful, ranges of 200-500 years of the uncorrected dates (omitting sample 1808D), we find a minimum range of 435 years and a maximum of 1235 (still omitting sample 1808D).

On the basis of radiocarbon determinations alone, it is possible to say only that Muyu Moqo A and B probably both date to the second millennium B.C. Fortunately, we have indisputable stratigraphic evidence as well as a clear-cut stylistic sequence to order the phases properly. While no calendric date can be ascribed directly to Muyu Moqo C-D, there are determinations associated with material that relates stylistically to this phase. Taking Châvez's earliest determinations from Marcavalle, Grieder's determinations for the early part of the "terminal occupation" at Las Haldas, and the two determinations from Hacha (Châvez, 1977, pp. 1142-1147; Grieder, 1976, p. 109; Rowe, 1963, p. 5), and calibrating them on the 1982 table, we find that it would not be unreasonable to consider all of this material as dating to the second half of the second millennium B.C.[1] The same is true for the earliest phase of the Marcavalle-style occupation at Pikicallepata (Châvez, 1982-83, pt. I, p. 241) and the estimated date for the Machalilla occupation in Ecuador (Lathrap, Collier, and Chandra, 1975, p. 16).

All the material just mentioned is stylistically related to Muyu Moqo Phase C-D and seems to date uniformly to the second half of the second millennium B.C.; thus, we can tentatively assign the same date to the Muyu Moqo C-D material. The strata containing Muyu Moqo C-D ceramics lie in undisturbed superposition above those containing Muyu Moqo A and B ceramics. Moreover, the ordering of these three ceramic phases is confirmed by stylistic seriation. Therefore, we can safely argue that Muyu Moqo A and B ceramics were produced at a time no later than the second half of the second millennium B.C., and such a placement agrees with all the radiocarbon determinations on Muyu Moqo A and B material with the exception of sample 1808D, which clearly falls outside of the first sigma.

The Early Intermediate Period Qasawirka style (figs. 47-70)
Sample: 9363 (3791 diagnostic)

It is not yet possible to identify a distinct Early Horizon occupation in Andahuaylas and the historical and cultural relationship between the Muyu Moqo settlement and the subsequent Qasawirka occupation remains unclear. No radiocarbon determinations have been run on Qasawirka-associated material but stylistic and stratigraphic considerations would indicate that Qasawirka at least spans the Early Intermediate Period, since it lies above the Initial Period deposits and is capped by Late Intermediate Period debris. Stylistically it does not resemble any of the known Early Horizon ceramic complexes. Furthermore, the Qasawirka style appears to have continued until the advent of Huari influence in the region in Epoch 1B of the Middle Horizon. A few Qasawirka sherds utilized some Huari motifs and one sherd with distinctive Huari paste is decorated with a Qasawirka design.

The Qasawirka ceramic style is not only less securely dated but also less precisely defined than Muyu Moqo. While the overall contrast between the styles is striking, a few of the Muyu Moqo Phase C-D vessel forms appear similar to some of the Qasawirka forms and some decorative elements are also shared.

Qasawirka refuse was found consistently in stratigraphic superposition above Muyu Moqo refuse. Qasawirka ceramics are clearly distinguished from the Muyu Moqo style by consistent differences in vessel form, surface finish, paste, new design elements and compositions, new forms of surface modeling, the use of polychrome slips, and a diversity of anthropomorphic depictions both on face-neck vessels and in hollow clay figurines. Despite these innovations, all examples share marked similarities in paste and slip. The style contrasts with both preceding and subsequent styles in the nearly uniform use of a thick, oxblood-colored slip (Smithe, 1975; 7.5R 2.4/5.0). All vessels, regardless of shape and size, have an even, often glossy, burnished surface. The typical Qasawirka paste is distinguished in sherd cross sections by a coarse, irregular, dark-grayish to purple-brown color. While some larger sherds were uniformly fired to a light red or brown in an oxidizing environment, both the thicker, apparently utilitarian vessels and the smaller and thinner, "fancy" decorated pieces share a band of dark black paste occupying the center fifty percent of each sherd section, suggesting incomplete oxidation or a low oxygen firing atmosphere. These common paste colors are consistently associated with two kinds of inclusions: first, irregular, white and red, sandlike inclusions 1-3 mm. in size, which occur in a low density (20-30% by volume); second, larger (3-5 mm.) chunks of black, red, or granitic-looking white gravel inclusions, which occur more rarely (1-2 per sherd).

The Qasawirka style differs markedly from the Muyu Moqo style in the apparent separation of its entire range of forms and decorative motifs into two major categories: plain, apparently utilitarian shapes; and generally smaller, thin-walled, slip-decorated, fancy forms. There is also a series of new vessel forms.

The larger, predominantly plain, utilitarian forms are represented by four broad categories: large, necked jars (figs. 47-49); large, closed, necked ollas (figs. 50-51); wide, shallow, closed bowls (fig. 52); undecorated small closed bowls.

Perhaps the most distinctive innovation among the common plain forms is the large, necked jar, with compound neck and rim. The neck is generally convex in profile with a sharp break at both rim and shoulder (figs. 47-48). The rim, measuring between 8 and 10 cm. diameter at the mouth, is either thick and rounded (fig. 48) or has a thickened outer lip with an exterior bevel that angles sharply inward, thus forming a flange (fig. 47). All recognizable jar bases are conical. The most common decoration on these necked jars is either an even horizontal incision at the break between the shoulder and the neck or a series of appliqué knobs around the base of the convex portion of the neck. The jars may be unslipped and burnished smooth or covered with the distinctive oxblood slip (fig. 53). Although the shared use of appliqué pellets at the base of jar necks is not sufficient to argue clear continuity between Muyu Moqo C-D and Qasawirka, it does provide a stylistic similarity between these two styles at the same site.

The large, necked ollas are common and have a thickened, rounded, and outwardly flaring rim with a broad, round lip treatment. The large, closed bowls, which are also common, have thickened rims and broad, slightly curved, flattened lips.

Neither plain nor precisely fancy, is a common bowl form with a distinctive compound shape: convex walls topped by a flaring, everted rim with a sharply angled lip. This form is commonly found with red slip on both the interior and exterior of the vessel, and often with monochrome design elements, consisting of crosses or elongated hatched triangles, executed in gray slip on the interior bevel of the flaring rim (figs. 54-56). The rims range from one with a slightly thickened and everted lip with interior bevel to a flaring, outward angled one, 1.5 cm. wide, with a slightly thinned and sharply curved lip. This bowl form ranges from 17 to 21 cm. in diameter and is uniformly slipped on the interior with the distinctive oxblood Qasawirka slip. These bowls may also have, on the exterior below the rim, slipped bands containing hatched diamonds or rectangles or chevrons and large dots, bounded in gray, black, or red bands on a cream or oxblood background of burnished slip (figs. 57-60).

The fancy vessels, which are smaller and thin-walled, are generally entirely slipped with either oxblood or a cream to grayish-tan ground, decorated with red, white, black, and gray slips. The most common such fancy form is small bowls, both open and closed, with a variety of rim treatments. Predominating in the Qasawirka refuse levels of the Waywaka excavations, as well as in surface collections from other sites, are two small and one slightly larger varieties of fancy decorated bowl forms. The first is a small, thin-walled, open bowl, 13-14 cm. in diameter, with slightly convex to straight, widely flaring sides (figs. 61-62). The second small bowl is closed, 10-13 cm. in diameter, with convex sides (fig. 63). Both these forms are of uniform thickness overall, the lips finished to a gradually thinned sharp edge. Both, regardless of exterior decoration, are finished with a band of red slip on both sides of the lip and rim, with a uniform cream or off-white, thick, burnished slip on the interior below the rim (figs. 65, 67). The same lip treatment is shared with larger closed bowls (fig. 64).

The style is further distinguished by the presence of a considerable amount of plastic decoration including hand-modeled, face-neck jars and distinctive hollow figurines. All of the face-neck fragments share noses that are well formed, with straight to slightly curved bridges, and have triangular cross sections. The eyes all have a socket defined by a deep, curved and tapered, horizontal incision and a long, oval, thick upper lid (fig. 68). One complete jar face neck shows a protruding lower lip with a perforation suggesting use of a labret (Grossman, 1972b, pl. LXXX). Fragments of two figurine heads and one complete figurine also suggest facial decoration by horizontal bands of red or gray slip (figs. 69-70) or incisions across the cheeks and eyebrows and, in the complete jar neck, by long, horizontal incisions across the cheeks.

Chronological considerations

That the Qasawirka refuse is probably Early Intermediate Period in date is suggested by its polychrome-slipped ceramic repertoire and its stratigraphic placement as well as by its association with certain architectural remains. These are the remains of four, widely spaced, double-faced fieldstone walls, which cut into or rested on the Initial Period, Muyu Moqo strata from the base of the Qasawirka refuse. All four walls are oriented parallel to the long axis of the site. A distinctive sherd discovered in the clay mortar of one of these walls suggests that the wall was constructed sometime after Epoch 1B of the Middle Horizon. This sherd, a small, undecorated, tongue-shaped tip of a spoon handle, has a fine-grained tan paste and thin, watery, orange slip. It is very different from Qasawirka style and, although undecorated, is closest in style to Ocros and Chakipampa B style spoon fragments, which are common in Middle Horizon 1B refuse deposits in the Ayacucho region (Menzel, 1969, fig. 54; Benavides Calle, ms., lâm. XIX, fotos 10A-E). As this fragment had to be included in the clay mortar when the wall was built, it follows that this one wall postdates or is contemporary with Epoch 1B of the Middle Horizon, so that the surrounding and underlying Qasawirka refuse must predate Middle Horizon 1B. Furthermore, while some of the other buildings with double-faced stone walls could have been built by Qasawirka peoples, the common alignment of these four walls suggests central planning. This suggestion, together with the dated wall, lead to a consideration of the possibility that, at least by Epoch 1B of the Middle Horizon, the site of Waywaka consisted of a large planned settlement with rectilinear buildings.

Whatever the nature of Huari influence in Andahuaylas, it is clear that the traditional settlements of the Qasawirka peoples were not, at least, destroyed. Not only were the two ceramic styles found in association, but also an exchange of motifs is evident on the pottery, suggesting that the two societies may have lived together for some time after the advent of Huari influence. A fine-grained, light-orange sherd of distinctively Huari-style paste was recovered bearing an equally distinctive local Qasawirka design (fig. 66), of a sort found on pure Qasawirka sherds (compare fig. 67), consisting of a crosshatched diamond in cream on a red background, outlined with a thick, black border. The mixture of local decorative motifs and foreign manufacturing techniques and forms suggests that the two cultures coexisted for a period of time and that the Qasawirka style continued at least until Middle Horizon 1B.

Further evidence of Huari influence is found in the influx of fancy Huari ceramics imported from the Ayacucho homeland of the Huari style. In addition to the numerous small Huari-style sherds recovered from the plow zone covering the Qasawirka occupation, a large fragment of a fancy Ayacucho Serpent Bowl (fig. 71) was found by a teacher at the Colegio de Andahuaylas. It was recovered at a depth of 1.5 m. in a 4 m. deep pit, visible in the road cut, which had been cut through the overlying slope wash into the buried Qasawirka refuse beneath. This vessl fragment, with its characteristic fine-grained, orange paste, further demonstrates that Huari influence was visibly established in the region of Andahuaylas by Epoch 1B of the Middle Horizon.

Finally, several late Huari-style sherds from the plow zone surface of Waywaka indicate that influences from Ayacucho may have continued into Epoch 2A and possibly 2B of the Middle Horizon. One such example is a decorated rim sherd from a Viñaque-style, straight-sided cup (fig. 72). The fragment, which has a fine orange paste, was found on the surface. No distinct Middle Horizon deposits were identified in the excavation other than these examples from the thin plow zone. It is possible that Huari occupation levels were present at one time, however. The thick cap of mixed, Late Intermediate Period slope wash found on the flanks of the site, overlying buried Qasawirka deposits, suggests extensive erosion of the uppermost strata. Such erosion probably occurred not only at Waywaka, but at other ridge-top sites in Andahuaylas after the Middle Horizon.

Initial Period Economic Indicators

The changes in ceramics between the Muyu Moqo and Qasawirka occupations were paralleled by shifts in both economy and diet. The economic patterns of the Muyu Moqo peoples can be inferred from multiple lines of evidence, which include settlement size, animal and plant remains, projectile points (probably for hunting), and food storage and food processing equipment. There are also clues to diet in the human remains from burials recovered from the Muyu Moqo Phase A and B strata at Waywaka.

Settlement size

Muyu Moqo settlements are few in number and small in size. So far, the style is represented at only two sites in the region: Waywaka, where it is found in the lowest refuse deposits; and the type site, Muyu Moqo (Ap2-10), located on the Andahuaylas-Huancabamba road, on a ridge at 3300 m., slightly higher than Waywaka (see fig. 1). At Waywaka, the Muyu Moqo deposit appears to be restricted to the crest of the ridge and limited to an area only 40 m. wide. Although the extent of the deposit was delimited along only one axis, if it parallels the outline of the later surface refuse, the Muyu Moqo settlement would have covered an area no greater than 2700 m^2, or about 1/3 ha. No evidence of any masonry structures was encountered in association with the Muyu Moqo occupation refuse. Chunks of burned clay bearing charred cane and twig impressions indicate that the Muyu Moqo peoples may have lived in frame and thatch structures that were covered with mud (Grossman, 1972b, pl. LXXVII). Whatever the nature of Muyu Moqo economy and subsistence, throughout the Initial Period, this settlement was small in size with relatively few inhabitants. Even though increases in the extent of the Phase C-D Muyu Moqo refuse suggest that the settlement may have doubled in size, to about 5000 m^2 (ca. 2/3 ha.), during the second millennium B.C., by the end of the Initial Period occupations, the Muyu Moqo refuse still occupied less than 1/10 of the area of the Qasawirka occupation (fig. 3).

Animal remains

Animal bones are well preserved in the Muyu Moqo refuse, and, while both few in number and low in density, are relatively diversified (Table 3).[2] Diagnostic bones averaged no more than three or four per excavation level in each of the three phases of the Muyu Moqo refuse.

Table 3

Initial Period Identified Bone (1971)

Muyu Moqo Phase	Strata	Camelids Number/%	Cervids Number/%	Cavia Number/%	Total Number/%
C-D	C III-IV	8	2	0	10
	E IV	0	1	0	1
	G III-IV	6	0	1	7
C-D Totals		14/77.8%	3/16.7%	1/5.56%	18/100%
A+B	C VII-IX	2	4	3	9
	G VI-IX	7	3	2	12
A+B Totals		9/42.9%	7/33.3%	5/23.8%	21/100%

Olson studied a total of 226 disarticulated bone fragments from the 10 strata of Phase A and B refuse (Unit C, levels VII-IX; Unit G, levels VI-IX; and level VI of both Unit E and Unit D) and could identify only 21, or 8%. In addition to the identifications noted for phases A and B in Table 3, Olson found in the sample from Unit E, level IV, one possible viscacha bone (*Lagidium*, sp.). This animal is still considered a delicacy and is hunted for its meat and pelt by modern campesinos.

The same pattern of low density of a variety of species appears to have continued into the final phase of the Muyu Moqo occupation. In the 5 unmixed levels of Phase C-D refuse, only 149 bone fragments were recovered, of which Olson identified 18, or 12%. Besides the three classes of animal included in Table 3, there was one sawed-off scapula from a feline smaller than an adult puma (Unit G, level V), possibly representing an ocelot or an Andean wildcat (*osqollu*), still common in the highlands (John Rowe, personal communication, 1971), and one scapula from a medium-sized bird (Unit E, V), identified only as being larger than a duck.

Given the small size of the sample and the small number of identifiable specimens per level, no attempt was made to project minimum numbers of animals or any other reconstruction of age or body weight patterns. What can be said is that despite the relatively large volume of refuse excavated, all three kinds of animal were represented in small quantity, with comparable numbers of diagnostic elements for guinea pig, deer, and camelid. Thus, while all of the identified species of animals were probably used as sources of meat by the Muyu Moqo people, the record seems to indicate that control of these resources was less than intensive for any one potential meat source.

While the deer were most probably being hunted, the guinea pig may have been domesticated, although the situation is ambiguous because guinea pigs exist wild in the sierra today and these ancient remains could have come from animals caught in the wild (John Rowe, personal communication, 1971). Nevertheless, a combination of insights from the ethnographic and archaeological record suggest that the Initial Period *Cavia* might have been domesticated. Today it is said that domesticated guinea pigs have become almost completely dependent on human support and will "die if left alone for several days and/or if they are kept away from the kitchen area" (Andrews, 1975, p. 130); of course we do not know the antiquity of this pattern. Now, while the bones that were recovered from excavation indicate only that the animals were probably being eaten, in the course of excavation my native field assistants identified charred guinea pig feces in the Muyu Moqo refuse, suggesting that the animals were actually living in the Muyu Moqo houses.

The question of camelid domestication by these peoples is another matter. The mere presence of camelid bones is not sufficient to demonstrate domestication. Until we can securely determine domestication from an examination of the morphology of a single bone, evidence for it will have to come from other sources. While some scholars have utilized the proportion of young animals represented as an indicator of domestication, others have pointed out how the naturally high infant mortality among camelids could account for high ratios without human intervention (J. Pires-Ferreira and others, 1976). And Rick has observed a high proportion of juveniles in the food remains of the hunting camp refuse of Pachamachay cave, dating to 7000-10,000 B.C., suggesting selective hunting practices at a time before domestication is probable (Rick, 1980, p. 297). Accordingly, I do not think that we can reasonably suggest that a group was domesticating and controlling access to large numbers of camelids until or unless we can demonstrate that they utilized large numbers of these animals in large concentrations outside of their natural habitat.

In establishing criteria for distinguishing the archaeological remains of herding communities, Wing argued that the record must also indicate a low species diversity, with a clear predominance of one or two species (Wing, 1977, p. 124). Based on these criteria, and given the low density of all species identified in the Muyu Moqo refuse as well as the lack of any clear predominance of camelids over either deer or guinea pigs, it appears doubtful that the Muyu Moqo peoples were animal breeders. Instead, although it has been pointed out that camelid domestication was probably a long-term process involving shifting patterns of human intervention and herd management (J. Pires-Ferreira and others, 1976), a clear orientation towards camelids does not become apparent in the archaeological record of Waywaka until the Qasawirka occupation at the site.

Further evidence suggesting some engagement in hunting by the Muyu Moqo peoples is to be found in seven obsidian projectile points from strata of all three phases of Muyu Moqo refuse (figs. 73-85). All 7 points are small triangular forms with concave bases and slightly convex sides, measuring 1.7-2.2 cm. in length, and weighing 0.48-2.24 gm. They were produced from at least two varieties of obsidian, one opaque and black, the other grayer and slightly translucent. Each point shows irregular primary and secondary bifacial chipping along the edges. One of the Phase A points and two from Phase B associations also have slightly serrated edges. The two Phase C-D examples, despite their general similarity to the earlier specimens in size and shape, are distinguished from them in having one side slightly longer than the other, forming a spur and an asymmetrical base.

Like the neckless olla ceramic forms characteristic of the Muyu Moqo peoples, the small concave-based point seems to have been widely distributed throughout the southern highlands and coastal regions of Peru during the late Preceramic and early Initial Period (see fig. 46). The Phase A and B Muyu Moqo points are almost identical to the late-Preceramic Piki-type points of MacNeish's Cachi Phase in Ayacucho, which he dates to about 4000-2000 B.C. (MacNeish and others, 1970, pp. 40-41; personal communication, Richard MacNeish, 1971). Similar small concave-based points have been reported from late Preceramic and early Initial Period contexts at Ichuña in Moquegua (Menghin and Schroeder, 1957), at Arcata in Arequipa (Schroeder, 1958), from the early ceramic sites of Qaluyu in Puno and Pikicallepata near Sicuani (Chávez, 1969; 1977), from the Initial Period coastal site of Hacha (collected by Rowe and Menzel; personal communication, John Rowe, 1971), and from both late Preceramic and early ceramic refuse levels in the Punta Pichalo sites of northern coastal Chile (Bird, 1943, p. 259). From the evidence presently available, it appears that this small, triangular concave-based form, in addition to its wide geographical spread, may have been made from the later part of the Preceramic stage possibly until the Early Horizon, with no significant change in style or workmanship to mark the introduction of pottery into these areas. This pattern of regional and temporal uniformity suggests the possibility that there was also a continuation of Preceramic hunting patterns, whatever they may have been, through the Initial Period, and possibly into the Early Horizon in southern Peru.

Evidence for plant utilization

Evidence for the consumption of plant products is largely inferential. Both metate and mano fragments were recovered in the lowest Muyu Moqo levels, where there were also pits, presumably for storage. Human remains also provided evidence regarding diet.

The excavations into the deeper refuse deposits at Waywaka revealed a total of 15 human burials associated with the Phase A and B occupations: 7 adult males; 2 adult females; 2 adults whose sex could not be determined; 3 younger people, between 6 and 21 years of age; and 2 infants.[3] All had been placed in shallow, oval graves, in a flexed position, with good-sized cobbles scattered over the torso (figs. 86, 87). None of these Initial Period burials contained any ceramic offerings. Four of the adult males and one of the adult females, however, were found with associated ground-stone beads, of lapis lazuli and chrysocolla, as burial offerings. Inserted between the front teeth of one of these males, was a ground lapis lazuli bead with a piece of hammered gold threaded through its perforation (Grossman, 1972a; 1972b).

The Initial Period highland population represented in these burials showed at least two instances of violent death, as well as a variety of other health problems. One male skull seemed to evidence anterior-posterior cranial deformation, an early instance of this subsequently widespread Andean cosmetic practice (Grossman, 1972b, pl. XXVII fig. 33). One burial of a young adult consisted only of a severed forearm and articulated hand, cleanly cut at the elbow, while another, of an adult male, showed a massive fracture of the right side of the jaw, suggesting death from a violent blow with a blunt instrument. Whatever their cause, these indicators of violence suggest a less than placid and possibly an insecure lifestyle for these Muyu Moqo peoples.

Evidence of disease was also present. Burial 9, an adult male, showed extreme abnormal bone browth on the tip of a fibula, suggesting possible osteosarcoma (Grossman, 1972b, pp. 62-64, pl. XXVI). The adult male associated with the bead and gold appeared to be of advanced age and in poor health, as suggested by the fact that his skull was thick and spongy. He also had few teeth and suffered from alveolar recession. Indeed, most of the adults of both sexes had poor teeth with numerous caries, extensive plaque near the root line, evidence of heavy tooth grinding, as well as alveolar recession. Both the build-up of plaque and dental caries are often associated with the consumption of carbohydrates, especially grains. Plaque leads to tooth and gum disease and finally alveolar recession. In this case, both the human remains and the grinding stones suggest the consumption of grain. Precisely which grains were being grown and ground is partially reflected in preserved plant remains.

Plant remains

The human remains, grinding tools and storage pits clearly suggest that the Muyu Moqo peoples, like their Initial Period coastal neighbors, were relying not only on meat from hunted wild animals and possibly domesticated guinea pigs but also cultivating and processing some varieties of food plants. Although far from providing a complete inventory of cultigens, the excavation at this exposed highland site recovered the remains of six distinct seed types indicating that, at least by Phase C-D, the Muyu Moqo peoples were cultivating both the common bean and what appear to be at least two, and possibly three, kinds of indigenous grains: amaranth, cañihua, and probably quinoa. There was not, however, any indication of corn being present at this time.

In the course of the excavations, large carbonized seed fragments were recovered from a pit filled with stones and Phase C-D Muyu Moqo ceramics (Unit D, level VI). These fire-preserved remains were of the common bean, *Phaseolus vulgaris* (fig. 88). The presence of this primary food source in early highland contexts is not unique. In the Cuzco basin to the south, *Phaseolus* was found associated with late Marcavalle ceramics (Châvez, 1982-83, pt. I, p. 243), and these southern highland occurrences postdate the earliest Peruvian highland presence of the common bean by at least 5000 years (Kaplan, Lynch, and Smith, 1973).

The Muyu Moqo refuse strata also contained the carbonized remains of seeds that are too small to be recovered in the 1/4 and 1/16 inch mesh screens used in the excavation. The recovery by flotation of such minute remains (figs. 89-92) has significantly expanded our knowledge of the prehistoric food base of the Muyu Moqo peoples (see Appendix). The presence of two, and possibly three, varieties of both small and large chenopods and/or amaranth in the Initial Period at Waywaka provides more data to the discussion regarding when quinoa was developed as a critical food source in Andean prehistory. In 1965, with reference to the development of nonshattering varieties of wheat in the Old World, Simmons speculated that the large-seeded delayed-shattering attributes of quinoa, as compared to cañihua, represented "cultivated characteristics" resulting from human selection (Simmonds, 1965, p. 234). While he had no archaeological evidence to work with, subsequent controlled stratigraphic excavations and the study of ethnobotanical remains from the long sequence of Preceramic and Initial Period deposits from Pachamachay Cave (excavated by John Rick and analyzed by Deborah Pearsall) support Simmonds' original conjecture as well as suggesting when the large-seeded quinoa may have become available in the Peruvian highlands.

Pearsall's analysis of chenopod sizes demonstrates clear contrasts between the Preceramic remains and subsequent remains associated with ceramics, as well as a consistent trend towards increased seed size through time. In the lower Preceramic strata, dating to around the seventh millennium B.C., Pearsall recorded only small chenopod (and/or amaranth) seeds, 1 mm. or less in diameter. In more recent strata, however, dating to around the second millennium B.C., besides the small seeds, she recorded larger ones, above 1.0 mm. in diameter (Pearsall, 1980, p. 198 Table 9.1). These contrasts in size through time suggest that, while the smaller-seeded chenopod, cañihua, may have been collected or harvested from Preceramic times, the larger-seeded quinoa probably did not appear until the Initial Period. Pearsall also observed the presence of parched and heat-puffed seed forms only in the preceramic levels of the site, suggesting a functional relationship between parching and the availability of ceramics (Pearsall, 1980, p. 198). The presence of both small and large chenopod and/or amaranth types, even though not identified by species, together with parching, suggests that quinoa had become available as a distinct grain type by sometime in the Initial Period. The presence of both size ranges as well as parched, puffed forms in the Muyu Moqo refuse suggests that the Initial Period residents of Waywaka were exploiting both these highly productive and protein rich indigenous grain types in the intermontane valleys of Andahuaylas as well, with or without maize to complement their mixed hunting and agricultural food base.

Despite the good preservation of other organic remains in both Muyu Moqo and Qasawirka refuse at Waywaka, no maize cobs or kernels were recovered in the course of excavation. Moreover, no carbonized maize was found with the small carbonized chenopods recovered by flotation, although the sample subject to this process was rather small. As an additional test for the presence of maize, portions of the same sample were submitted to Dolores Piperno at the University of Pennsylvania for phytolith analysis. None of the large, cross-shaped phytoliths characteristic of maize was identified, however, in the Waywaka sample. Piperno reported that the sample contained large numbers of phytoliths but, of the twenty-three examples of cross-shaped phytoliths observed, only one approached the larger size range and no "extra-large" maizelike varieties were found. Piperno concluded that the size ranges encountered overlapped with the expected range of wild grasses and that, based on the criterion of size, the presence of maize could not be suggested for the Muyu Moqo Phase B sample. this interpretation should be viewed with caution, however, because of the newness of the technique and the lack of adequate comparative samples from Peru. Nevertheless, the combination of the lack of carbonized maize remains in both screened and flotation samples and the negative result of the phytolith analysis suggests that maize was not a primary staple for the occupants of Waywaka during the Initial Period.

In this context, it is worth noting that there is little evidence for early maize from the highlands. Only in MacNeish's excavations at Ayachucho do we have claims for very early highland maize. Karen Châvez does, however, report evidence of maize in deposits from the Cuzco Basin associated with Chanapata-like ceramics, which she dates to ca. 200 B.C. (Châvez, 1982-83, pt. I, pp. 243-244). In contrast, the presence of maize in the preceramic Vegas site on the south coast of Ecuador has been argued for as early as 6000 B.C., on the basis of phytolith analysis (Piperno, ms.).

Not only is the appearance of maize as a critical resource late in the archaeological record of the south highlands, but also it may have been less than essential in more recent times. Brush has stressed that maize is of less importance than other highland crops, like potatoes and quinoa, to the upland agro-pastoralists of Peru (Brush, 1977a, p. 10; see also Webster, 1971). His viewpoint coincides with the observations of earlier scholars such as Carl Sauer, who noted that maize was not a staple in the diets of most American populations south of Honduras (Sauer, 1950, p. 494). As Murra commented subsequently, maize appears to have been more important to Inca culture as a ceremonial crop than as a subsistence crop (Murra, 1960). In Andahuaylas today, maize and quinoa are grown in the same field in the *kichwa* zone below 3100 m. It may be that the rows of quinoa are interspersed with the rows of maize to protect the fragile quinoa stalks, which tend to break in the strong highland winds. Whatever other reasons the indigenous farmers may have for interplanting the two crops today, the sturdier corn stalks do act as wind breaks shielding the weaker quinoa. This planting pattern may go back at least to the Late Horizon, as suggested by the inclusion of both quinoa and maize in the famous golden garden of the Sun in Cuzco (Murra, 1960, footnote 60).

While the importance of maize remains in question for preconquest Andean cultures, the use and significance of other indigenous highland grains is clear both today and in antiquity. It may be only apparent, because of the small sample, but it may be functionally significant that there is a correlation between highland areas of intensive quinoa and cañihua production today and the areas with archaeological evidence of relatively late maize cultivation in antiquity.

The two chenopods (*C. pallidicaule* and *C. quinoa*) together with the related cultivated and wild varieties of *Amaranthus*, fill an important environmental production niche and also play a key nutritional role in the highland, intermontane, mixed agro-pastoral food complex of tubers, grains, and camelids (Gade, 1970; Tschopik, 1946). While long recognized as important Inca and pre-Inca crops, both sorts of grain have received less than intensive treatment as a primary food source in the literature of social and economic change in pre-Inca Peru (Safford, 1917; Gade, 1970; Simmonds, 1965; National Academy of Sciences, 1975, p. 9). Chenopods share the characteristic of growing in profusion with high grain yields in both cultivated and wild contexts. Recent controlled experiments with Mexican varieties of domesticated amaranth at the Rodale Research Center in Pennsylvania produced yields of 800-1000 pounds per acre (Ruttle, 1976). Similar experiments with Andean chenopods produced comparable high yields of seeds per unit area. León recorded cañihua harvests of 600-2000 kg./ha. with yield increasing with altitude (León, 1964, p. 66). Furthermore, Rodale Research Center experiments suggest that the amaranth and chenopod yields increase with greater plant density. In one controlled planting with spacing of only 10 inches, the domesticated Bolivian amaranth yielded a total of 16,000 seed-producing plants/acre and extreme yields of 2.3 tons/acre (Ruttle, 1976; Edwards, 1981b).

These high yields are paralleled by high nutritional values for all three native Andean grains. Both quinoa and cañihua produce 14-15% protein per unit weight, and contain about 32% more protein than does maize. They are equivalent in nutritional value to dry whole milk and unusually high concentrations of the essential amino acid lycine, lacking in most food plants (Gade, 1970, p. 55; Simmonds, 1965, p. 230; León, 1964). Moreover, the leaves of quinoa are often boiled like spinach (Rowe, 1946, p. 210) and those of cañihua are burned for their high calcium content to make ash to chew with coca leaves (Gade, 1970).

The importance of these indigenous highland grain crops to highland agriculture today is reflected in measurements of relative effort expended on different subsistence activities in the agro-pastoral economy of Nuñoa. Throughout the year, the people of Nuñoa spend about as much time and energy on these grains as they do on the various potato crops, with slightly more effort expended on the small seed cañihua than on quinoa because of the extra effort required to process the smaller-sized grains (Thomas, 1973, p. 82).

Thus, even without maize, the Initial Period Muyu Moqo peoples would have had ready access to sufficient proteins, carbohydrates, and essential amino acids for proper nutrition. Moreover, while the botanical evidence from Andahuaylas is limited to beans and several varities of indigenous grains, evidence from contemporary sites in other parts of Peru suggests that the Muyu Moqo peoples may have engaged in a wider range of plant cultivation, with or without irrigation. It has been clearly established that, by the time of the earliest Muyu Moqo settlement, coastal peoples already had access to a wide variety of food cultigens, many of which were probably domesticated elsewhere (Patterson, 1971, p. 220; Cohen, 1979, p. 34). Rowe and Menzel noted the presence of abundant cotton, beans, squash, guava, and peanuts, in addition to marine shell refuse, at the Initial Period site of Hacha located 21 km. from the sea. As in the Marcavalle and Muyu Moqo deposits, however, no maize was present (Rowe, 1963, pp. 6-7). Likewise, using the indirect evidence of processing tools, Lathrap has suggested that the inhabitants of the tropical lowlands were engaged in manioc cultivation as early as the second millennium B.C. (Lathrap, 1970, p. 57). And closer to Andahuaylas, MacNeish reported a diversity of food plants (including gourd, quinoa, amaranth, squash, lũcuma, and possibly maize) in association with his preceramic Chihua phase, which he dates to almost a thousand years before the earliest Muyu Moqo occupation in Andahuaylas (MacNeish, 1969, p. 40).

Metallurgy and trade

Although their settlements were small in size and their economy apparently mixed, the Muyu Moqo people were neither regionally isolated nor lacking in technological capability. Two unexpected results of the Waywaka excavations were evidence of metal working and long-distance trade. Muyu Moqo A refuse revealed the existence of the earliest metal technology in South America. Bits of gold foil and a gold worker's tool kit showed that these people not only had metal, but were producing hammered metal foil as early as the beginning of the second millennium B.C. (Grossman, 1972a). Several independent categories of evidence for long-distance exchange during the Muyu Moqo occupation in Andahuaylas suggest that these people participated in a variety of trade networks extending over long distances throughout highland and coastal Peru and northern Chile.

Contact with the coast, 250 km. to the west at its closest point, is documented by 4 examples of marine mollusks. Fragments of marine mussel shell (*Mytilus* sp.) were found associated with all three phases of the Muyu Moqo sequence (figs. 94-95). A single fragment of shell of a white, sand-dwelling marine clam was recovered from mixed Phase A and Phase B contexts (Unit E, level VII) (fig. 93).

There is also evidence that the Muyu Moqo peoples were obtaining obsidian from at least three different sources during Phase A times and from at least four or five different sources by Phase C-D (Burger and Asaro, 1979, p. 298 Cuadro 3). According to neutron activation studies of Muyu Moqo obsidian flakes from Waywaka, the most common source of high grade obsidian (23% of the specimens) came from Quispisisa in the department of Huancavelica, about 160 km. north of Waywaka. A second source, closer to Andahuaylas, in the Pampas River Valley, was identified in obsidian from both the Muyu Moqo levels and from the late Initial Period coastal site of Hacha (Burger and Asaro, 1979, p. 310).

Yet more distant trading is indicated by some of the semi-precious stones that were recovered from Phase A and B Muyu Moqo refuse (Grossman, 1972a; 1972b; ms. b). Among the varieties of such stones that could be identified by the staff at the University of Engineering in Lima were chrysocolla, turquoise, dumortierite, aquamarine, and lapis lazuli. According to these experts, all but lapis lazuli have been recorded in natural deposits in the department of Apurimac or in the adjacent departments of Ayacucho, Ica, Cuzco, or Arequipa. Lapis lazuli, however, is not known to occur in Peru, in spite of reports to the contrary. To date, the only verified deposits of this stone are located within the boundaries of modern Chile. Georg Petersen, in a study of minerals in archaeological and natural contexts, places the northernmost occurrence of lapis lazuli in the northern Atacama desert of Chile, and notes that in all cases to the contrary, the identified pieces turned out to be similar in appearance but a different mineral (Petersen, 1970, p. 13). Finished lapis lazuli beads are known from at least three other early sites in Peru: Minaspata, near Cuzco, where Edward Dwyer found "30 to 40 lapis lazuli and shell beads associated with a human burial, beneath the floor of a Marcavalle house" (personal communication, Edward Dwyer, 1975); the site of Ichuña in Moquegua (Menghin and Schroeder, 1957); and the central coast site of Asia I (Engel, 1963).

In this context, it is important to note that, while the other varieties of semi-precious stones were found both worked and unworked at Waywaka, lapis lazuli was encountered only as finely worked beads. This distinction suggests that the other stones may have originated locally but the lapis lazuli beads were traded into Peru in a finished state. If northern Chile is the only source of this material, then the early Initial Period inhabitants of Peru who buried or lost lapis lazuli beads in their refuse must have been getting it from Chile. Either people were traveling between the two areas to procure them or the beads were being traded from group to group.

All this evidence is pertinent to any economic reconstruction because it helps to alter some previous assumptions about the relative economic fluidity of Initial Period peoples before the spread of Chavin religion around 1000 B.C. Until recently, the Initial Period has been depicted as a time of regional isolation with little or no interaction among the widely spaced early pottery-making peoples of the Andean area.

It was said, for example, that "life during the Initial Period was circumscribed by cultural and geographical barriers, and people were content not to look far beyond them" (Lanning, 1967, p. 95). There was no question that people were moving about, but this movement was seen as taking place only over relatively short distances and between adjacent regions. For example, work by Patterson on the central coast suggested the seasonal movement of peoples during the late Preceramic and Early Initial Period, but only within the confines of particular valley drainages (Patterson, 1971; 1973). More recently Paulsen (1974) has argued for long-distance trade in the Early Horizon between the Ecuadorian coast and highlands, evidenced in copper, *Spondylus* and *Strombus* shells, and metallurgical materials available only in regions foreign to their place of archaeological discovery. Again, however, these Ecuadorian data show little concrete evidence for any long-distance exchange networks during Initial Period times, prior to around 1000 B.C. In contrast, the implications of the Andahuaylas evidence are, of course, that despite their small numbers, the Muyu Moqo peoples at Waywaka, as well as other highland peoples around Cuzco and Moquegua and coastal ones at Asia, were engaged in long-distance trade networks of some sort at least as early as the second millennium B.C.

Early Intermediate Period Demographic and Economic Change

In addition to the innovations in ceramic style, which marked the establishment of a distinctive regional culture, the Waywaka excavations revealed marked contrasts in other cultural aspects between the Muyu Moqo remains and those of the subsequent Qasawirka settlement. There were parallel changes in stone tool technology and the composition of preserved animal remains as well as a significant increase in both settlement size and local population densities in the Andahuaylas area during the Early Intermediate Period. In the light of contemporary Andean analogs, these changes suggest a significant economic reorientation or transformation in the Andahuaylas region.

Settlement size

In terms of the size and number of sites, the Qasawirka ceramic style is by far the best represented of any identified in the area. Of the 65 occupation sites located during the 1968-1971 surveys, 18 (about 28%) had indications of a major Qasawirka refuse component, and at least 5 of the Qasawirka sites identified so far have extensive refuse deposits, comparable in size to that on the crest of Waywaka (fig. 3). In other words, at least five of these settlements were probably sizeable villages or communities of at least several hundred inhabitants. The number and size of the Qasawirka settlements strongly suggest that the Early Intermediate Period was a time of relatively dense population in this part of the highlands. This pattern appears to hold not only for the intermontane basin of Andahuaylas but also for Early Intermediate Period occupations in the Ayacucho and Junin drainages to the north (Lumbreras, 1974, p. 139; Browman, 1976).

As noted, the Waywaka excavations indicate that the Qasawirka settlement at that site was much larger than the Muyu Moqo occupation of the same ridge top. Moreover, the areal expansion was not simply a series of surface scatters over a wide area; wherever I excavated the Qasawirka refuse was at least 30 cm. thick and the road cut around the northeast side of the site showed deep deposits of Qasawirka refuse at all points. Thus, the increased settlement area represents intensive occupation. A conservative calculation indicates an area of at least six hectares for the Qasawirka settlement, or a twentyfold increase over the size of the earliest Muyu Moqo settlement and a tenfold increase over the Phase C-D Muyu Moqo settlement (fig. 3). These figures argue strongly for a marked population increase by the Early Intermediate Period.

It is also clear that the geographical domain of the Qasawirka economy was not restricted to the lower, ridge-top, *kichwa* zone in which their sites are most visible today. Site survey in the upper, *jalka* zone, above 3600 m., documented 2 occupation sites within the confines of the modern community of Caquiabamba, which, because of the altitude, is restricted in its range of products to tubers, cañihua, and camelids. Because they were never systematically studied, it is not possible to define the relationship between these sites and the, apparently more numerous, ridge-top Qasawirka sites on the flanks of the lower valley. If modern ethnographic accounts are pertinent, however, it would not be unreasonable to speculate that the ancient inhabitants of Andahuaylas matched their fluctuating production schedule with a variety of shifting homesteads at various altitudes in much the same way as do nonmarket-oriented communities such as those documented by Webster (1971; 1973) and Palacios Ríos (1977).

Animal remains

Corresponding to the increment in settlement size was a massive increase in both the number and density of camelid remains in the Qasawirka refuse. Even on the basis of a preliminary field analysis, it was clear that the vast majority (80-90%) of the animal remains from the Qasawirka levels consisted of large camelid bones, with both llama and alpaca represented (personal communication, George Miller, 1975). The density of animal bones recovered from both primary Qasawirka refuse levels and from fill deposits is consistently higher by several orders of magnitude than that of the Initial Period refuse (Graph 1). The relative bone counts alone clearly show that between the end of the Initial Period and the Early Intermediate Period a significant change in the accessibility of camelids had taken place for the peoples living at the site of Waywaka. Because the Muyu Moqo and Qasawirka peoples lived at the same ridge-top location, these contrasts suggest that a major shift in economic orientation had occurred between the two occupations.

But these gross indications of change in economic orientation and the relative availability of camelids can now be augmented by a recently completed study of available faunal materials from all phases of the Waywaka sequence, carried out by George R. Miller and his students at California State University, Hayward. Miller was able to identify a total of 295 bones at, at least the family level. When these identifications were distilled to include only those from unmixed strata belonging to clear and identifiable stratigraphic units of contemporaneity, the total count of identified animal bone was 236, or 80% of all

Table 4

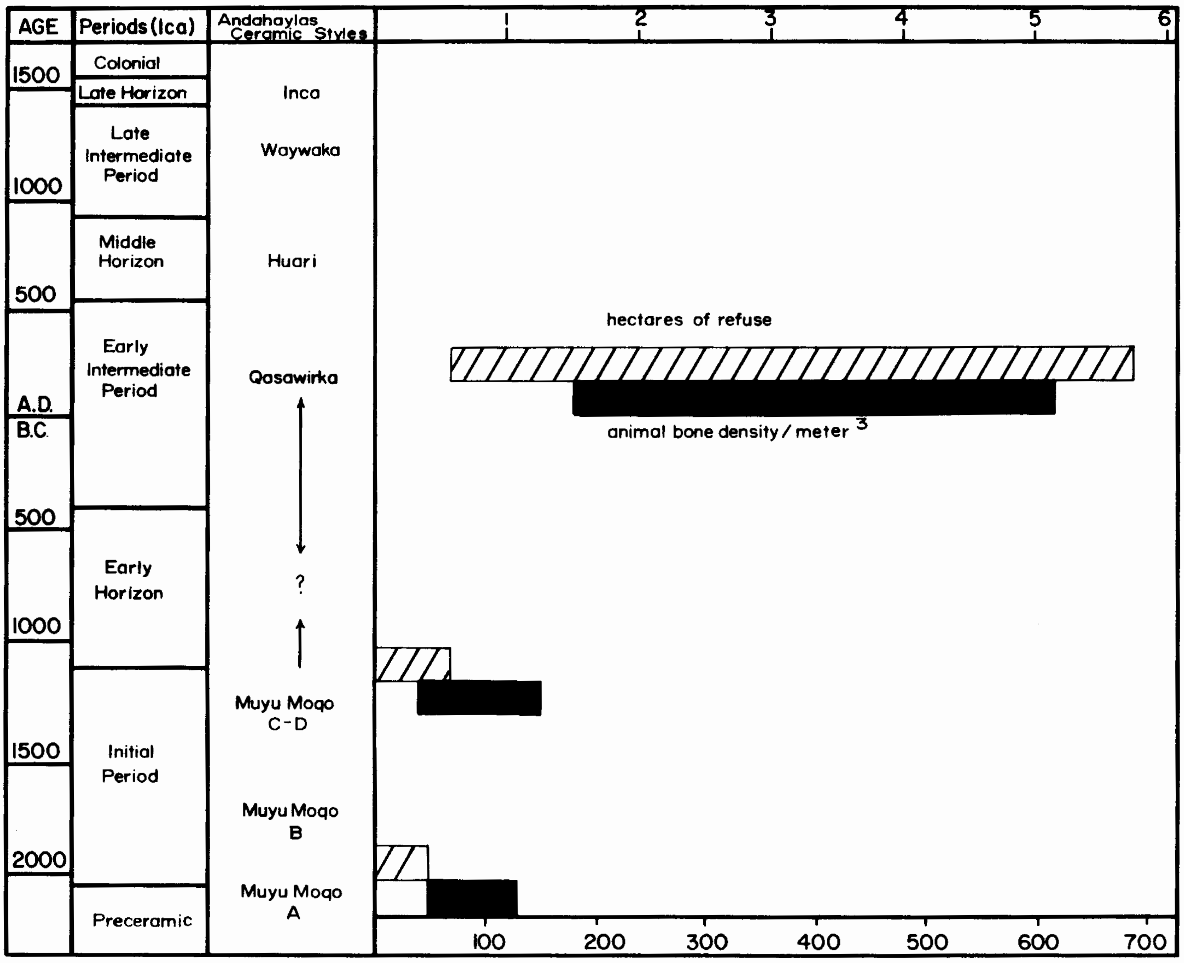
Initial Period and Early Intermediate Period Bone from Waywaka (1983 identifications)

Phase	Strata	Camelids		Cervids		Other		Totals
		#	%	#	%	#	%	(100%)
Qasawirka	F III-VIII	121	93.0	6	4.6	3	2.3	130
	C II	12	75.0	2	12.5	2	12.5	16
	G II	12	92.3	1	7.7	0	0	13
	E II	6	100.0	0	0	0	0	6
Qasawirka totals		151	91.5	9	5.5	5	3.0	165
Muyu Moqo C-D	C III-IV	5	41.6	4	33.3	3	25.0	12
	G III-V	6	75.0	1	12.5	1	12.5	8
	D VI-VII	13	86.6	1	6.6	1	6.6	15
Muyu Moqo C-D totals		24	68.6	6	17.1	5	14.3	35
Muyu Moqo B	C VI-VII	5	50.0	5	50.0	0	0	10
	G VI	4	100.0	0	0	0	0	4
Muyu Moqo B totals		9	64.3	5	35.7	0	0	14
Muyu Moqo A	C IX	4	80.0	1	20.0	0	0	5
	G VII-IX	12	70.5	5	29.5	0	0	17
Muyu Moqo A totals		16	72.7	6	27.3	0	0	22
Initial Period and Early Intermediate Period totals		200	84.7	26	11.0	10	4.2	236

identified elements, here presented in Table 4, which also provides the data upon which Graphs 2-4 are based.

Graph 1

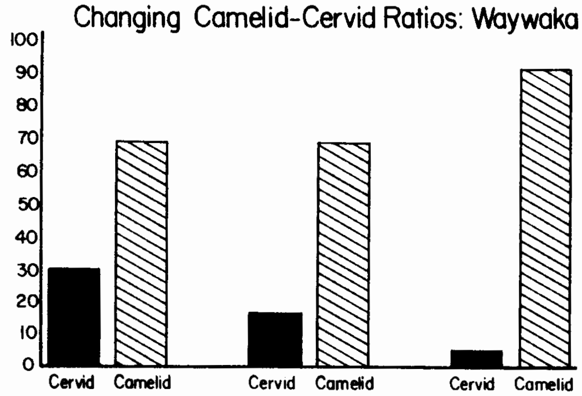
Change in Density of Bone Remains at Waywaka



Each of the following computer plots illustrates a sharp change through time in the relative percentages of camelids and deer.[4] The bar and line plots of Muyu Moqo A and B and Muyu Moqo C-D versus Qasawirka components show a consistent percentage of about 70% identifiable camelid bones throughout the Initial Period. The Qasawirka deposits, however, jump in concentration 20 points to over 90%. This increase in the proportion of camelid remains corresponds to a concomitant decline in the percentage of deer remains, from about 30% in the Initial Period to just over 5% in the Early Intermediate Period at Waywaka (Graphs 2, 3).

Graph 2

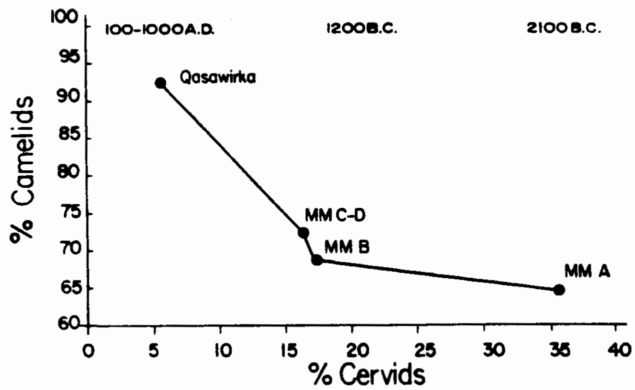
Changing Camelid-Cervid Ratios: Waywaka



The lineal regression plot shows this shift as a consistent inverse correlation through time. The correlation coefficient of -0.856 reflects a strong negative correlation between stratigraphically associated pairs of relative percentages of camelid versus deer for each of the four phases of the Waywaka sequence, spanning some twenty-five centuries before the Middle Horizon intrusion of Huari influence from Ayacucho.

Graph 3

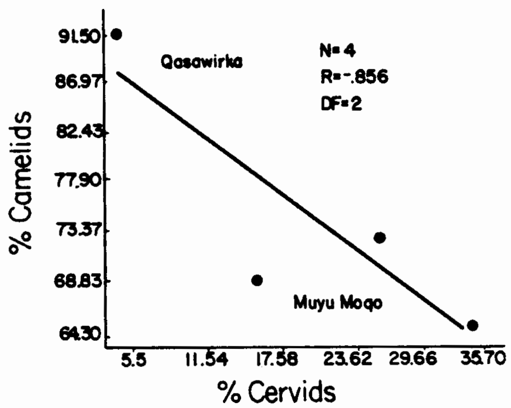
Changing Camelid-Cervid Ratios



These changing ratios at Waywaka are not unique to Andahuaylas. Elizabeth Wing has documented comparable shifts in the relative proportions of deer versus camelids through time in her summary of published faunal ratios from ten highland sites covering the same general time span, the end of the Preceramic to the Early Horizon (Wing, 1977, Gráfico 2). When the relative percentages that she presents are analyzed with the same computer-based, lineal-regression statistics program as the Waywaka data, the results show an almost identical, strong negative correlation of -0.807, indicating that, for each site considered, the lower the percentage of deer, the higher the percentage of camelid remains. Furthermore, as at Waywaka, these changing ratios are not random, but rather correspond to the relative antiquity of each chronologically controlled unit of contemporaneity or site in Wing's sample.

Graph 4

Lineal Regression Plot



Analysis of the animal remains from the vertically stratified cave site of Uchcumachay in Junin showed changes parallel to those documented at Waywaka and indicated that the shift in the relative abundance of camelids and deer was a long process, already well under way by the fifth millennium B.C. Bone counts from these vertically stratified deposits, spanning the period between 10,000 and 2500 B.C., provide comparative percentage ratios in 3 time periods. In the earliest period, 10,000-7000 B.C., the assemblage contains 37% deer bone and no camelid remains. By the second period, 7000-5500 B.C., there is a roughly equal ratio of 41% deer and 55% camelid. After 5500 B.C., however, this ratio shifts to reflect a marked predominance of between 82% and 84% camelids in the upper Preceramic strata. During this same time span, the deer remains decline to 17% and, finally, to a low of 14% by 2500 B.C. (E. Pires-Ferreira and others, 1977; Matos Mendieta, 1976, p. 53).

Other examples of a similar shift to a predominance of camelid remains are to be found at sites in the north-central Peruvian highlands and northern Chile. Excavations by Richard Burger, in domestic refuse deposits at the site of Chavin de Huantar, documented a stratified multiphase sequence extending from the later Initial Period through the Early Horizon, which showed that "remains of cervids (deer) were much more common with the late Initial Period materials than in the following phases; and in the Early Horizon phases, camelid remains were very frequent, comprising more than 90% of the fauna" (Burger, 1979, p. 150; my translation). Even on the more arid western slopes of the Andes, considerably below the natural range of highland pastures essential for camelid domestication, comparable shifts are found. In northern Chile, Pollard associated the increase in settlement size in the upper drainages (ca. 2800 m.) of the Rio Loa region of the Atacama Desert sometime between the first two centuries before and after the Christian era, with a marked increase in the refuse of both mature and immature llama bone together with several varieties of maize and other cultigens (Pollard, 1972, p. 43; Pollard and Drew, 1975, p. 299). And more recently, Dillehay has interpreted the appearance, in the lower Chillon Valley (ca. 2000 m.), of highland ceramic and architectural styles together with the "sudden appearance of larger quantities" of camelid remains, as indications of both economic influence and possible colonies of sierra peoples at least by the Early Intermediate Period (Dillehay, 1979).

At Waywaka, the shift in orientation toward camelids and the possibility of domestication are also suggested by other evidence. Two small, four-footed clay animals, which appear to represent camelids, were recovered from the Qasawirka refuse (figs. 96-97). It is not unreasonable to interpret these as Early Intermediate Period prototypes of the stone figures of llamas and alpacas ("caullama") associated with Inca ceremonies of ritual sacrifice for the health and fecundity of the herd animals (Rowe, 1946, p. 248). Although the heads are ill-defined or missing, both of the animal figurines have a similar treatment of the tail, semi-erect and pointed slightly downward but raised above the rump. In this regard, Gade has observed, "Llamas hold their tails in a semi-erect position while the tail of the alpaca is held flat against the rump" (Gade, 1969, p. 340). This feature suggests that the small Qasawirka figurines were meant to represent llamas, and the figurines themselves suggest that the llama was of both economic and religious importance at least by the Early Intermediate Period in Andahuaylas. The presence of the figurines in the Qasawirka refuse suggests that these Early Intermediate Period peoples may also have made ritual offerings for the well-being of camelid herds.

Furthermore, considering the ecological and nutritional needs of the alpaca and llama, it is clear that the animals being used or killed at Waywaka were not being raised there. The site is far below the altitude range necessary for the maintenance of healthy herds. Indeed, the increase in camelid remains at Waywaka can only mean that the Qasawirka peoples controlled or had easy access to large numbers of camelids in the upland pasture areas.

Despite the increased significance of camelids and the low percentages of deer bone in the refuse, it is apparent that the white-tailed deer continued to have a special significance for the Qasawirka peoples. A deer burial was found in an intrusive pit cutting from the Early Intermediate Period deposits into Muyu Moqo strata (fig. 98). The deer had been doubled up on its back in a small pit; its legs were missing; the top of its cranium was severed from the mandible and placed to the side; and a chunk of turquoise or chrysocolla was found in the lower jaw. These associations appear to have been intentional and probably indicate a ceremonial burial of this animal by the Qasawirka people.

While projectile points were not entirely lacking in the Qasawirka refuse, they did show changes in material, form, and function, contrasting with the small, concave-based obsidian points characteristic not only of Muyu Moqo but of other late Preceramic and Initial Period point forms. Both the distinctive concave base and the barb appear to drop out at the same time as there is a significant increase in point size in the Qasawirka style. Although most Qasawirka points are fragmentary and recovered from mixed associations, one incomplete specimen from pure Qasawirka associations has a rounded base, indicating an almond or teardrop shape. There are four additional obsidian points, possibly fragments of knives or projectile points, which are large, elongated, laurel-leaf or oval forms with irregular rounded bases. Although broken, each was much heavier than the Muyu Moqo points, weighing 3.2-5.1 gm., suggesting complete weights in excess of 6-10 gm.; the original lengths would have been at least 6 cm. Each specimen is distinguished by irregular bilateral secondary edge chipping with large primary scars defining both surfaces.

Evidence of plant utilization

There is little in the way of direct evidence for plant utilization from the Qasawirka deposits at Waywaka, since no material from those levels was available for later flotation (see Appendix). One specimen was, however, recovered in the screens during the excavations. It consisted of two halves of a pealike seed (8.0 × 7.2 mm.), which lacked the channels or undulations on the interior split face that are characteristic of peanuts (fig. 99). This seed, resembling a field-pea, was recovered from Unit E 75 S 5, level IX east, on the northeastern slope of Waywaka, next to the road cut bordering the site. The seed was in a sandy floor stratum associated with a stone wall cut into pure Qasawirka refuse and covered by destruction debris and slope wash containing mixtures of post-Middle Horizon styles.

While it is perfectly reasonable to assume at least a continuation of the crops cultivated in the Initial Period, there is also indirect evidence of continuity in the stone tool inventory. Although I discussed the presence of obsidian from several foreign sources in the Initial Period levels, the primary material for the manufacture of stone tools in all periods at the site is basalt, accounting for 95% of all stone tools and chipping debris. Obsidian and chalcedony comprise less than 3% of the total for all levels and periods. Despite this continuity in the relative proportions of lithic materials through time, however, the stratigraphic record suggests a shift in technology, at least by the Middle Horizon and possibly by the Early Intermediate Period, from generalized flake tools to a focus on blade technology.

A total of eleven distinctive conical platform, turtle-backed cores were recovered from Qasawirka refuse. Four of these came from a stone feature resting on sterile bedrock under a ninety-centimeter-deep fill of mixed Qasawirka and later ceramics with no underlying Muyu Moqo refuse, suggesting an Early Intermediate Period date (Unit A; E 68 S 5). The other seven cores came from the mixed, but predominantly Qasawirka, fill of a stone-lined cistern, which was destroyed and filled sometime after Middle Horizon 1B times (Unit F, Structure 3). Although a number of basalt and chalcedony prismatic blades were recovered from the surface of Waywaka, only two examples were associated with Qasawirka refuse. While clearly struck from prepared cores such as those just mentioned, the paucity of blades in relation to cores recovered suggests that these cutting tools, while probably being produced at the site, were being used and discarded elsewhere. The surface examples, which cannot be dated, were distinguished by silica gloss along one edge and edge retouching along the other, presumably for hafting to a sickle or similar cutting tool. This shift to a blade technology suggests a parallel shift of emphasis from hunting activities to grain crops in the

Early Intermediate Period and definitely by Epoch 1B of the Middle Horizon in Andahuaylas.

The data from Waywaka and several other pre-Huari sites lead to the following conclusions. The shift to a clear reliance on camelids shown by the Qasawirka remains was probably well under way by the beginning of the Early Horizon in the Peruvian sierra.[5] Moreover, the evidence from Waywaka clearly suggests that this long term shift culminated in a broad based economy of highly diversified and interdependent, mixed agro-pastoral communities at least by the Early Intermediate Period in the Andean highlands.

Modern Andean Economic Analogs

The economic and demographic transformations inferred from the archaeological evidence appear to reflect the emergence of a pattern of intensive and diversified resource utilization now generally referred to as "verticality" or vertical zonation. This concept was initially formulated by John Murra on the basis Spanish colonial accounts of the Lupaca and Chupachu. While the high altitude homelands of these groups meant that their local economies were based primarily on tubers and camelid products, these groups had access to and control of a great variety of products from many different regions. It is the means of access to these foreign products that makes Murra's model of verticality unique. He suggested that, instead of depending on trade with foreign groups or seasonal and regional markets to obtain externally available goods, the Lupaca and Chupachu acquired these foreign products and community self-sufficiency through the maintenance in distinct environmental zones of small colonies that could supply the home population with nonlocal products on a regular basis, colonies that were located as much as four to six days' travel from the home populations (Murra, 1972).

However, the maintenance of economic self-sufficiency through the exploitation of diversified environmental zones may be manifest in other ways. Since Murra's initial formulation, ethnographers and archaeologists working in the Andes have addressed two key issues. First, to what extent do and did vertical economies operate within the context of smaller ethnic groups? Second, since Murra's model was based on data from the Colonial Period, what evidence is there for the antiquity of vertical zonation in the culture history of ancient Peru?

Over the past ten years anthropologists have repeatedly documented this environmental and economic pattern in different communities in a range of intermontane highland valley contexts throughout Peru and under a variety of situations reflecting different levels of isolation and integration with the Spanish-based mestizo culture. Three such communities are Q'ero, studied by Núñez del Prado and Webster as well as the geographer Mario Escobar; Uchucmarca, studied by Brush; and Chaupiwaranga, studied by Fonseca. Like Andahuaylas, all three ethnographic analogs represent communities in steep environments with multiple adjacent and accessible production zones at their disposal. Studies such as those in these three areas make it clear that the economic patterns identified earlier are not only still operating but widespread in Peru today. As Brush has observed:

> In spite of the tremendous upheaval caused by the Spanish conquest, the patterns of vertical control which Murra analyzed for the Andean highlands at the time of the conquest have analogous patterns that operate today. The actual operation of the system of economic

> zonation or verticality depends in part on the particular landscape within which it functions. In some communities with steep environmental gradients, the system can operate without markets and through a system of community control and reciprocity. In other areas of the Andes, where the environmental gradient is less steep, it operates with long migrations and market systems. (Brush, 1976b, p. 165)

Brush defined three types of zonation reflecting the diversity of highland environments, economies, and social systems operating in Peru today: the compressed type, the archipelago type, and the extended type (Brush, 1976b, p. 165). The extended type, which involves trade and market mechanisms, appears to reflect the loss of formally controlled production zones. The archipelago type uses colonies to provide access to distant products, as in Murra's historical examples. It is the compressed type of vertical zonation, with adjacent production zones, that is pertinent to the present and ancient situation in Andahuaylas.

In spite of the diversity in modern vertical economies, the indigenous Andean strategy represents a series of common approaches or adaptations to the Andean environment.

1. Location of community residences, often multiple, to provide equal access to all major crop zones exploited by the inhabitants in order to limit the effort needed in the constant care of scattered fields and pasture land.

2. Development of a mixed agro-pastoral system that exploits a wide range of microclimates to provide self-sufficiency in needed calories and proteins and precludes or limits the necessity of relying on markets or long distance exchange to supply its needs (Brush 1976a; 1977a, pp. 155-156; Webster, 1971).

3. Avoidance of food shortages by planting numerous crop varieties in each production zone, permitting continuous cross-pollination within a broad genetic base, as a safeguard against total crop loss from any one pest, plant disease, or episode of severe frost (Brush, 1977a).

4. Use of a series of agricultural strategies against disease, soil depletion, and low nutrient levels through a system of crop rotation, fallowing, and and the use of fertilizer (Brush, 1977b, pp. 39-40; Orlove, 1977b; Fonseca Martel, 1972; Núñez del Prado, 1968).

With the exception of the earlier work of Oscar Núñez del Prado (1968) and Mario Escobar Moscoso (1958), only recently have Andean studies shown how indigenous peoples manifest the economic principle of vertical zonation within the context of a single self-contained and self-sufficient ethnic community. For the southern Andes, one study in particular stands out for its utility as an analog to the archaeological record of Waywaka. This community comprises a group of hamlets collectively referred to as Q'ero, located in the province of Paucartambo in the eastern part of the department of Cuzco. Fieldwork begun in 1955 by Núñez del Prado and Escobar and in 1970 and 1971 by Webster has provided a detailed account of how the people of Q'ero operate a vertical economy.[6]

Unlike most highland groups, the Q'ero have been able to maintain control over and access to a highly diversified territory. Their lands stretch over 35 km. of the eastern Andean slopes and range in altitude from 1800 m. in the tropical montaña to 4700 m. in the high puna. Between these extremes the Q'ero engage in a highly diversified economy, which intensely exploits the production potentials of a wide range of environmental zones, characterized by the three modern staples of high altitude Andean economy: temperate crops in the lower zone, Andean tubers on the intermediate slopes, and camelids in the uppermost environs (Núñez del Prado, 1968, pp. 243-246; Webster, 1971). Within these zones an immense variety of animal and plant products is exploited. While estimates vary, the total inventory can safely be placed between 80 and 130 cultigens. From these different resources the people of Q'ero are able to meet all their subsistence needs and, as a result, remain almost totally independent of the external market economy of modern Peru.

Studies of the Q'ero and other highland pastoralists also provide data on the altitudinal and dietary needs of llamas and alpacas that are pertinent to the archaeological remains at Waywaka. Llamas can thrive on a variety of sedges and grasses found over a wide range of the puna region. They prefer the upper pastures but can do well as low as 3600 m. during the wet season (Orlove, 1977b). The alpace, however, is much more circumscribed in its range and depends upon a particular kind of alpine moor (known as *waylla*) for health and fine fiber production. These *waylla* moors occur naturally only in limited areas of the uppermost puna region, generally near glaciers or permanent snow, and "where these *waylla* are not present in sufficient quantity, alpaca cannot be raised" (Webster, 1972, p. 98). The amount of available pasture can be increased artificially in areas of increased moisture called "bofedales" (Orlove, 1977a; 1977b). The importance of the use of irrigation by highland pastoralists to maintain and increase dry season camelid pasture land in the puna zone above 4200 m. has been firmly documented by Félix Palacios in his study of the Aymara community of Chichillapi in Puno, Peru (Palacios Ríos, 1977). To overcome the restricted availability of dampness-loving *orqo* forage during the dry season (May-October), the inhabitants of this community maintain a network of over 30 km. of canals, which produce in excess of 2200 ha. of man made pasture land.

A further environmental constraint on camelid pastoralism is suggested by Terborgh's data on the decline of insects above 3600 m. (Terborgh, 1977). Insects and mites are a major source of infestation and disease in llama and alpaca herds required to travel below 3600 m., and a major reason for the poor domestication records in lower and warmer climates outside the southern Andes (Flores Ochoa, 1968; Gade, 1969).

It is also clear that, despite the ability of llamas to thrive at lower elevations than alpacas, this capacity is seasonal. Seasonal changes also affect the timing and location of births and deaths in the llama herds. In the Sicuani region, south of Andahuaylas, Orlove recorded that the birth of young camelids coincides with the advent of the rainy season, when lower elevation "pastures for the lactating mothers are plentiful and the risk of exposing the neonates to frost is low" (Orlove, 1977b, p. 85). The selective butchering of old or diseased llamas also takes place at the lower elevations towards the end of the rainy season, prior to taking the herds up to the harsher higher elevations and the more restricted dry season pastures (Orlove, 1977b, p. 86).

It appears, then that deaths of newborn llamas and the selective butchering of weaker animals are today seasonally specific, low elevation events. These modern patterns suggest that the killing of animals for meat and sacrifice may also have been seasonal activities at the time of the Qasawirka occupation in Andahuaylas and, thus, would have occurred relatively close to the primary ridgetop settlements. Even though the lower limits of the wet season pastures and herding activities are still considerably higher than the elevations of these settlements, they are, nonetheless, much closer than the upper pasture lands, which are 5-10 km. away.

One of the most important insights provided by ethnographic data is the degree to which the three production zones, while highly diversified and widely spaced, are also tightly integrated and, in fact, essentially interdependent. This interdependence is mandated by the central role played by the archaeologically visible camelids in facilitating production in the two lower agricultural zones of grain and tuber production.

First, efficient and maximum production of maize and tuber plots depends on the ability to move large quantities of equipment, seed, and fertilizer up and down the slopes almost continually. Each variety of the large number of diversified cultigens has particular daily and seasonal requirements. So, instead of being able to spend long periods of time in one particular zone, the Q'ero farmer must be constantly moving between his different zones. Charts by Núñez del Prado and Webster of a farmer's daily activity within his territory look like a wildly fluctuating trace on an oscilloscope screen. While most agricultural work focused close to the primary settlement at 3200 m., the Q'ero worked for periods of a week or more on 9 different occasions over 11 months in the *jalka* uplands above 4000 m., and for 5 periods of 1-4 weeks each in their lower *kichwa* fields at 1800 m. (Núñez del Prado, 1968, pp. 255-256). Webster estimated that each year 20% of their effort was taken up by movement and transportation of tools, fertilizer, and crops (Webster, 1971; 1973). Moreover, Thomas' measurements of energy in kilocalories of work expended on different agricultural activities in the Puno region documents that the transport of dung, seed, and harvested potato, quinoa, and cañihua between and within the different vertical production zones, alone amounted to 30% of all economic effort each year (Thomas, 1973, pp. 77-79). Similarly, in the community of Uchucmarca in the Marañon River drainage, Brush recorded that the "average farmer spends almost 60 percent of his work time tending his fields and herds. . . . Hiking to and from cultivated plots may occupy several hours per day" (Brush, 1977b, p. 39). The ability of the Q'ero and other highland agro-pastoralists to meet this tight agricultural schedule depends on the use of large numbers of male llamas to transport the fertilizer, seed, and tools up and down the slopes (Núñez del Prado, 1968, pp. 255-256).

Second, large numbers of camelids are also essential for high tuber yields. To preserve the relatively weak soils of the tuber plots, the highland farmers depend not only on a community system of rotation and fallowing but also on the use of large quantities of camelid dung for fertilizer. Each dry season they collect and store the piles of dung, conveniently deposited in localized parts of the upper pasture lands, and then use it to fertilize their crops (Webster, 1971; 1973; Winterhalder, Larsen, and Thomas, 1974). In another technique, used to fertilize future maize plots in the southern Peruvian altiplano of the Collao, the animals are simply corraled in the prospective corn field for some four to ten nights prior to the February planting (Castillo López, 1978, p. 175).

While it has been argued that camelid fertilizer is essential for tuber production (Webster, 1971; Winterhalder, Larsen, and Thomas, 1974), available evidence suggests that the two grains, quinoa and cañihua, may also require the artificial soil-improving qualities of camelid dung in order to provide maximum yields. Orlove (1977a) and others have observed how cañihua sports a dynamic stand of plants the first year after the potatoes are harvested (while the nutrients from the dung applied the previous year are still available). Both cañihua and quinoa require adequate levels of nitrogen and phosphorous (Edwards, 1981b). Without both, these grain plants show minimal growth and produce small, weak, yellowed plants (León, 1964, p. 77). However, soil tests by Winterhalder, Larsen, and Thomas show that highland Andean intermontane soils tend to be weak in both elements. The application of dung raised the level of available phosphorous by a factor of 2.6 in the valley bottom *kichwa* fields and by upwards of 4.5 in the unirrigated *jalka* potato and cañihua fields; nitrogen was raised by a factor of 3.9 or almost 400%, for both (Winterhalder, Larsen, and Thomas, 1974, p. 96).

In addition to supplying these basic nutrients, dung facilitates healthy grain growth in another way, which may be even more critical. Andean soils appear to be consistently acidic without fertilization. Where measurements are available from the Winterhalder field tests, the application of dung as fertilizer causes a sharp increase in pH, from low and acidic levels of 5.1 in unfertilized fields in both zones, to more neutral levels of 6.8 in the valley soils and 6.3 in the *jalka* potato fields. Because pH is a logarithmic function, this shift represents increments of several hundredfold in the relative availability of basic OH ions (Winterhalder, Larsen, and Thomas, 1974, p. 96).

While it has been generally understood that amaranths and chenopods thrive in disturbed and basic soils (Peterson and McKenny, 1968), it is now becoming apparent that the level of soil acidity also plays a direct role in the availability of essential plant nutrients as well as of poisonous trace elements that would affect the viability of both chenopods and legumes in the predominantly acidic soils common to highland Peru. While tubers do well in acidic soils with pH levels as low as 5.5, legumes and grains do not. Without adequate levels of OH ions, at pH levels below 5.2 the trace element aluminum becomes soluble and is not only toxic but also bonds with the essential nutrient phosphorous, making it unavailable for plant growth. Moreover, legumes, such as the common bean recovered from Muyu Moqo C-D refuse, are unable to fix essential nitrogen in acidic soils. Molybdenum, an essential trace element also unavailable in acidic soils, is also required by legumes to produce an essential enzyme necessary for nitrogen fixation. Thus, the addition of dung as fertilizer to Andean soils not only adds nutrients but, by increasing pH to more basic levels of 6.5 and above, helps limit the presence of toxic trace elements such as aluminum, thereby permitting release of phosphorous and the accumulation of higher nitrogen levels by legumes (personal communication, Dr. William Liebhart, Rodale Research Center, 1982). Consequently, it is apparent that the application of camelid dung, in addition to facilitating high potato yields, may have affected the production potentials of legumes and chenopods as well.

Thus it becomes clear that, while each altitude zone could produce specific staples independently, the achievement of maximum production requires the coordinated interchange of resources between adjoining zones (Orlove, 1977b; Brush, 1976a). So the control of large numbers of camelids to provide dung and as beasts of burden emerges as a key integrating factor necessary to maximize production and product diversity within the community. While other students of Andean culture have stressed the role of llama trains in the supply of armies (Murra, 1965), and for long-distance trade (Browman, 1975), we have here a quite different function. It should now be clear that llamas, in addition to providing interzonal transportation of dung, seed, and harvested products, are also essential for intensive cultivation, maximal yields, and economic self-sufficiency within the territorial limits of a single small ethnic group. The high density of camelid remains in the Qasawirka refuse suggests that both transport and essential fertilizer were readily available to enhance the grain and tuber yields of Andahuaylas at least by the Early Intermediate Period.

Conclusions

The excavations carried out at the site of Waywaka have contributed materially to our knowledge of Andean culture history. The first settlement there, identified by Muyu Moqo Phase A ceramics, contains one of the earliest occurrences so far known of the Andean neckless olla tradition, suggesting that this tradition may have been based in the south central highlands rather than the coastal areas of Peru where it was first identified. Multiple lines of evidence suggest that the Muyu Moqo peoples were exploiting key elements of the distinctive high altitude Andean food complex of grains, beans, and, presumably, tubers during the second millennium B.C. Moreover, despite the small size of the settlement and economic indicators of a mixed hunting and agricultural food base throughout the Muyu Moqo occupation, there are strong reasons to believe that these people were engaged in multiple, long-distance networks of foreign commodity and idea exchange long before the advent of the well known and widespread Early Horizon cultures. So that rather than being a time of regional isolation, with little or no interaction among the various ethnic groups, the Muyu Moqo material suggests that the Initial Period was a time when a widespread pool of commonly held ideas existed throughout the central and southern regions of Peru. The evidence also suggests that this apparently extensive and diverse long distance exchange and contact, direct or indirect, was taking place without any indications of "higher levels" of social organization, such as centrally planned settlements or any substantial, effort-intensive ceremonial or administrative structures. Finally, the earliest Muyu Moqo refuse levels provided the earliest evidence so far encountered for Andean metal technology, pushing it back perhaps as far as the beginning of the second millennium B.C., long before and far to the south of the elaborate and well known gold technologies of Colombia and Ecuador or even north coastal Peru.

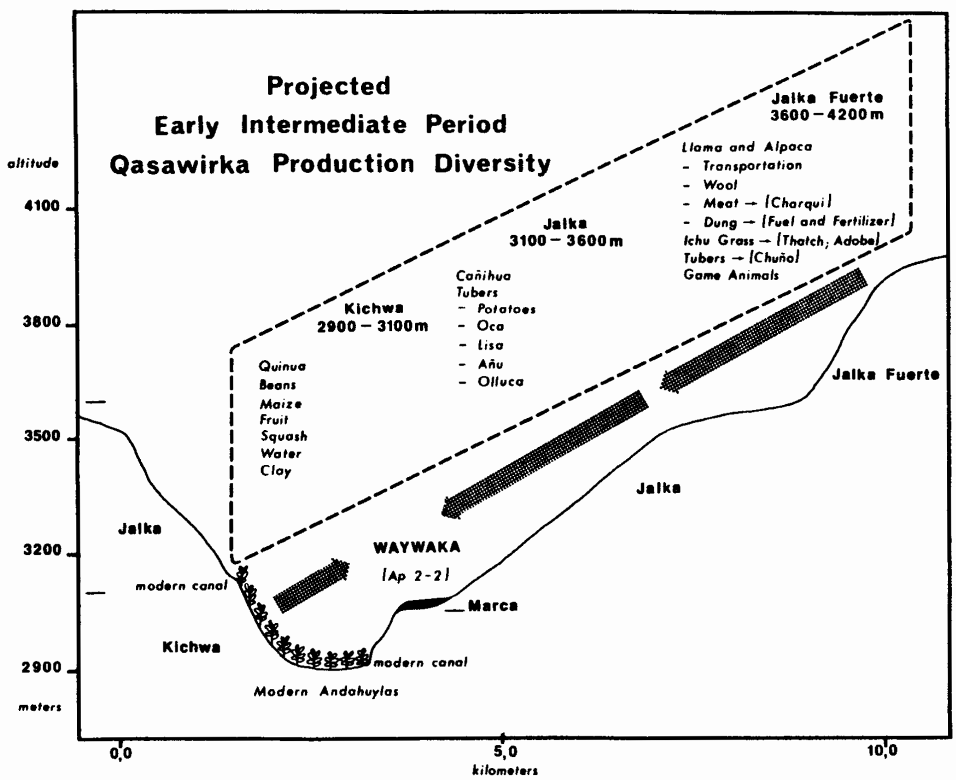
There is no clear evidence of an Early Horizon occupation at the site of Waywaka but, in the Early Intermediate Period, the site was reoccupied by people making a pottery style called Qasawirka, who remained there until after the arrival of Huari influence in Andahuaylas. The Qasawirka settlement contrasted sharply with the Muyu Moqo ones. The area occupied on the same ridge-top location was at least twenty times greater than that of the largest Muyu Moqo settlement at the site and there was also a massive increase in the number and density of camelid remains in the refuse. These transformations, together with the number and locations of other Qasawirka settlements, suggest that intensive exploitation of adjacent environmental zones was already under way and that the ideal of community control of the distinct *jalka* and *kichwa* economic zones was fully operative as the basis of economic strength and community self-sufficiency at least by the first centuries of the Christian era. Based on the role played by camelids as sources of fertilizer and transport essential for maximum production yields, I see the changes in the archaeological record as indicating that the peoples of Andahuaylas had the capacity to develop the economic potentials of their three adjacent production zones with an intensive and diversified mixed agro-pastoral economy at least by the Early Intermediate Period and possibly earlier.

We can now depict the Early Intermediate Period as a time of considerable population expansion in the Andahuaylas region, with numerous well established ridge-top villages or small towns surrounding the arable valley lands, with easy access to potato fields and grazing lands above. Unlike contemporary coastal cultures, whose depictions of head taking, warriors, and prisoners suggest warlike conditions, the Early Intermediate Period inhabitants of Andahuaylas did little to prepare themselves for conflict. They did not build forts or even defensive walls around their settlements. Indeed, all indications are that, rather than engaging in warlike pursuits, they were spending most of their energy in working out efficient economic strategies in an atmosphere of relative security.

In terms of the modern economic context of market and bilateral exchange between specialty producers from different locations, both phenomena appear to have been artifacts of external influence, first from the Incas and then the Europeans. What are now two distinct geographical and economic spheres in Andahuaylas, with Mestizos occupying the lower *kichwa* lands while the Runa occupy the puna lands above, appear in the past to have been under the integrated control of intermediately located settlements. There is little evidence that markets or bilateral exchange operated as central mechanisms in the economic strength of the Qasawirka settlements. In the entire Waywaka sequence, the evidence for long-distance exchange is most visible in the smaller Initial Period occupations. Not only do the exotic import items appear to drop out of the record by the Early Intermediate Period, but even obsidian seems to have been obtained from local sources.

All lines of evidence associated with the regionally localized Qasawirka ceramic style point to a nonmarket economy based on internal group control of a diversified range of crops and production zones (Diagram 1). The data suggest that this regional self-sufficiency came about after a long series of local developments in both population and production capabilities without and before any evidence of influence from the Huari empire. The local economic system may have been affected or absorbed by the Huari expansion but it does not seem to have resulted from the influences of a powerful state such as Huari (Grossman,

Diagram 1



ms.a; compare Browman, 1974, p. 195). Indeed, while Huari influence is evident late in the sequence at Waywaka, it is quite possible that the impact of Huari resulted in a simple reorganization of the already established Qasawirka communities without much traumatic movement or decline in the local population. Perhaps the Huari administrators or settlers were concerned only with tapping the considerable economic reserves available in the region. If so, the evidence so far does not permit us to specify whether they did this through conquest or alliance.

The archaeological record is clear on another point, however. While the Qasawirka and Huari peoples may have lived together with local traditions intact for at least a short while, this situation did not continue for very long. Following the appearance of Huari style pottery in Andahuaylas, there was a drastic alteration in the direction of ceramic development that was never reversed. With Huari came significant new ceramic techniques and cannons of style that dominated the subsequent ceramic developments until the appearance of Inca influence. It is also clear that Late Intermediate Period settlements did not present a return to an older way of life. Numerous truly defensible fortress and mountain top redoubts appeared. The peaceful situation apparent during the Early Intermediate Period disappeared, and both the archaeological and historical records show the Late Intermediate Period to have been truly a time of conflict.

Acknowledgements

It is appropriate that this study appear in this commemorative volume. John H. Rowe initiated controlled archaeological work in Andahuaylas in 1954 and subsequently gave me the opportunity, incentive, and direction needed to carry out research there. In my work I was able to combine the skills of ceramic and stylistic analysis that I learned at Berkeley with the used of controlled excavation by natural stratigraphic levels to continue unravelling the culture history of Andahuaylas.

The research upon which this study is based was sponsored primarily by the Comisión Fulbright de Intercambio Educativo del Perú, in Lima. A supplementary Dissertation Grant, critical to the work, was supplied by the National Science Foundation (GS-3085). Excavation was undertaken under the direction and according to the requirements of the Patronato Nacional de Arqueología, now the Comisión Técnica Calificadora of the Instituto Nacional de Cultura, under the terms of Resolución Suprema 465. All analysis and illustration of the artifacts was completed in Peru and the collections are now stored with the Instituto Nacional de Cultura, Filial Cuzco.

Portions of the argument set forth here were originally presented at various conferences between 1972 and 1976, and its present form reflects the advice, criticism, and discussions that resulted. I would particularly like to thank the extra efforts and insights devoted to earlier drafts by the following colleagues: William Mitchell, Thomas Dillehay, John Rowe, Patricia Lyon, and Karen Bruhns. With the exception of the ceramic profiles, all graphics were rendered by Melissa Apperstein. The micro-photographs of seeds were taken by Victor Calderola.

APPENDIX

A decade after the original excavations, a large ash-filled radiocarbon sample was rejected for analysis. Microrecovery water flotation techniques were applied to this sample resulting in the recovery of four seed varieties. The sample, hence the seeds, came from a white ash lens that formed the interface between Muyu Moqo Phase B and Phase C-D strata. This stratigraphic placement indicates that the preserved seeds predate the final phase of the Muyu Moqo style.

None of these carbonized seed remains is yet positively identified by experts but tentative identifications suggest the presence of amaranth and two forms of chenopod as well as a fourth variety that is not yet identified even tentatively. The difficulty of identification reflects the lack of work in the general region, the lack of readily available comparative specimens of the often minute seed forms from otherwise recognized plants, the often poor published reproductions of specimens of indigenous highland plant seeds, ambiguities in the morphological criteria of the seed identification, contrasts and changes in seed form resulting from differences in fruiting behavior, and alterations in form from being charred.

Specifically, Andean amaranth seeds are so small that they have only recently been documented at a diagnostic morphological level with a scanning electron microscope (Irving, Betschart, and Saunders, 1981). Precisely because of its small size it is often difficult to distinguish from other species of wild chenopod and amaranth, especially when it is charred and fragmentary. In contrast, the two common Andean chenopods, *Chenopodium quinoa* and *C. pallidicaule* are distinguished in shape and size as well as by different fruiting characteristics. The larger quinoa seeds measure around 2 mm. in diameter, have a depressed equatorial band, and at maturity the outer skin, or pericarp, splits and shrivels to expose the ripe quinoa seed for easy harvesting. The smaller cañihua seed, however, which measures between 0.8 and 1.0 mm. in diameter, does not shed its seed covering and ripens for harvest with the pericarp often cracked but still in place, as a wrinkled and ridged covering (Simmonds, 1965, p. 224). This means that, when charred, quinoa seeds may be preserved as exposed grains and cañihua seeds either as exposed grains or as seeds with the cracked pericarp still in place. The identification of these chenopods is further complicated by the effects of heat. Quinoa tends to puff up and lengthen in shape when parched, a transformation that makes botanical identification difficult if not impossible (Pearsall, 1980, p. 198).

Bearing in mind these reservations and ambiguities, the four small seeds that were recovered are here designated only as numbered seed types. Each type has been tentatively identified by comparison with available materials and is reproduced in a large scale photograph for future comparison.

Seed Type 1 (fig. 89)

Small fragmentary specimen (0.3 × 0.5 mm.), oval in shape with pronounced lateral ridge, tentatively identified by staff of the Rodale Research Center as a possible variety of *Amaranthus*.

Seed Type 2 (fig. 90)

A small, teardrop-shaped seed (0.8 × 0.1 mm.) with a pronounced lateral ridge along its length, with the pericarp cracked but still covering the seed. This specimen suggests in its size, form, and preserved covering, the parched remains of *Chenopodium pallidicaule* (?), or cañihua.

Seed Type 3 (fig. 91)

A larger, smooth oval form (2.9 × 3.2 mm.) with a lateral ridge and small, bulblike elongations at the more pointed end, suggesting heat-altered "puffed" examples of *Chenopodium quinoa* (?) resulting from parching (see Pearsall, 1980, p. 198).

Seed Type 4 (fig. 92)

Two forms of a flat, oval, teardrop-shaped seed (1.8 × 1.5 mm.) with a slight nub at the more pointed end. Although similar in shape to larger squash seeds, their small size falls far below the cucurbit size range. This seed type has not yet been identified.

NOTES

[1]See also Marcos (1979) and Rowe (1967) for further discussion of the determinations from Hacha and the related Initial Period south coast site of Erizo.

[2]The Muyu Moqo faunal identifications used here and in Table 3 were made by Todd R. Olson, Department of Paleontology, University of California, Berkeley.

[3]I made the initial identifications in the field. After I left Peru, Dr. Jorge Sãnchez of the University of Cuzco kindly reviewed and refined my observations (note from Sãnchez to John H. Rowe, September 1972).

[4]Each of these graphic representations of change through time was rendered through a combination of the Valdocs Graphics software program on the Epson QX-10 computer and the Radio Shack Advanced Statistical Analysis Program for the TRS-80 computer.

[5]See Conklin (1979) for parallel shifts in the availability of camelid fiber, as seen in dated coastal textiles, during the Early Horizon.

[6]A volume has recently been published containing reprints of several of the early studies as well as some previously unpublished more recent works and a bibliography of studies on Q'ero (Flores Ochoa and Nũñez del Prado Bẽjar, 1984). (PJL)

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KEY TO ILLUSTRATIONS

Specimens are from the site of Waywaka (Ap2-2) unless otherwise specified. All photographs except figs. 88-91 and 99 are by the author.

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Figs. 8-9. Unit C VIII.
Figs. 10-11. Unit G IX.
Fig. 12. Unit C VIII.
Fig. 13. Unit G VIII.
Figs. 14-15. Unit G IX.
Fig. 16. Unit G VIII.
Fig. 17. Unit C VIII.
Fig. 18. Unit E VI.
Fig. 19. Unit C VIII.

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Fig. 20. Unit E V; 11.5 cm. diameter.
Fig. 21. Unit C VI.
Fig. 22. Unit E V.
Fig. 23. Unit E VI.
Figs. 24-25. Unit C VI.
Fig. 26. Unit C VII.

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Fig. 27. Unit G IV.
Fig. 28. Unit C IV.
Fig. 29. Unit C Va (upper half of stratum).
Fig. 30. Unit G IV; 24.7 cm. diameter.
Fig. 31. Unit C IV; 23.7 cm. diameter.
Fig. 32. Unit C Va (upper half of stratum); 22.5 cm. diameter.
Fig. 33. Unit C IV; 19.5 cm. diameter.

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Fig. 34. Unit E III.
Fig. 35. Unit G III.
Figs. 36-37. Unit C IV.
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Figs. 43-44. Unit D VII.
Fig. 45. Waywaka surface; Zanabria collection, Cuzco.

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Fig. 47. Colcapata (Ap2-26) surface.
Figs. 48-50. Qasawirka (Ap2-1) surface.
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Fig. 52. Unit F II-VII.

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Fig. 53. Recovered by a farmer at Qasawirka (Ap2-1); exterior covered with oxblood-colored slip.
Fig. 54. Qasawirka (Ap2-1) surface.
Fig. 55. Unit F III-VIII.
Fig. 56. Qasawirka (Ap2-1) surface.

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Fig. 70. Collected by Alejandro Barrientos Bustos while cultivating his fields at the site of Qasawirka (Ap2-1). Collection of the Colegio de Andahuaylas, Andahuaylas.

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Fig. 73. Unit E IV; weight 2.24 gm.; 29.0 mm. long, 13.5 wide, 6.2 thick.
Fig. 74. Unit G IV; weight 1.435 gm.; 21.5 mm. long, 15.5 wide, 5.5 thick.
Fig. 75. Unit G VII; weight 1.53 gm.; 25.0 mm. long, 16.0 wide, 6.0 thick.
Fig. 76. Unit G VII; weight 0.74 gm.; 17.0 mm. long, 13.0 wide, 4.5 thick.
Fig. 77. Unit G IX; weight 0.48 gm.; 19.0 mm. long, 14.0 wide, 4.0 thick.
Fig. 78. Unit C VIII; weight 1.38 gm.; 21.0 mm. long, 13.0 wide, 6.0 thick.
Fig. 79. Unit D VII; weight 1.385 gm.; 20.0 mm. long, 17.0 wide, 6.1 thick.

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Fig. 93. Unit E VII, mixed Muyu Moqo A and B refuse; white, sand-dwelling Pacific clam.
Fig. 94. Unit D VII, mixed Muyu Moqo A and B refuse.
Fig. 95. *Mytilus* sp., unit G VI, Muyu Moqo C-D refuse.

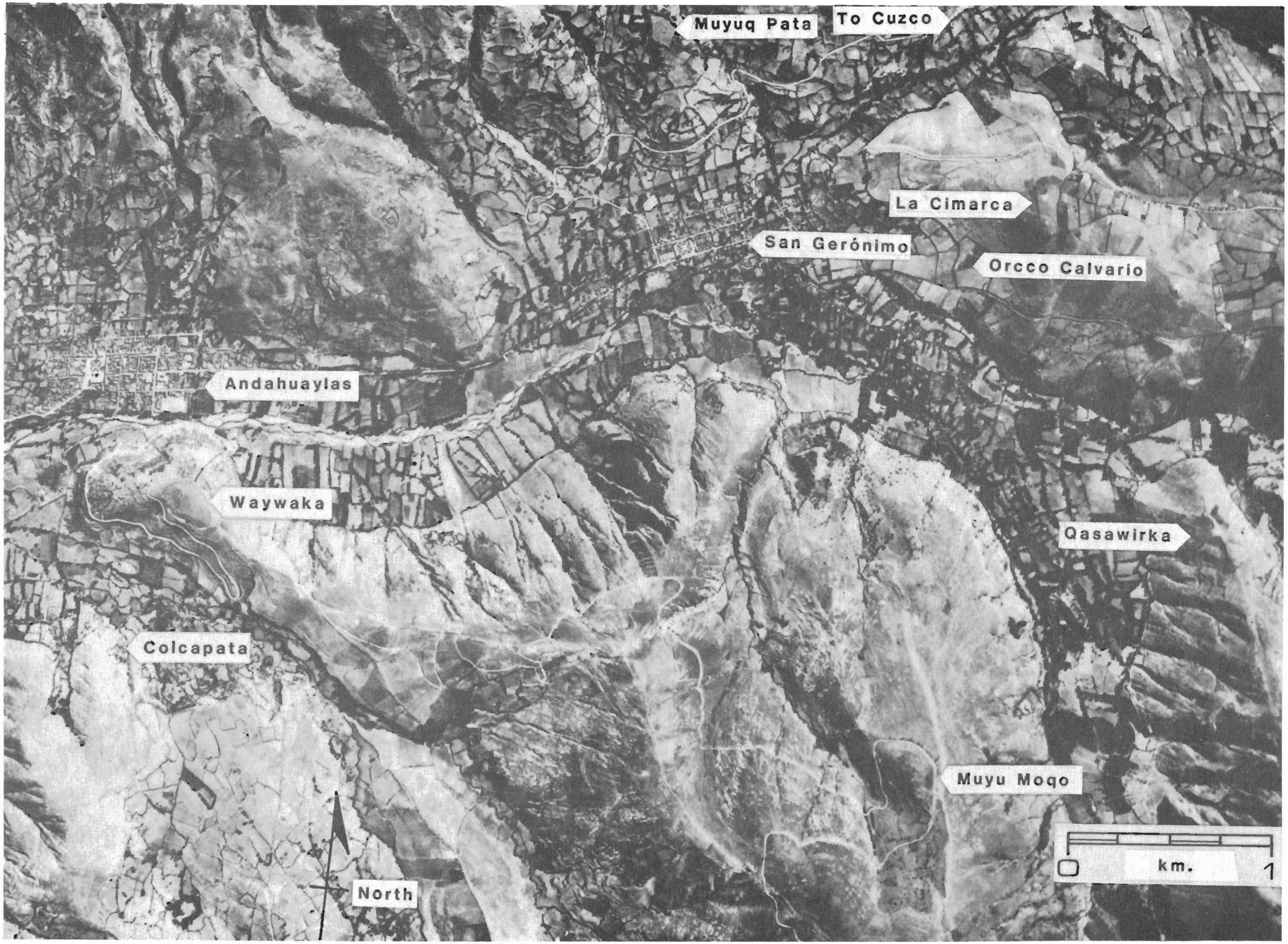


Fig. 1, aerial view, Chumbao Valley, Andahuaylas, Apurimac, Peru, showing ridge-top settlements surrounding the basin.

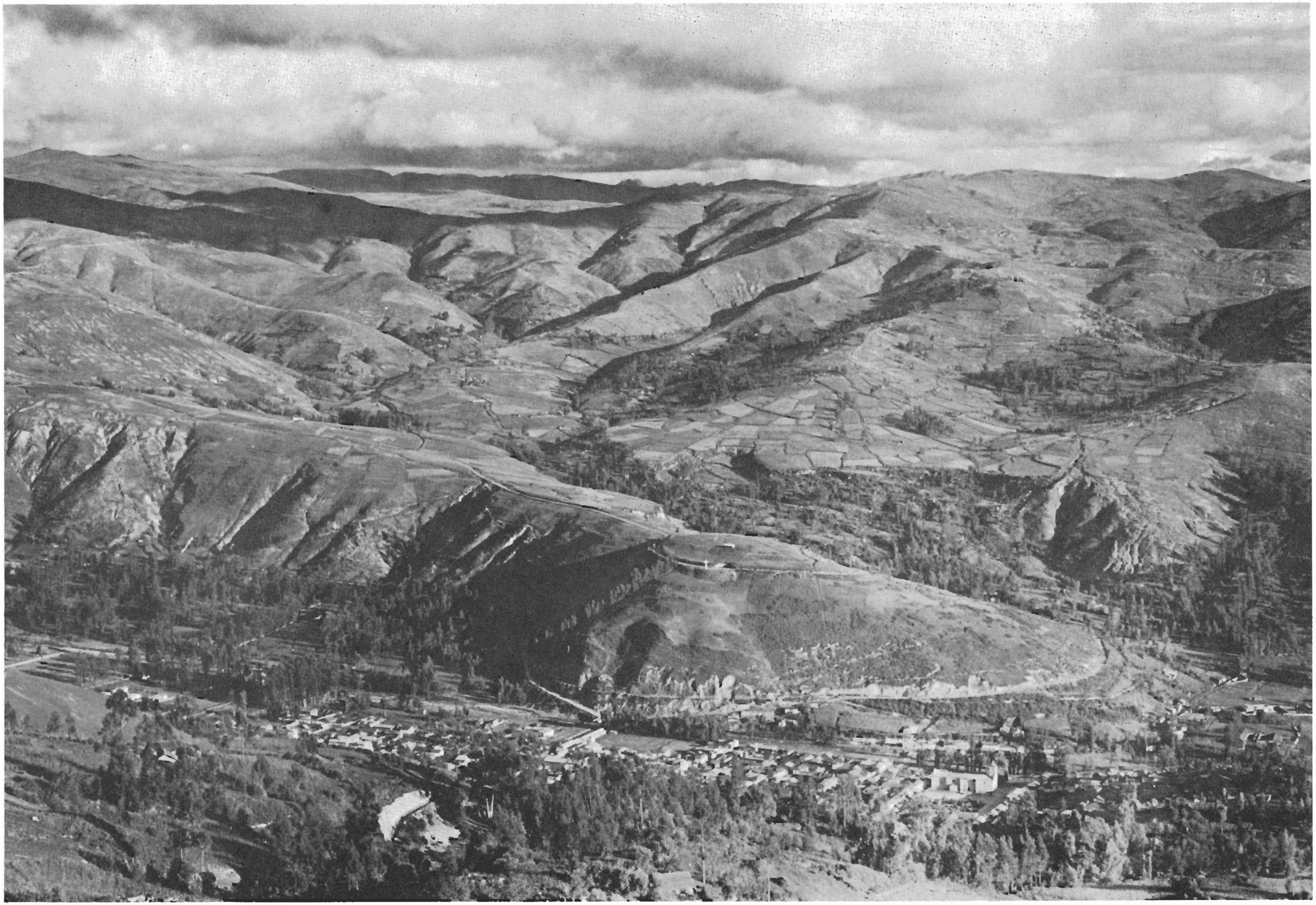


Fig. 2, the site of Waywaka (Ap2-2), located above the modern city of Andahuaylas. The zone of ancient occupation is essentially bounded by the road cut around the top of the hill.

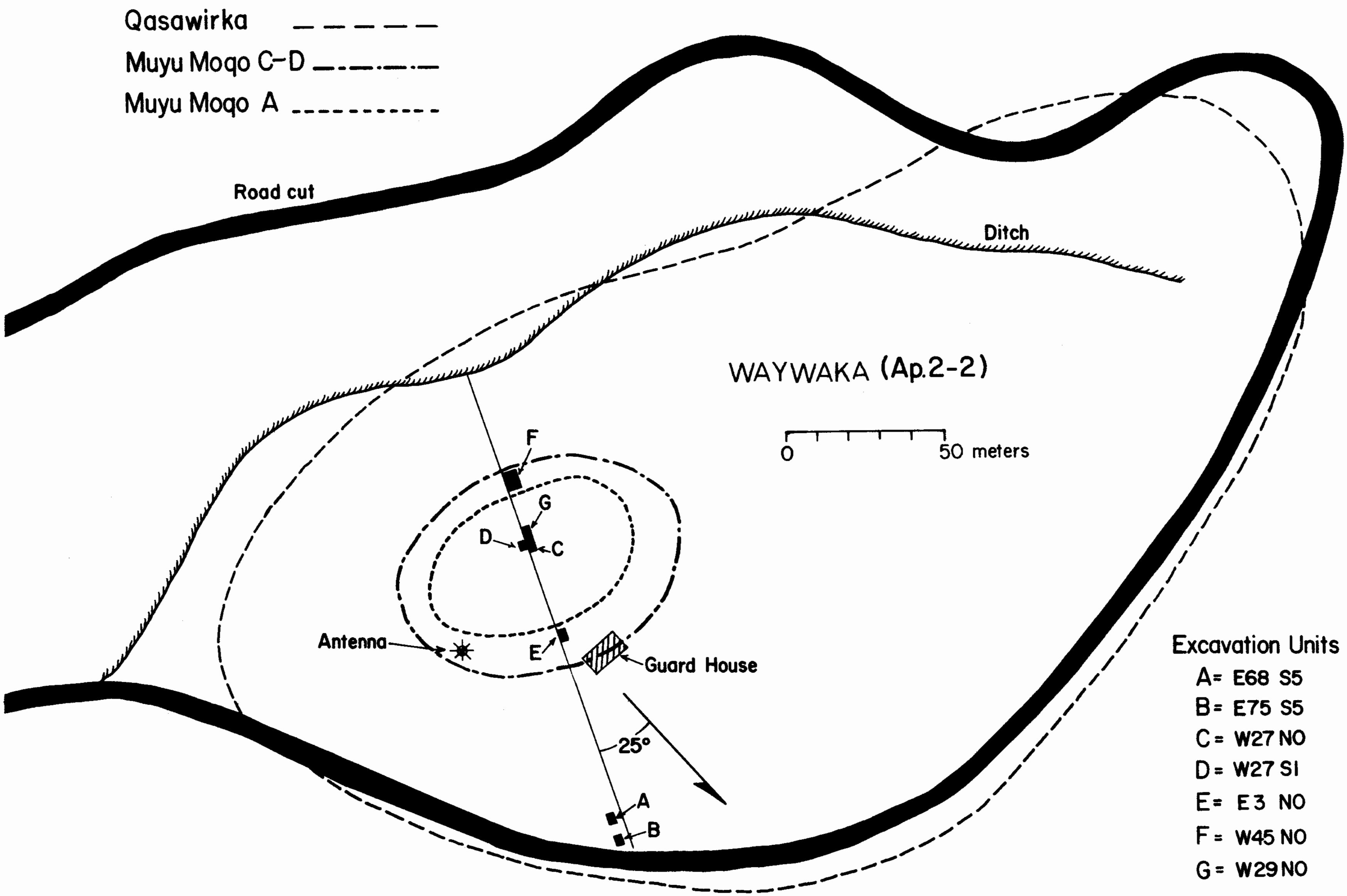


Fig. 3, plan view of Waywaka showing excavation units and projected increments of settlement size through time.

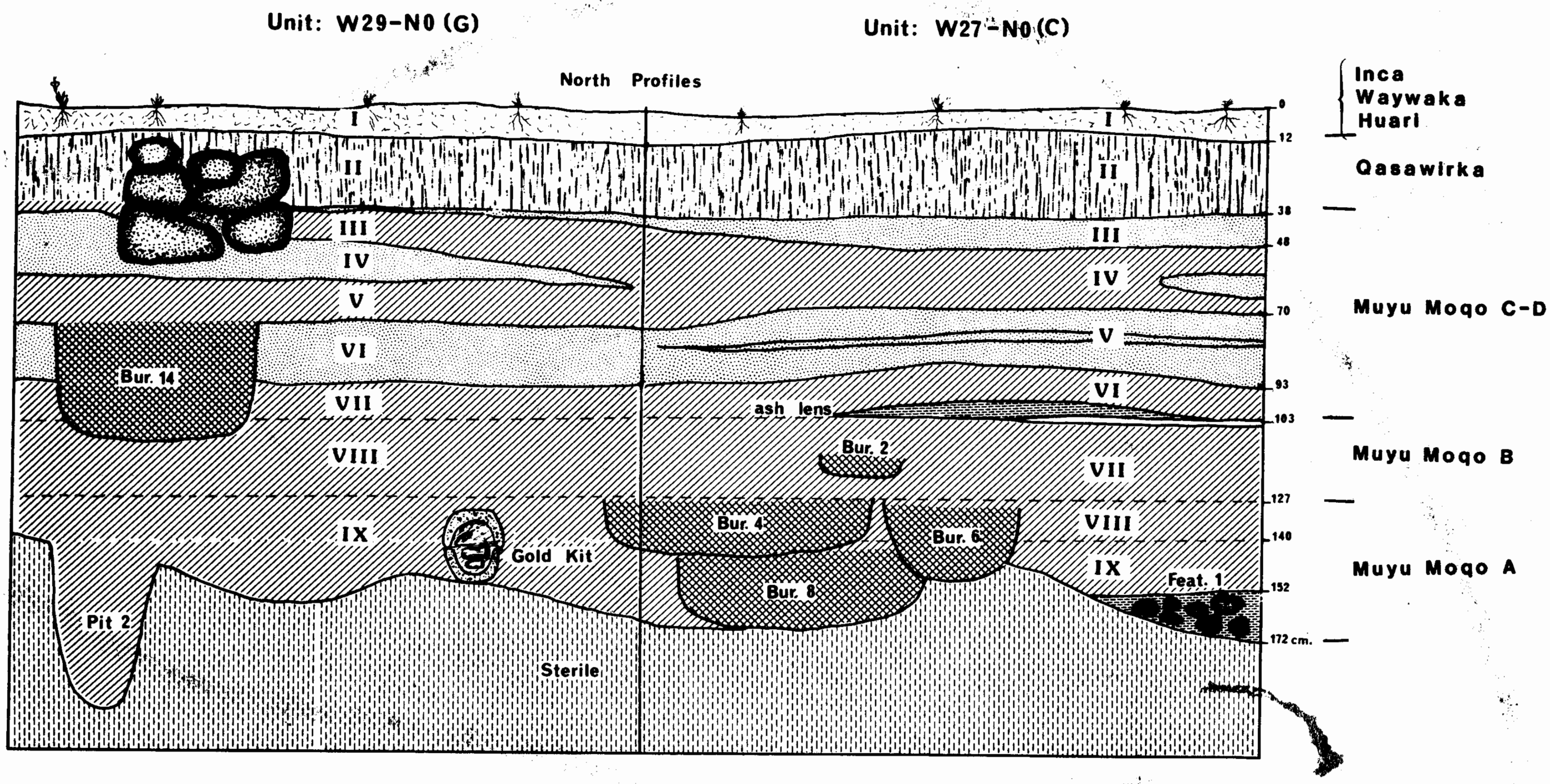


Fig. 4, stratigraphic profiles of excavation units on crest of Waywaka; ceramic sequence is on the right.

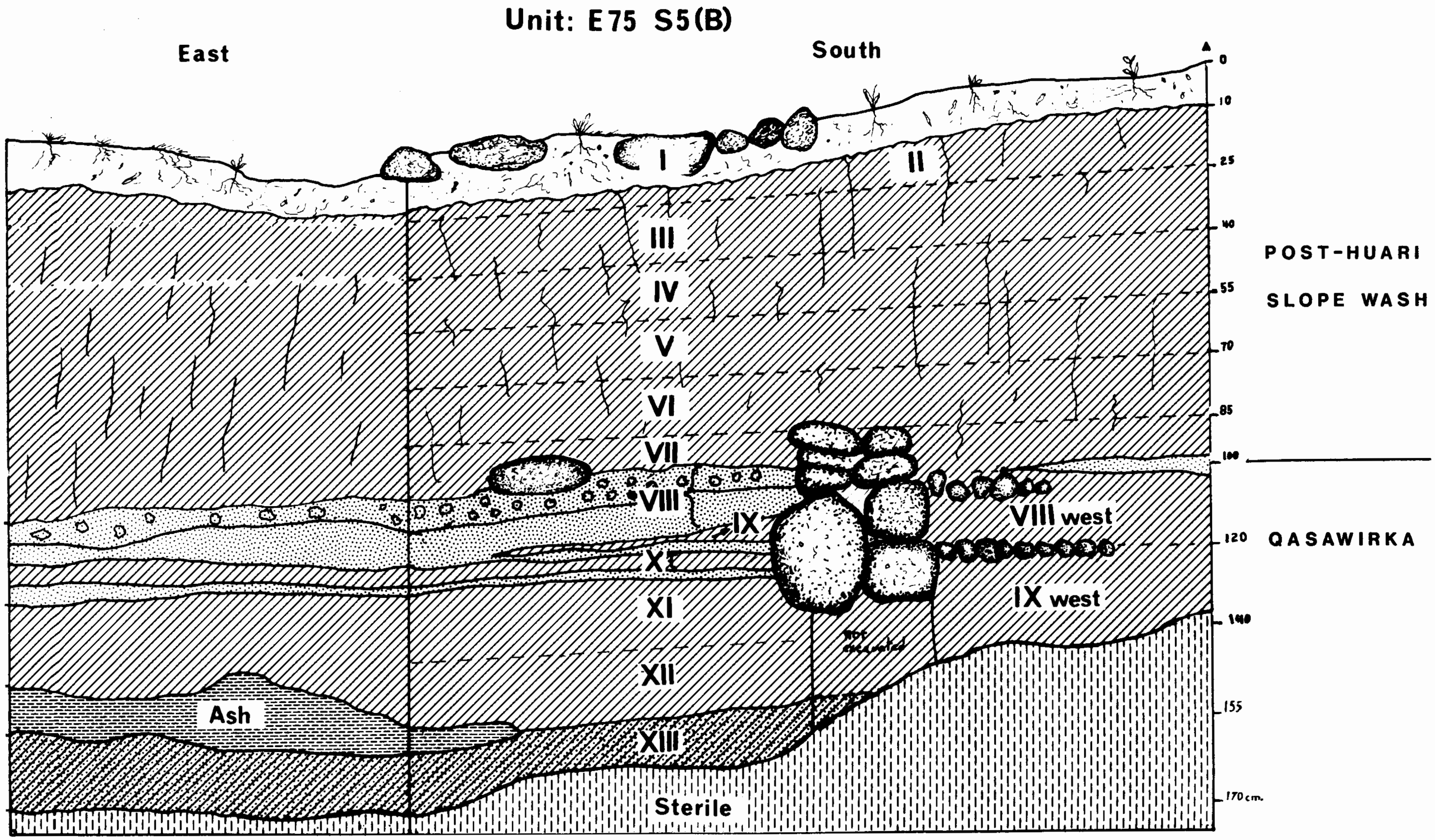
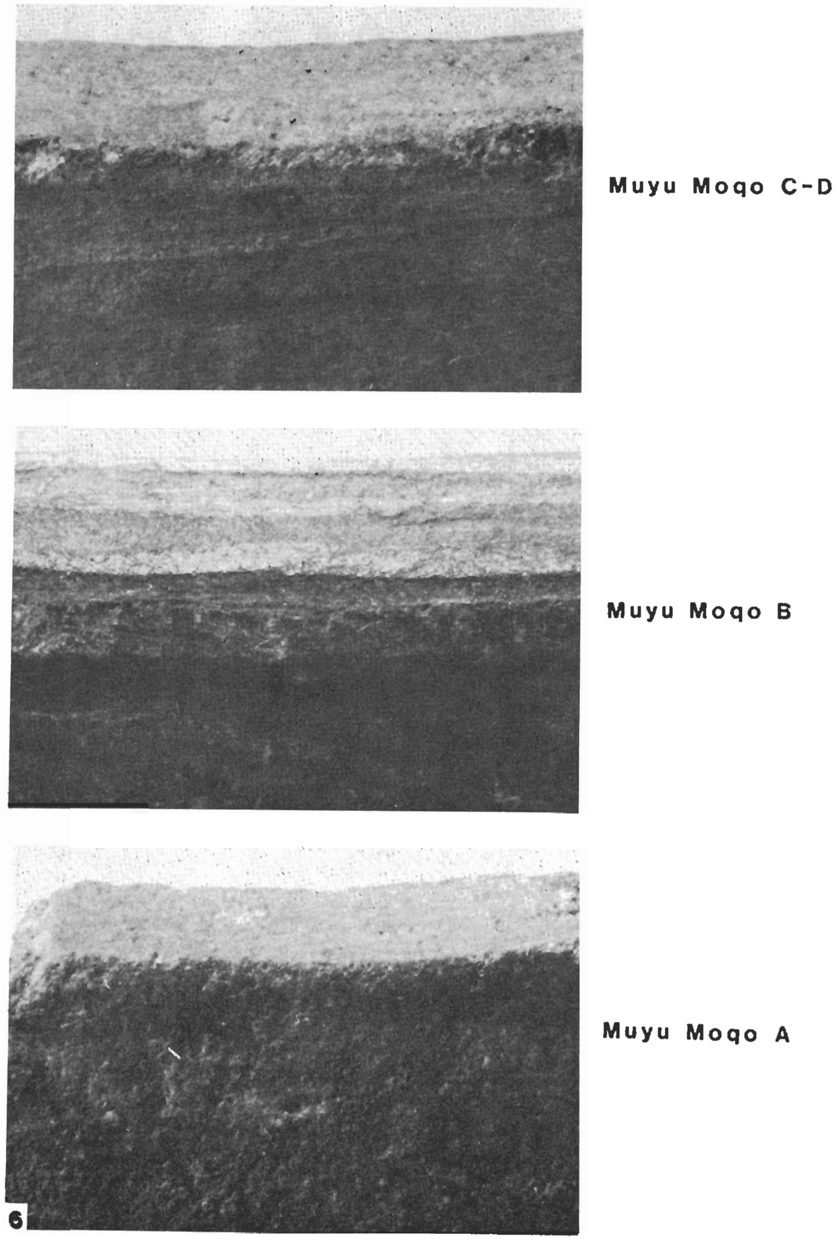


Fig. 5, profile of Unit B on northeastern edge of Waywaka showing living floors and primary deposits of Qasawirka refuse over bedrock and covered by thick deposit of post-Huari slope wash.



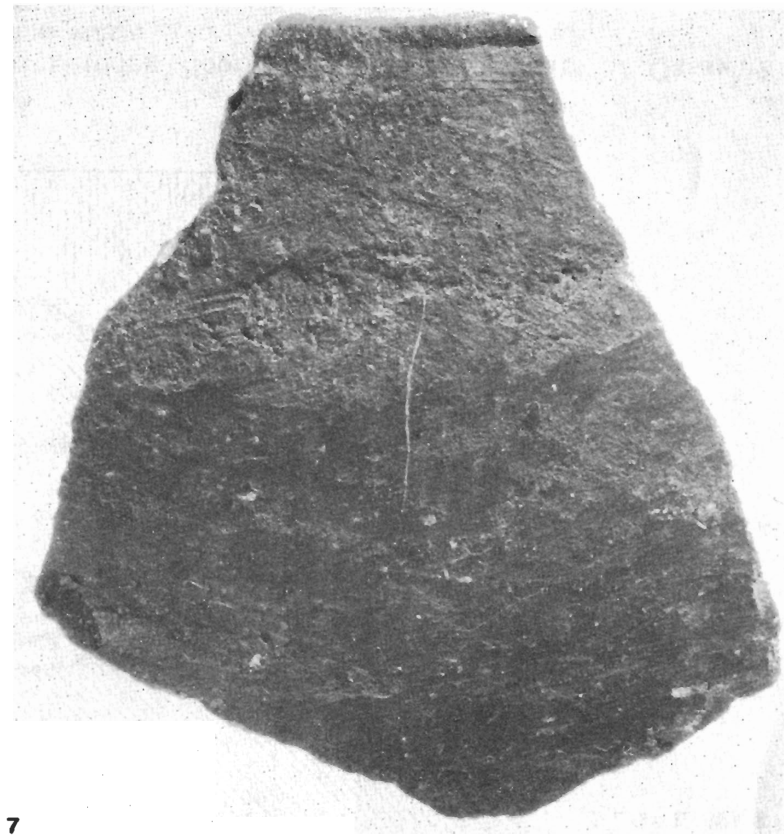
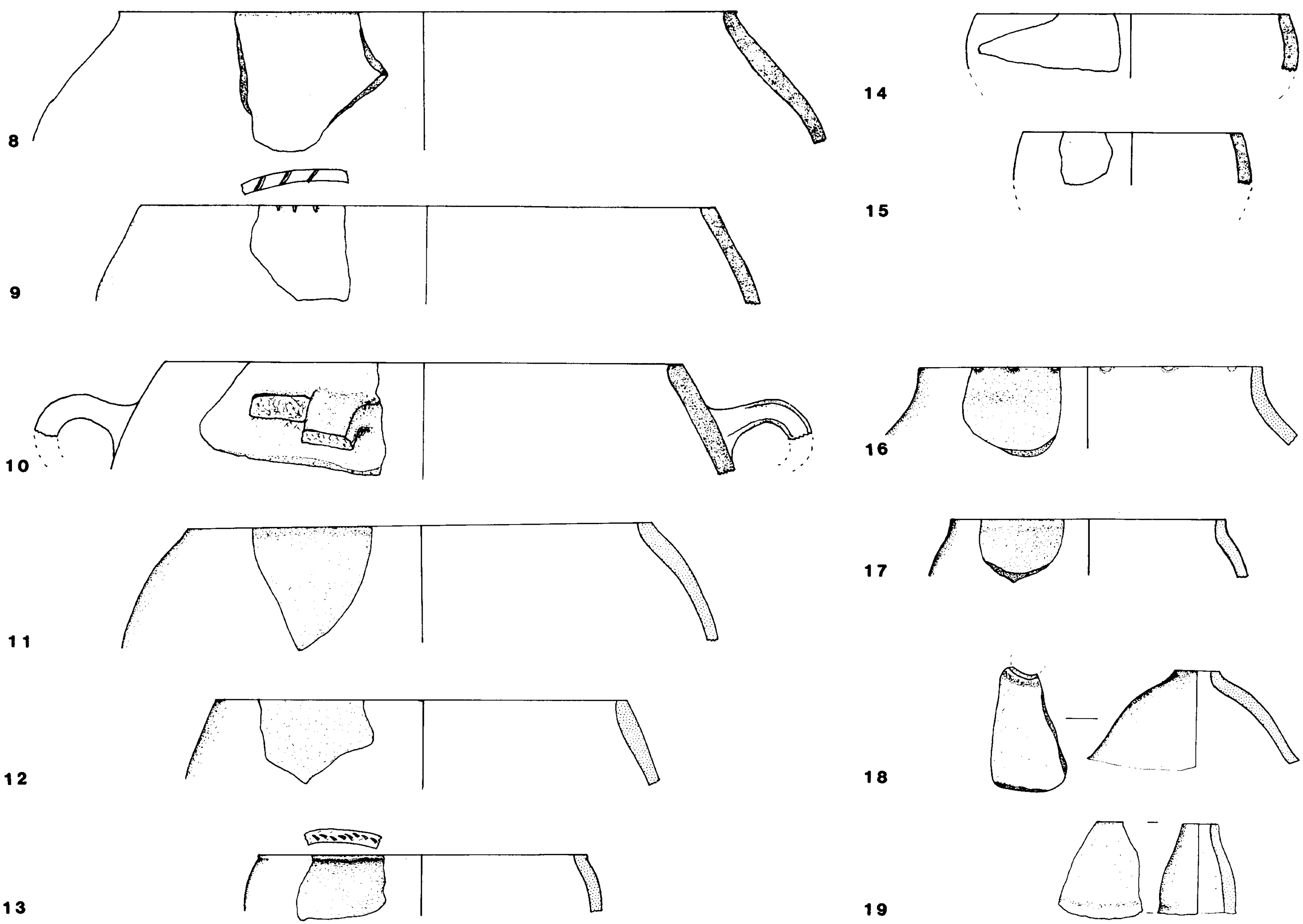
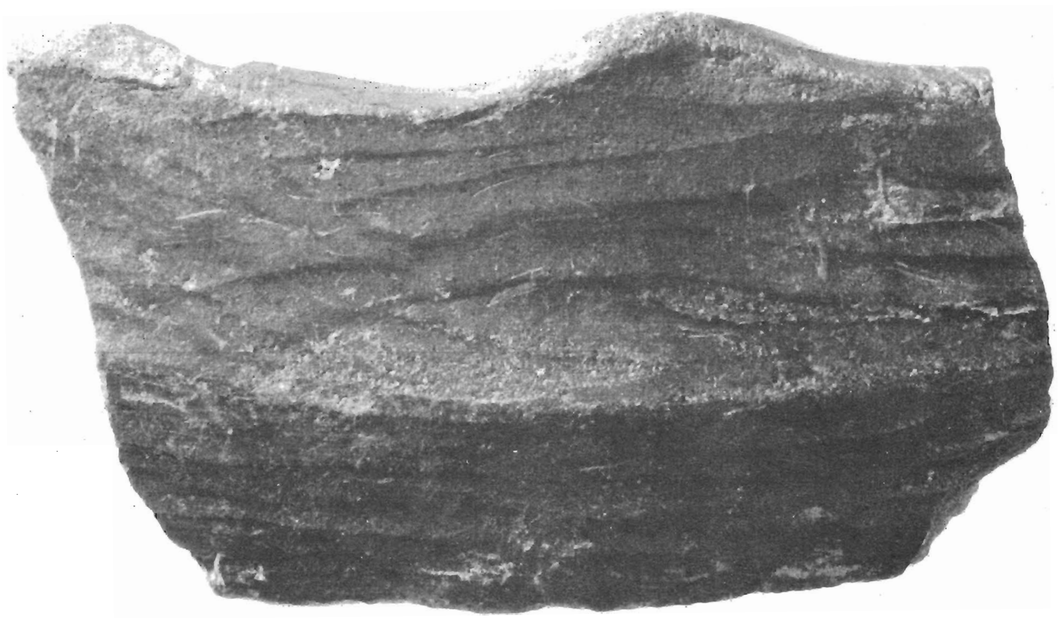


Fig. 6, close-up views of Muyu Moqo rims showing changes in lip treatment through time; **fig. 7**, Muyu Moqo A rim sherd, Unit G IX, Feature I.



Muyu Moqo A ceramics. **Figs. 8-13,** neckless ollas; **figs. 14-15,** small bowls; **figs. 16-17,** small, necked ollas; **figs. 18-19,** spouts. 1/2 actual size. See Key to Illustrations.



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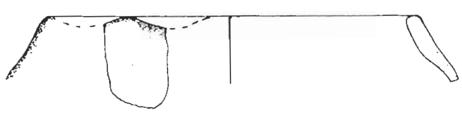

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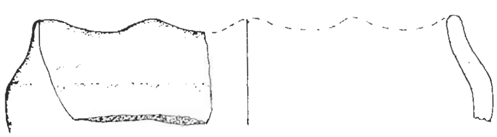

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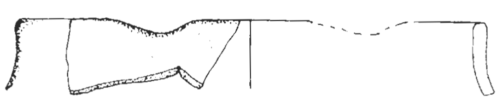

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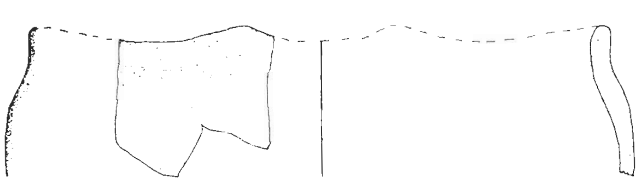

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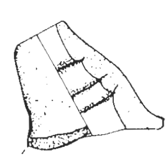

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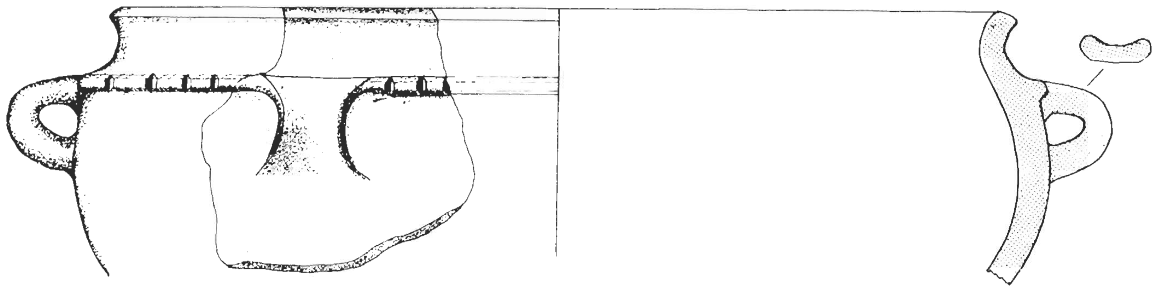
Figs. 20-26, Muyu Moqo B ceramics; drawings are 1/2 actual size. See Key to Illustrations.



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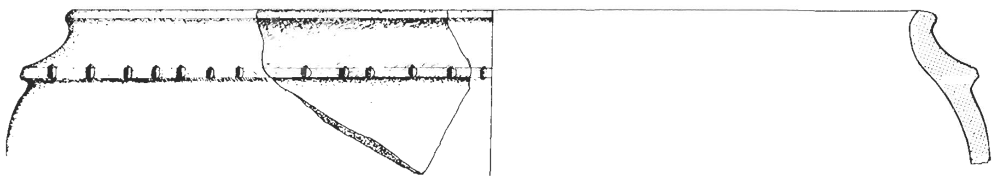

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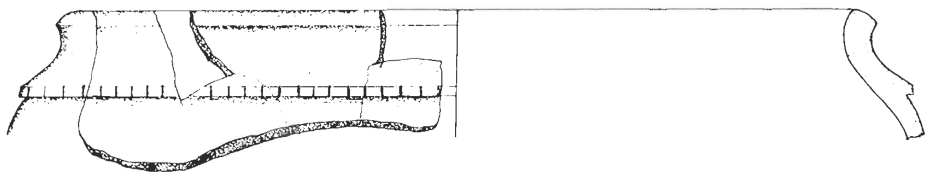

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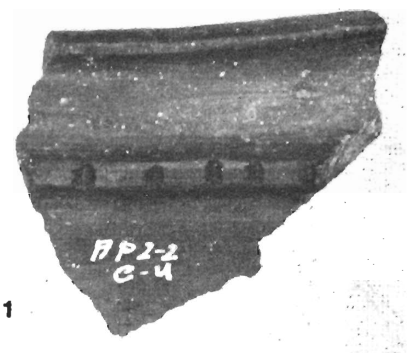

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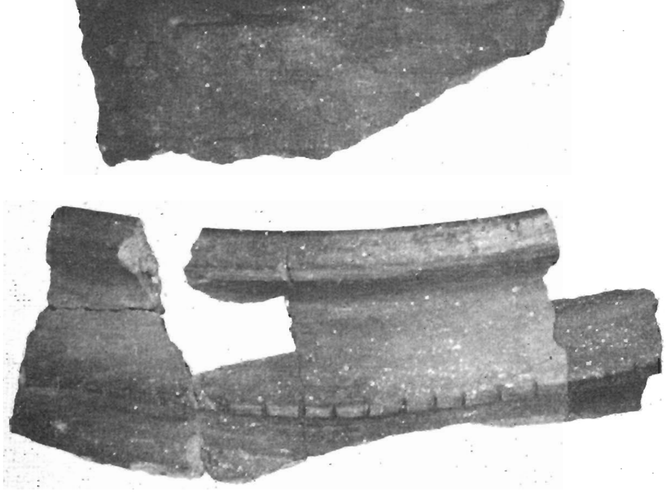

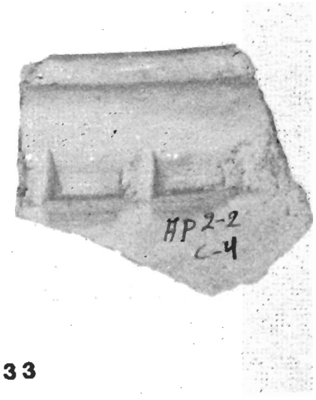

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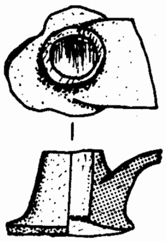
Figs. 27-33, Muyu Moqo C-D ollas; drawings 1/2 actual size. See Key to Illustrations.



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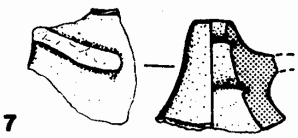

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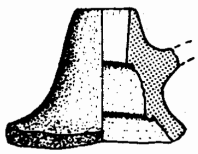

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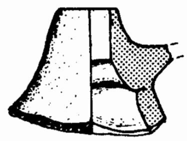

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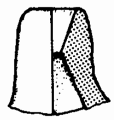

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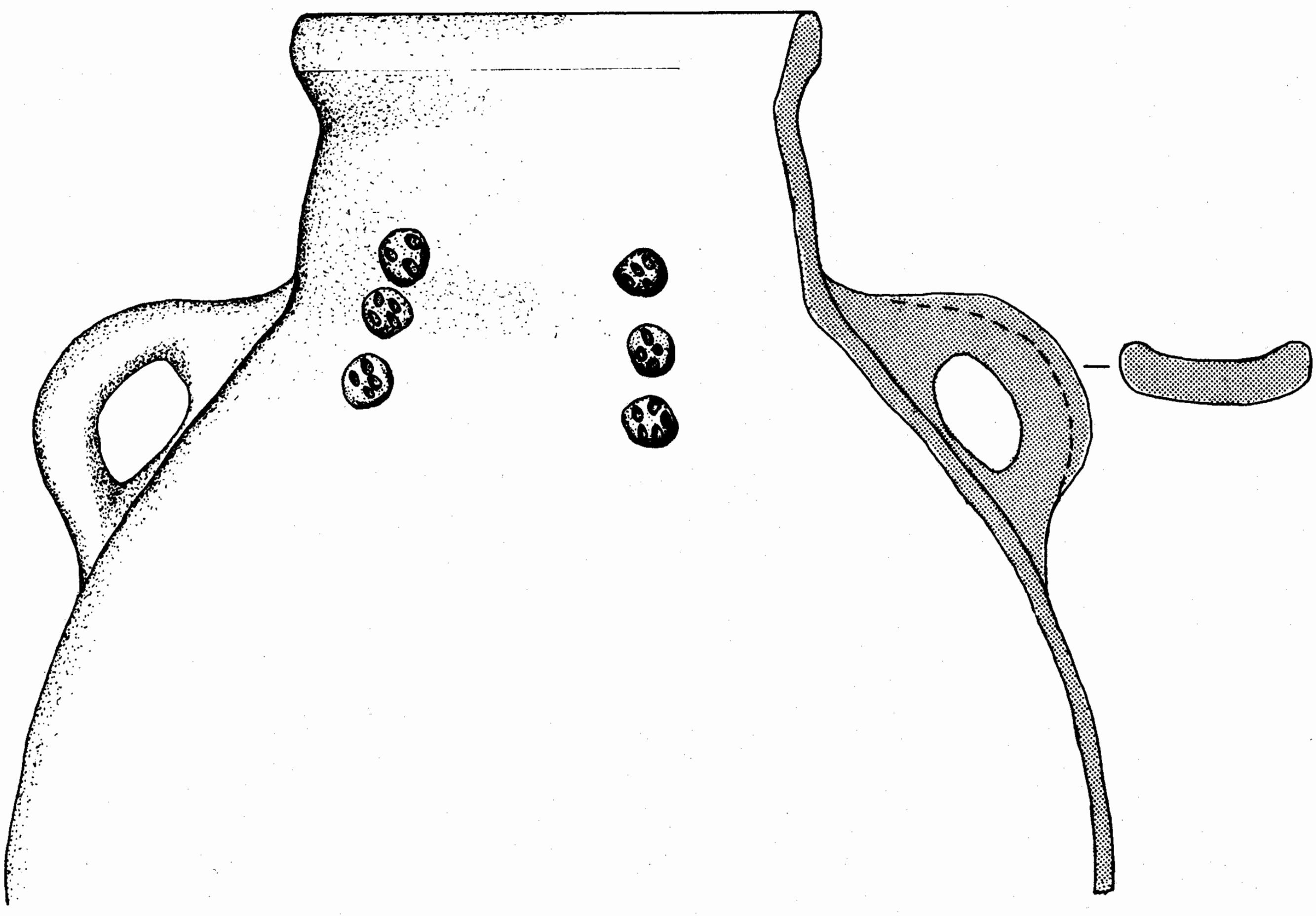
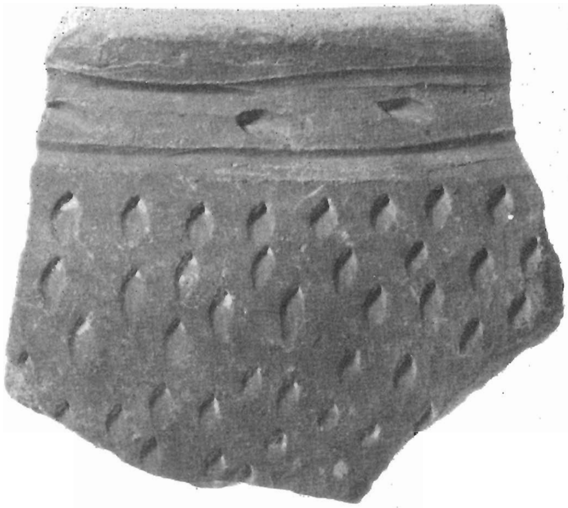


42

Figs. 34-41, Muyu Moqo C-D spouts; **fig. 42,** Muyu Moqo C-D jar with appliqué pellets. 1/2 natural size. See Key to Illustrations.



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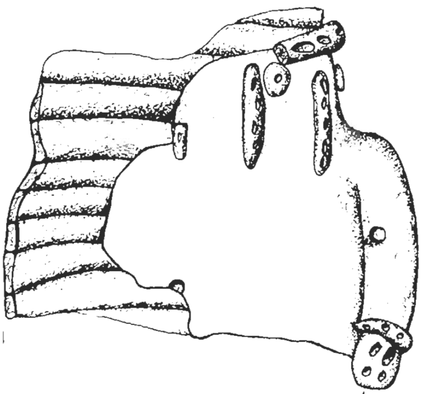

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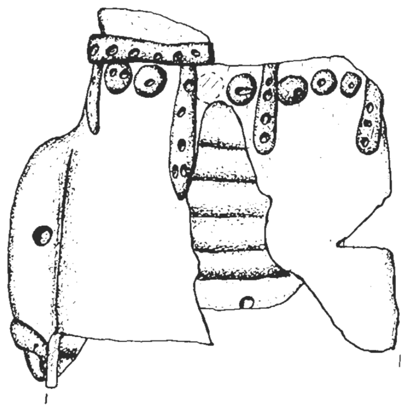
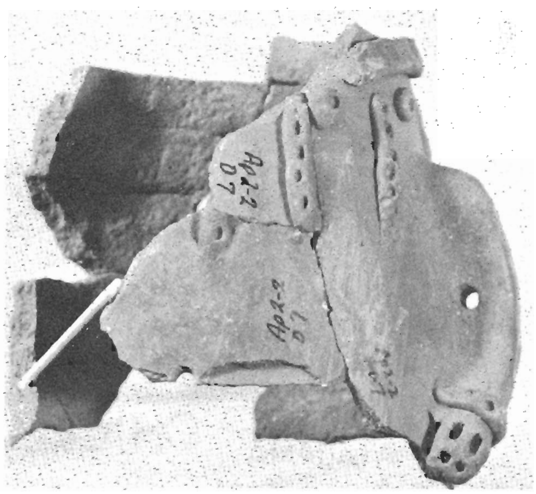
44b



44c

0 10 cm



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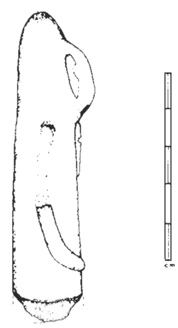
45a



45b

Muyu Moqo C-D ceramics. **Fig. 43**, rim sherd with punctation and thin red wash; **fig. 44**, partly reconstructed hollow coiled figurine decorated with appliqué; **fig. 45**, solid clay figurine. See Key to Illustrations.

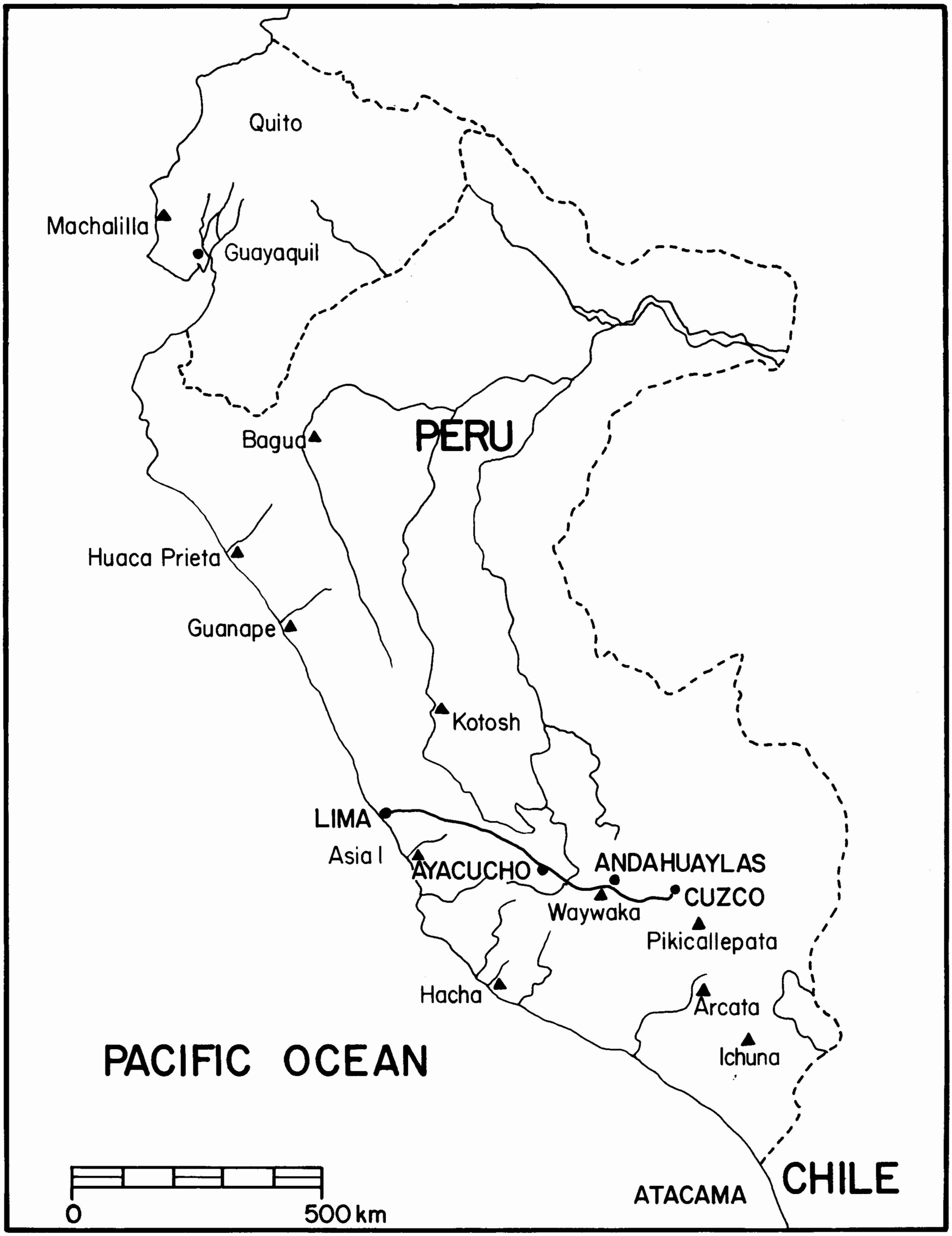
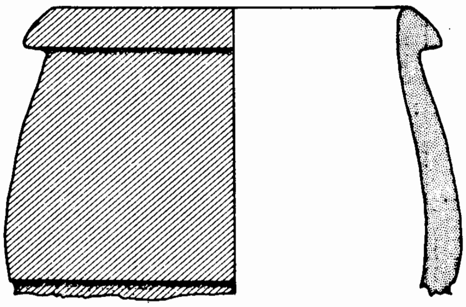


Fig. 46, Peruvian Initial Period sites discussed in the text.



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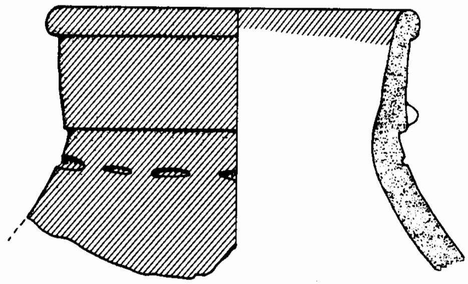

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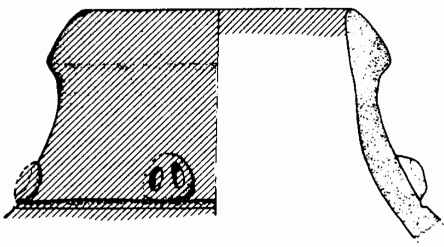

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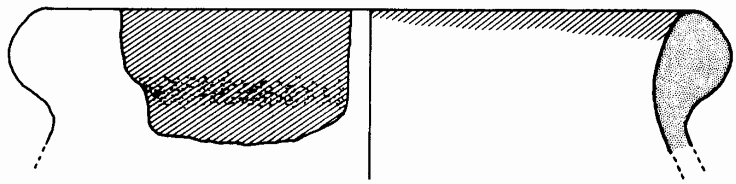

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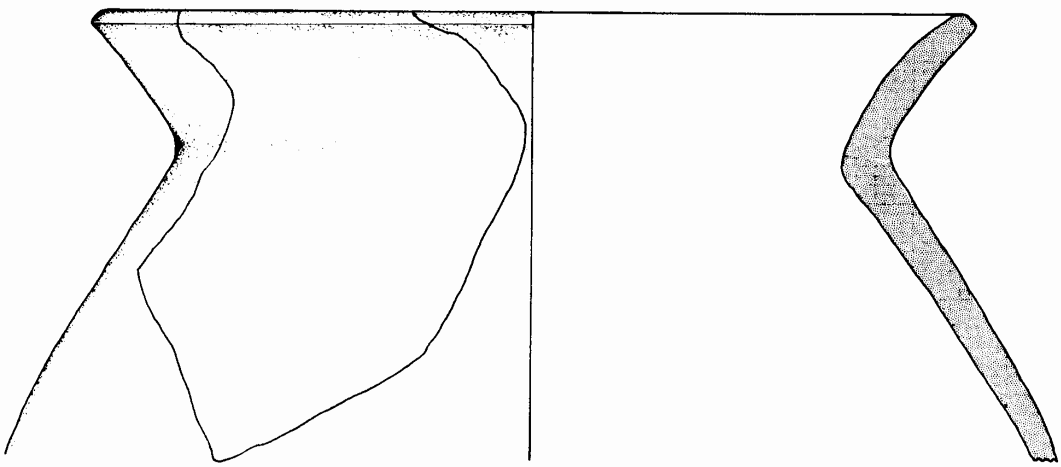

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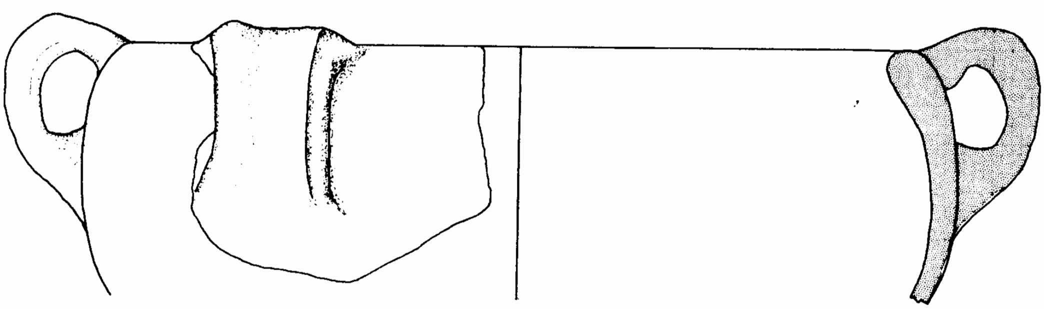
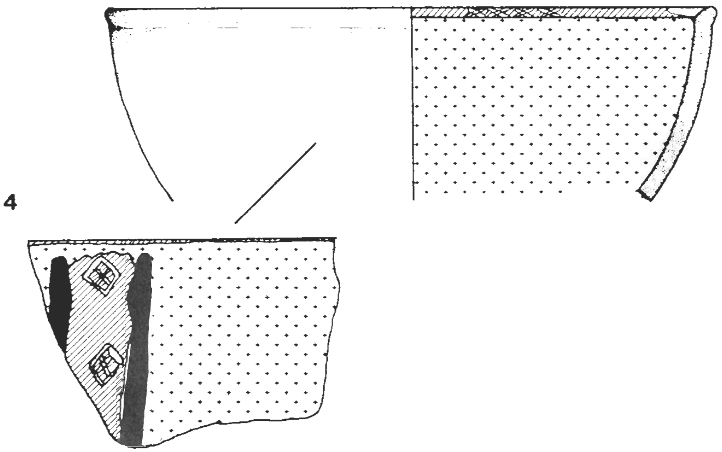


52

Qasawirka ceramics. **Figs. 47-49**, necked jars; **figs. 50-51**, large necked ollas; **fig. 52**, closed bowl. 1/2 actual size. See Key to Illustrations.

53



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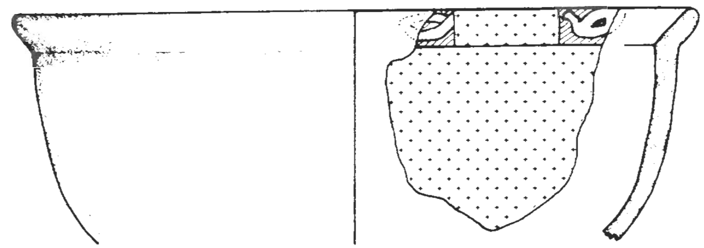

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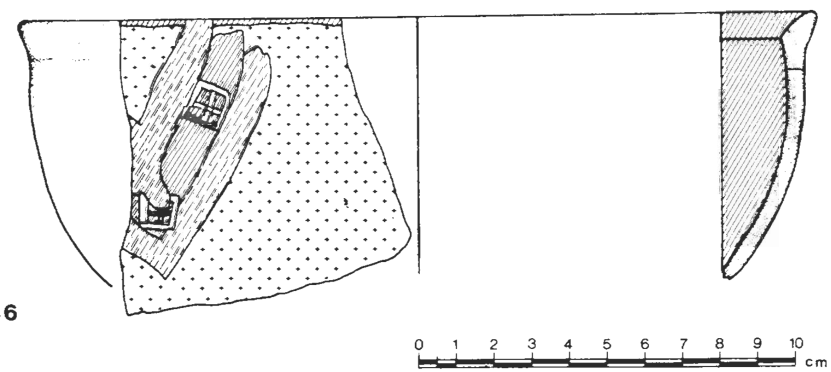
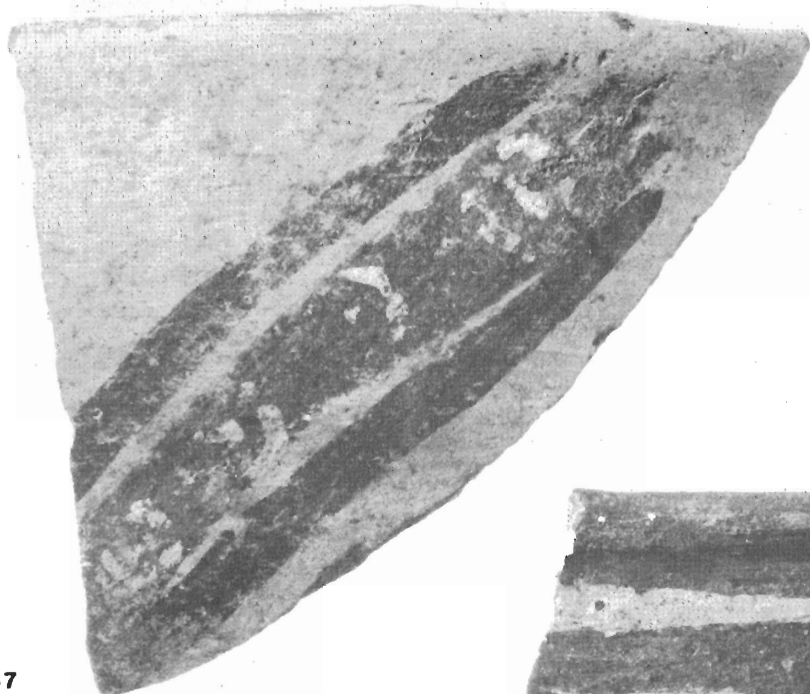


56

Fig. 53, Qasawirka miniature necked jar with conical base; figs. 54-56, fancy Qasawirka. See Key to Illustrations.



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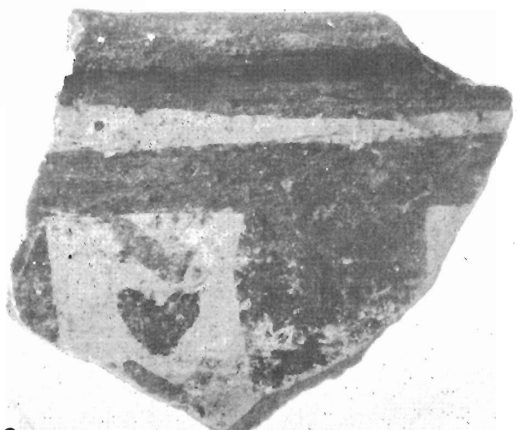

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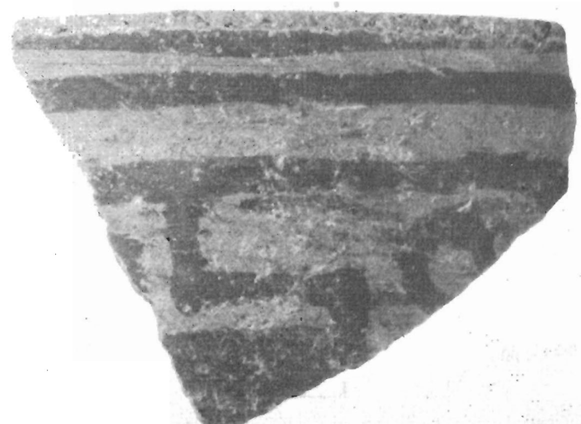
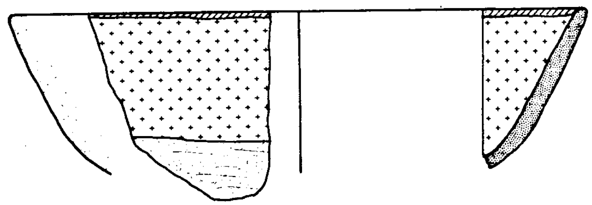


60

Fancy Qasawirka ceramics. Fig. 57, Colcapata (Ap2-26) surface; fig. 58, Colcapata (Ap2-26) surface, 8 cm. diam.; fig. 59, Qasawirka (Ap2-1) surface, 12 cm. diam.; fig. 60, Qasawirka (Ap2-1) surface.



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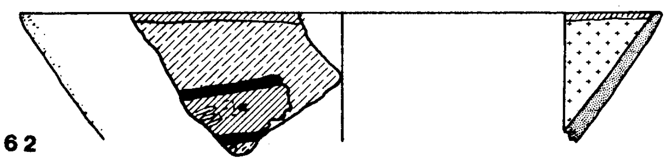

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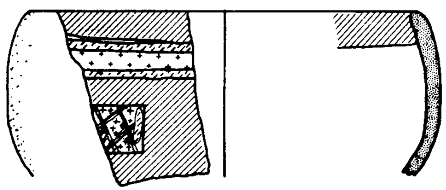

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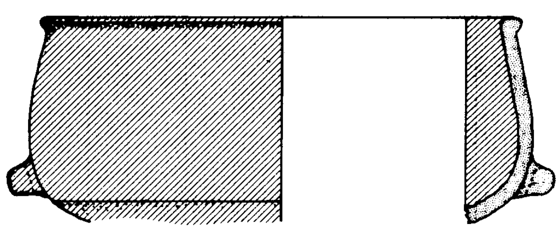

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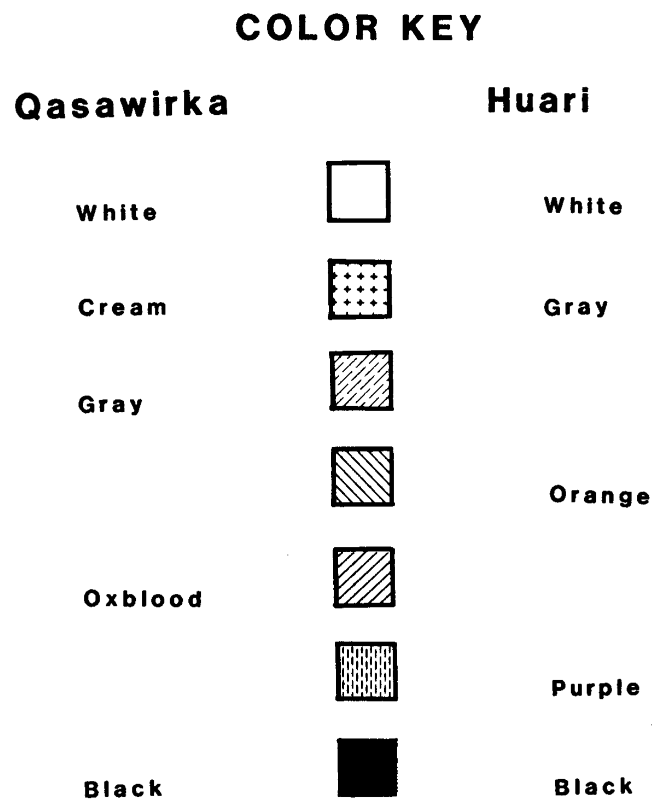
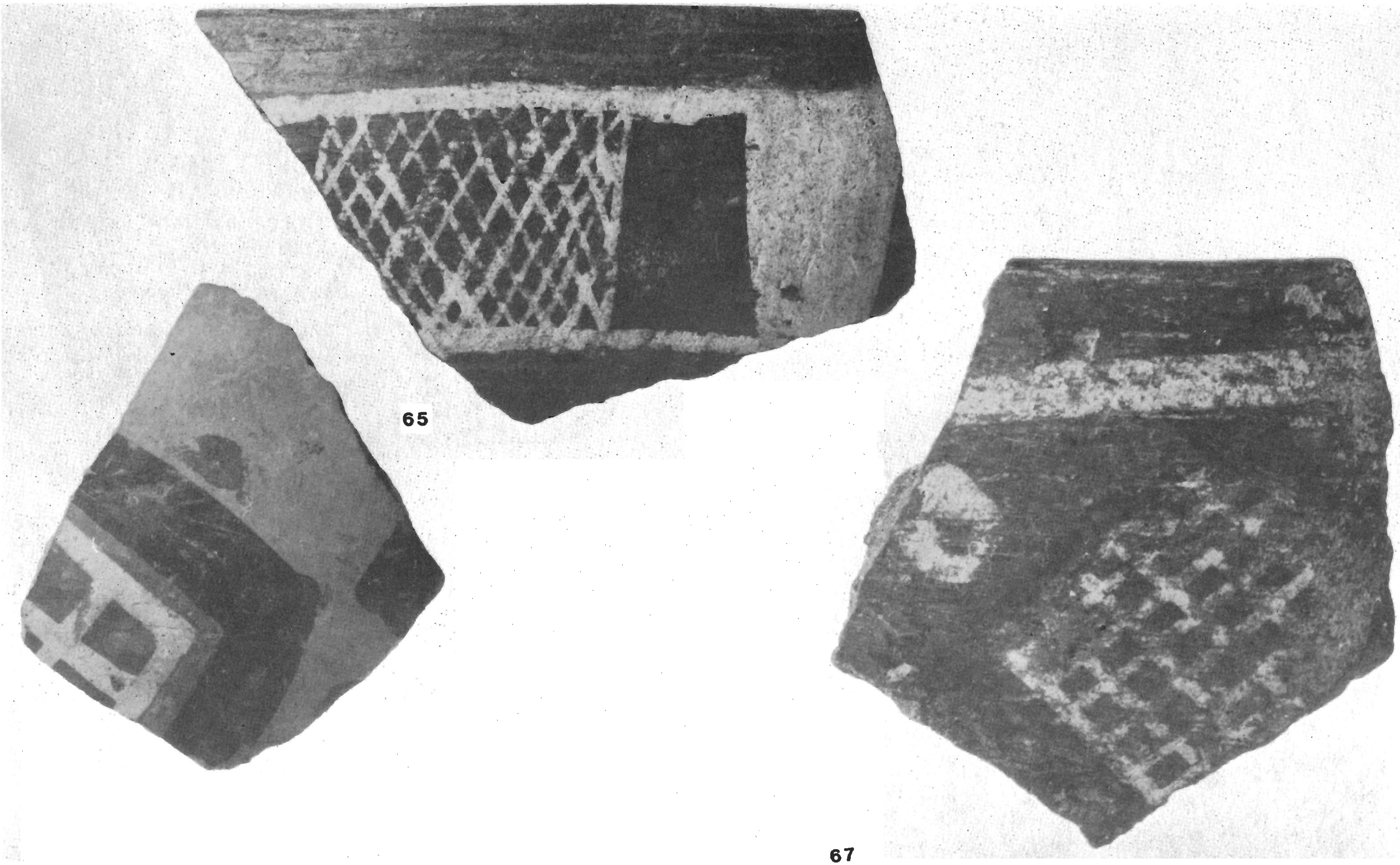


Fancy Qasawirka ceramics. **Fig. 61**, Colcapata (Ap2-26) surface; **figs. 62-64**, Qasawirka (Ap2-1) surface.



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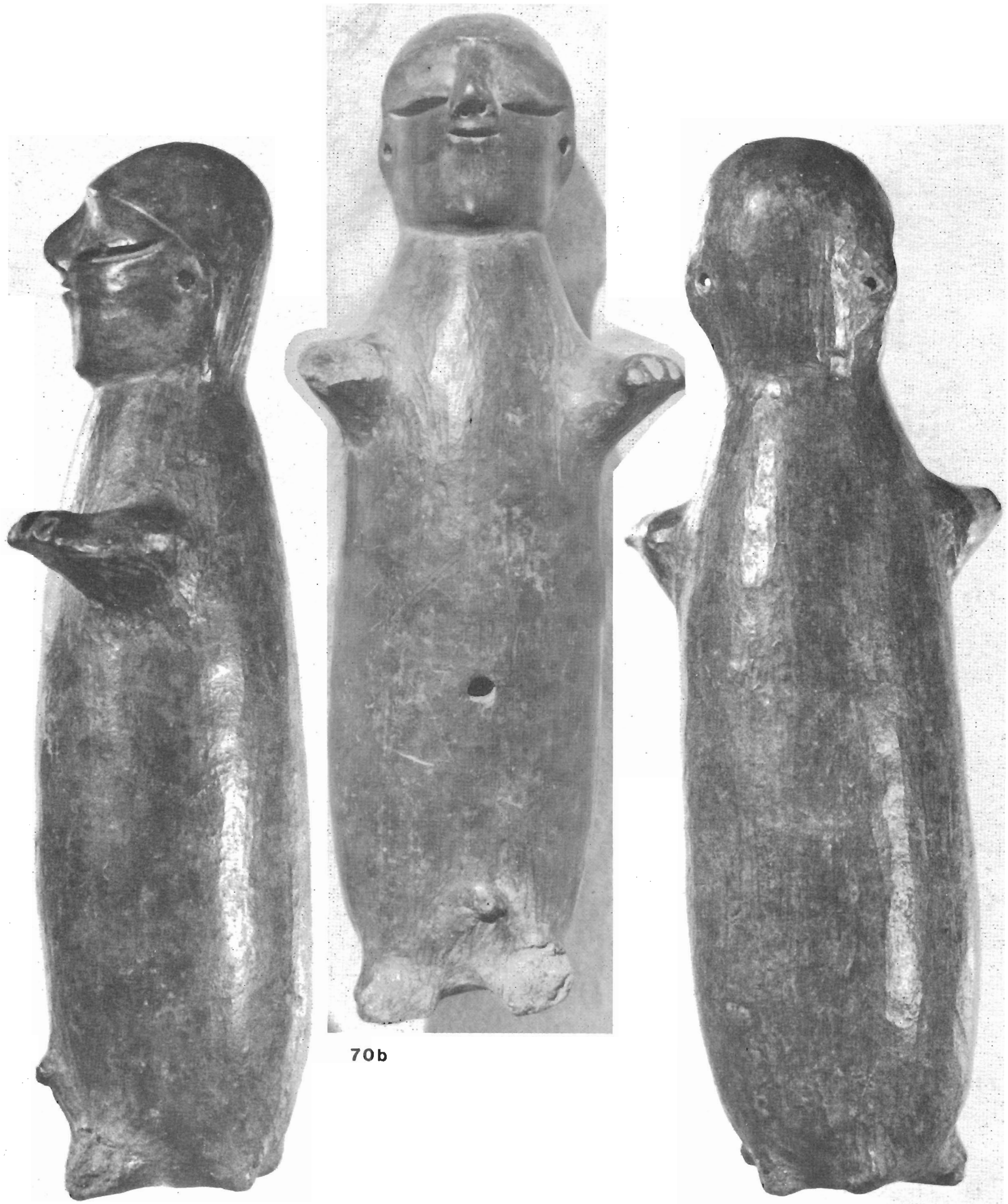
67

Fig. 65, fancy Qasawirka style, Colcapata (Ap2-26) surface; **fig. 66,** foreign sherd with fine orange paste similar to Middle Horizon 1B Ocros style from Ayacucho but with local fancy Qasawirka slip decoration, Qasawirka (Ap2-1) surface; **fig. 67,** fancy Qasawirka sherd with design similar to fig. 66, Qasawirka (Ap2-1) surface. 150% actual size.

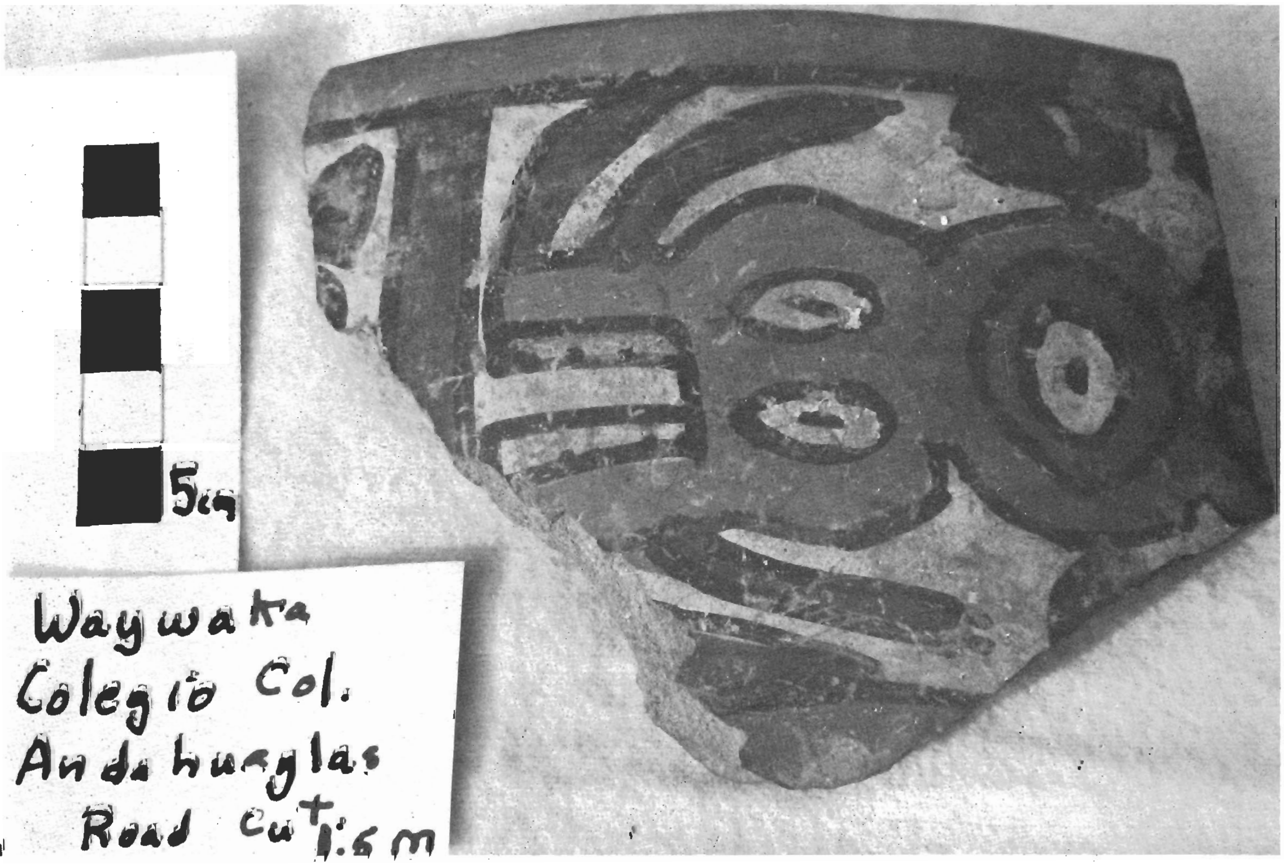
68

Qasawirka style ceramics.
Fig. 68, face-neck jar fragment from Waywaka (Ap2-2) surface, 5.5 cm. high; **fig. 69**, hollow figurine head from Colcapata (Ap2-26) surface, 6.7 cm. high. 69



70a 70b 70c

Fig. 70, Qasawirka hollow clay figurine; 20.5 cm. high, 5.5 cm. wide. Note bands of oxblood slip across each cheek. See Key to Illustrations.



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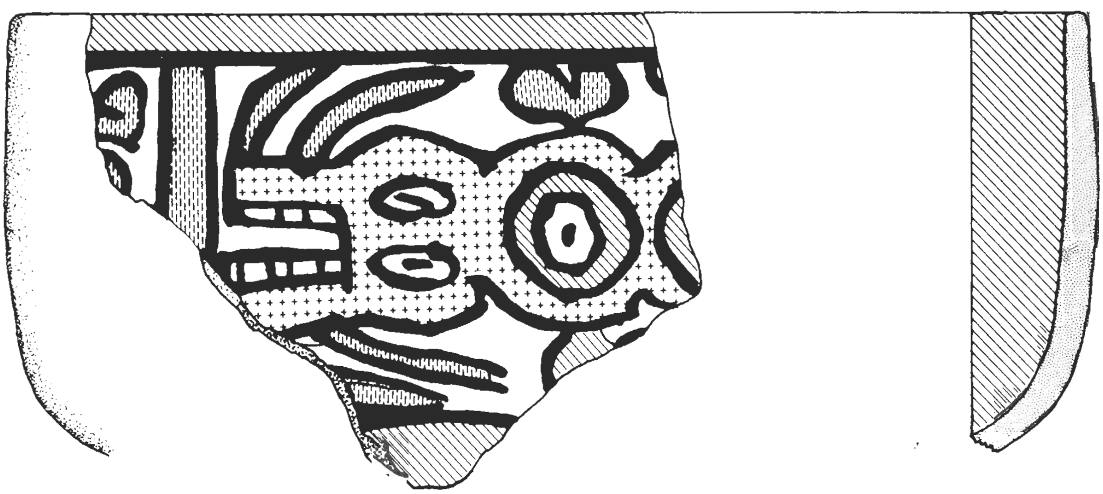
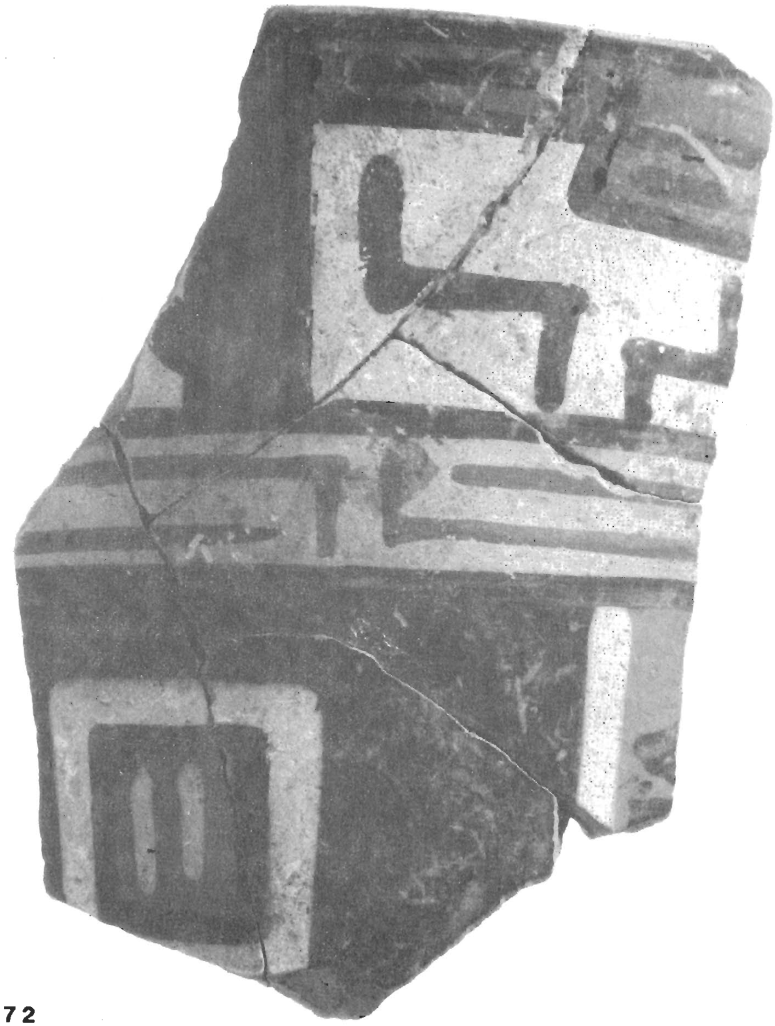


71b

Fig. 71, Chakipampa B style "Ayacucho Serpent" bowl fragment, evidence of Huari influence in Andahuaylas by at least Middle Horizon 1B. Diameter 22 cm.; collection of the Colegio de Andahuaylas. Found by a Colegio teacher in a pit, visible in the road cut on the northeastern edge of Waywaka near Unit B, where one meter of post-Middle Horizon wash covered the primary Qasawirka deposits.



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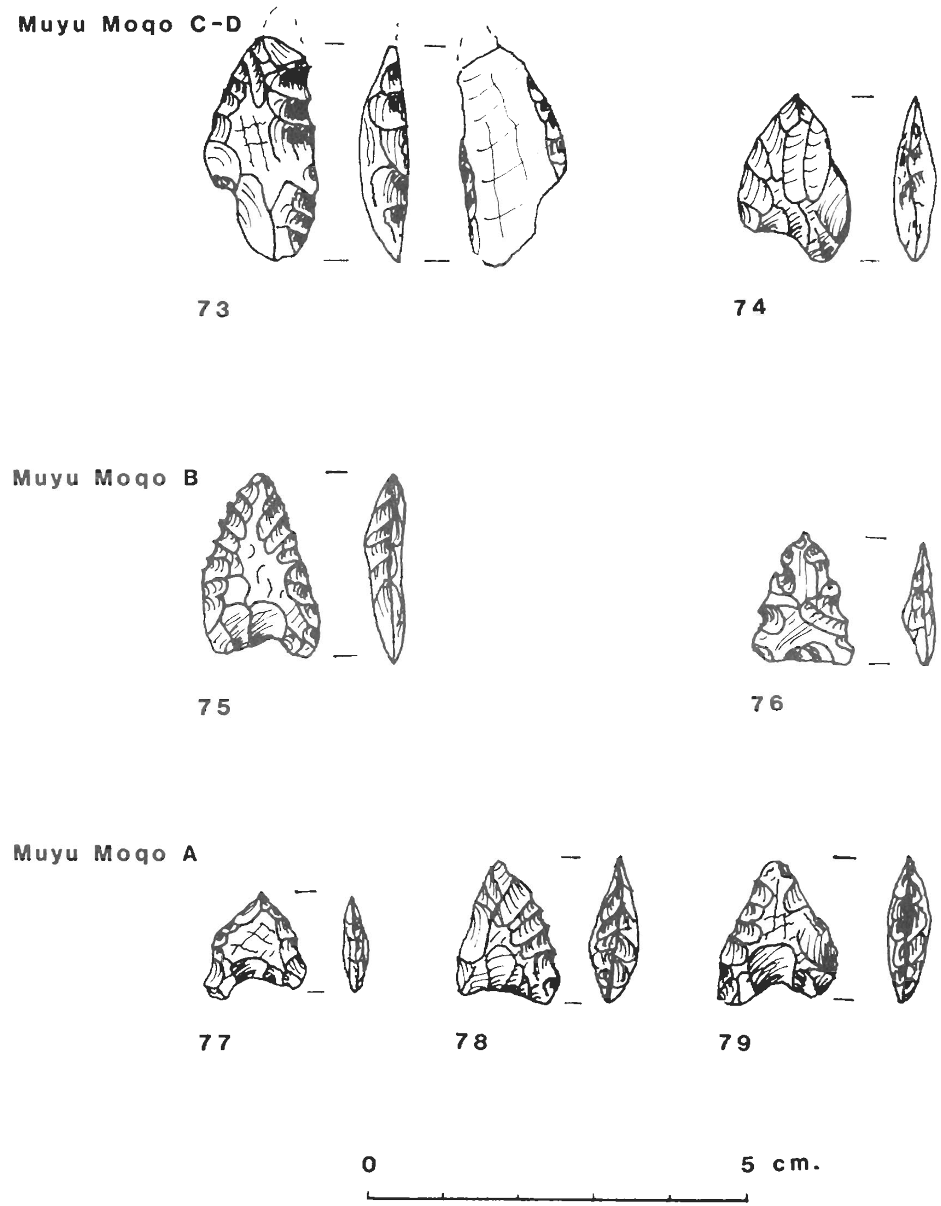
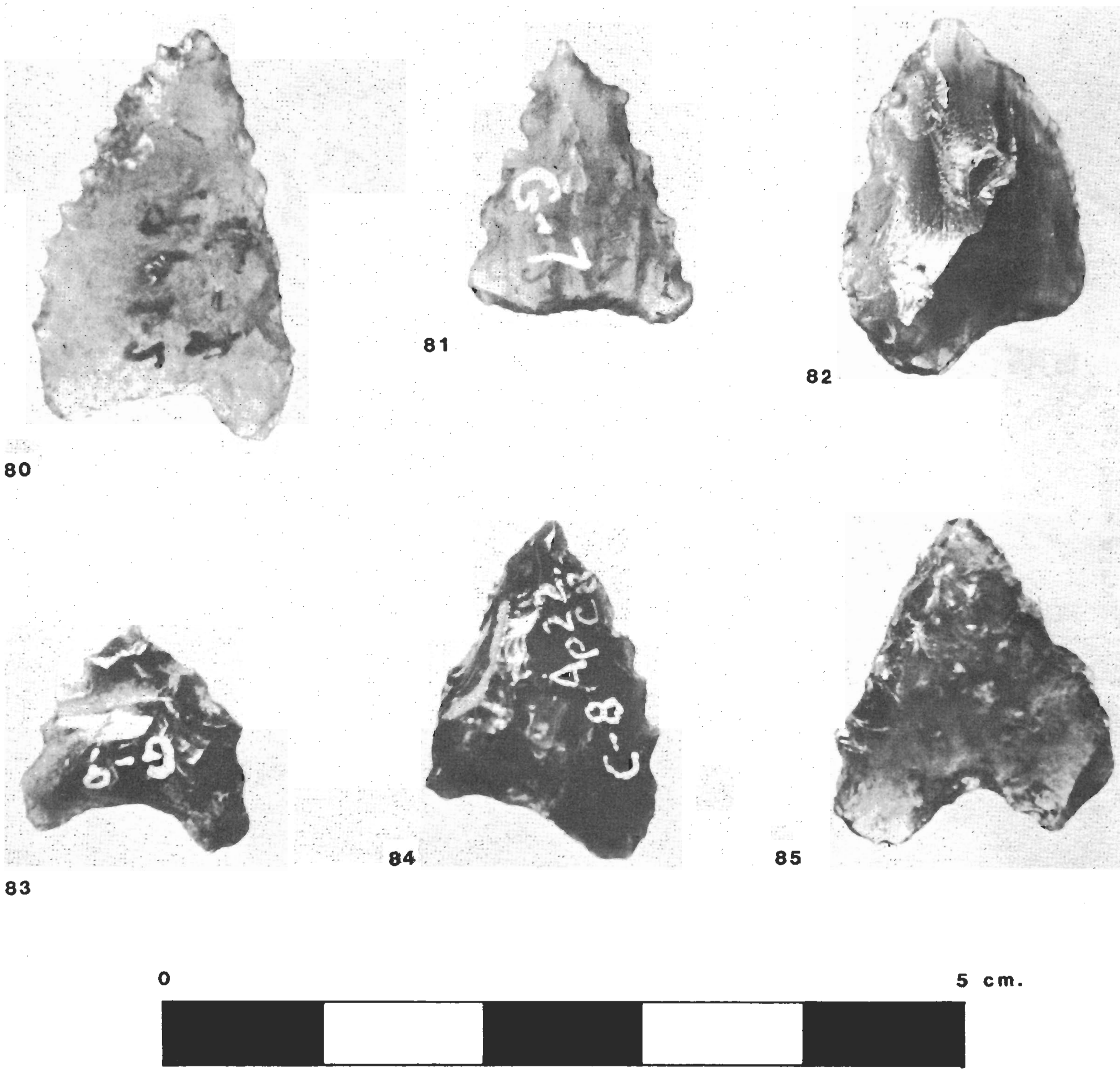


Fig. 72, Viñaque style sherd from Waywaka surface, indicating continued Huari influence in Middle Horizon 2; figs. 73-79, Initial Period projectile points from Waywaka excavations. See Key to Illustrations.



Muyu Moqo projectile points from Waywaka excavations. **Fig. 80**, Muyu Moqo B = fig. 75; **fig. 81**, Muyu Moqo B = fig. 76; **fig. 82**, Muyu Moqo C-D = fig. 74; **fig. 83**, Muyu Moqo A = fig. 77; **fig. 84**, Muyu Moqo A = fig. 78; **fig. 85**, Muyu Moqo A = fig. 79.

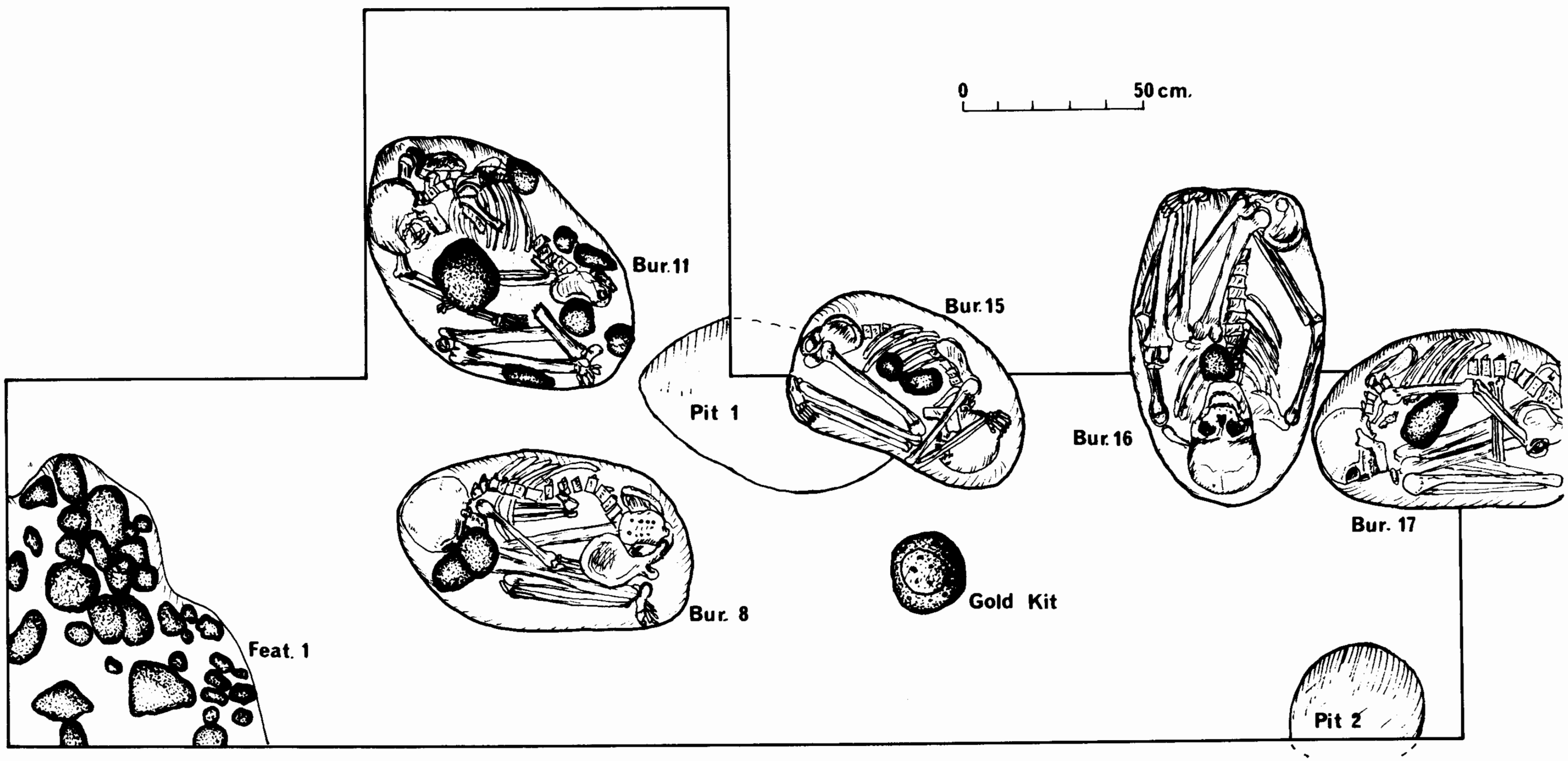
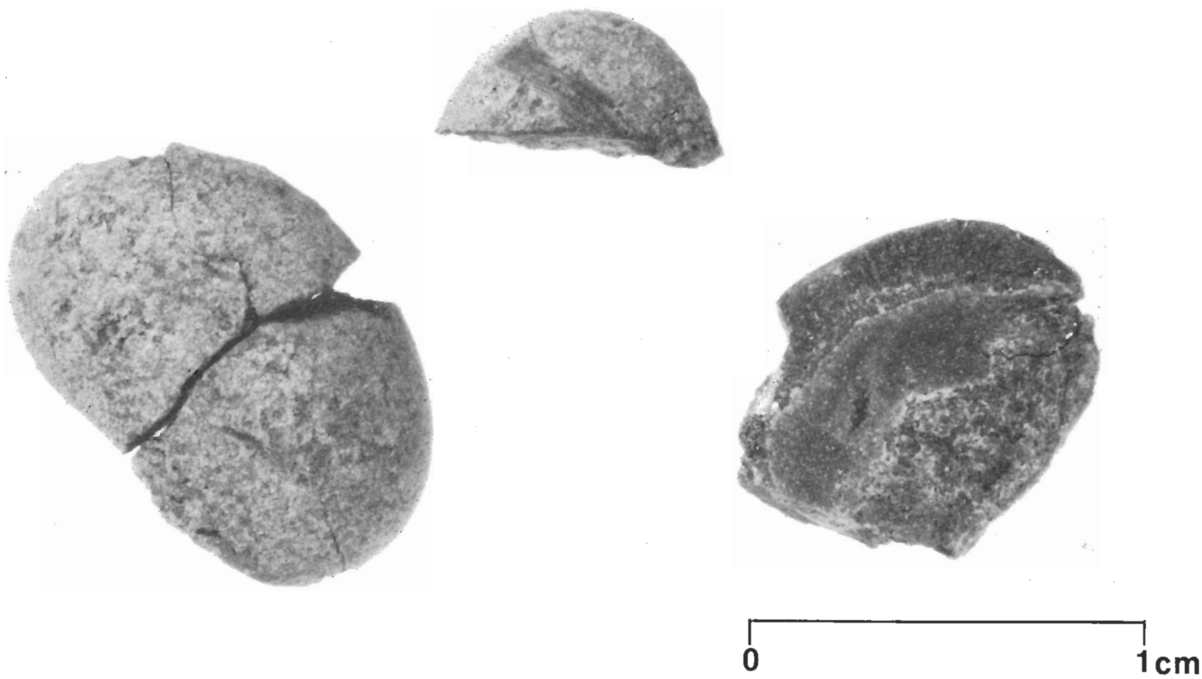


Fig. 86. Five of fifteen Initial Period primary flexed burials found partially cut into bedrock in the lowest Phase A and B strata at Waywaka. Although none contained any ceramic burial offerings, Burial 15 included lapis lazuli beads and a flake of gold foil, and Burial 16 included two flakes of gold foil.

Fig. 87, Unit C, burials 4-6; note clear stratigraphy on west (facing) wall.



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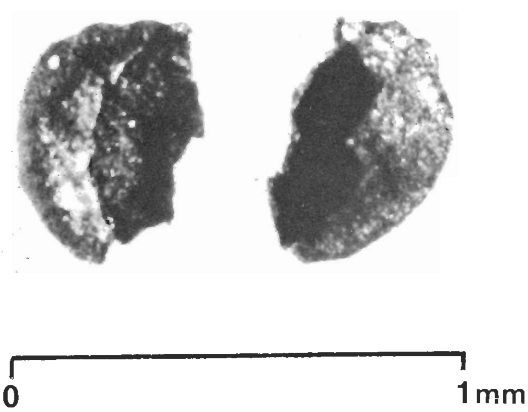

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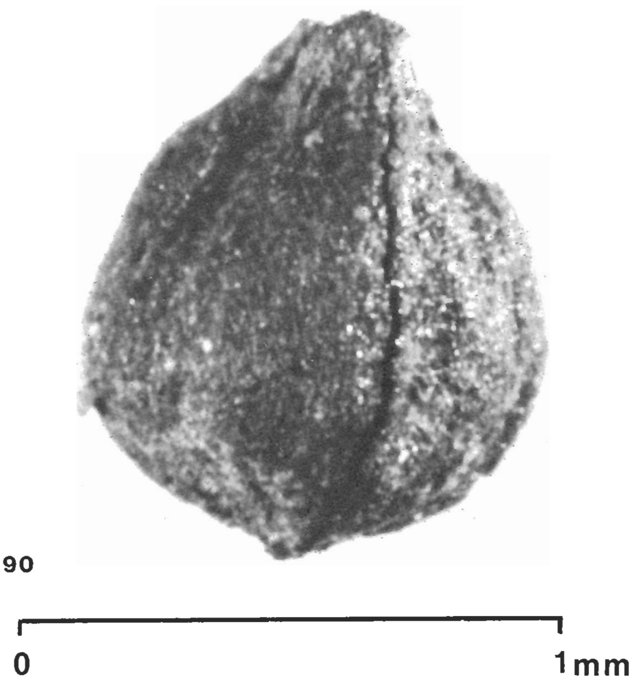

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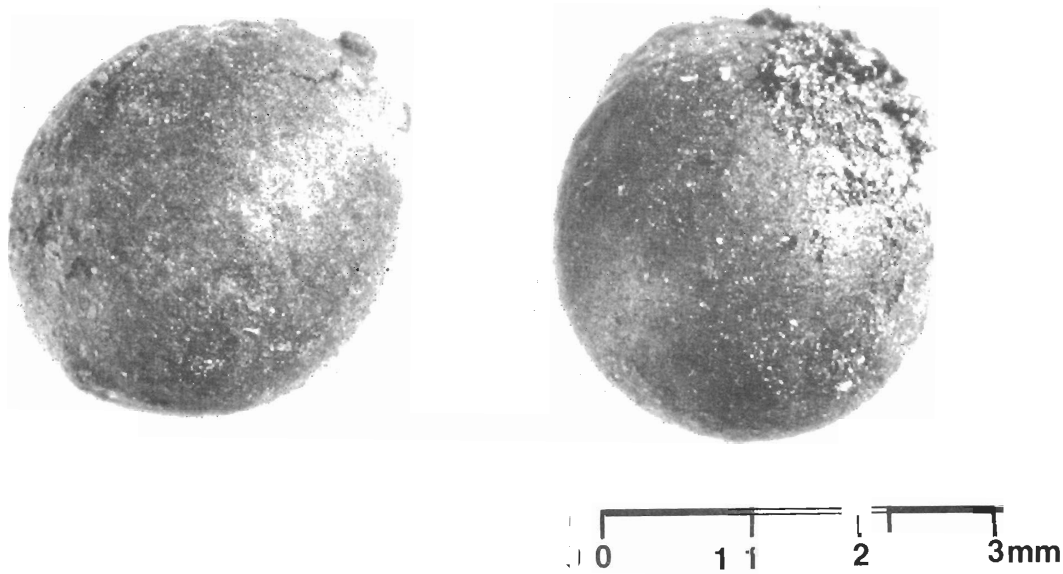
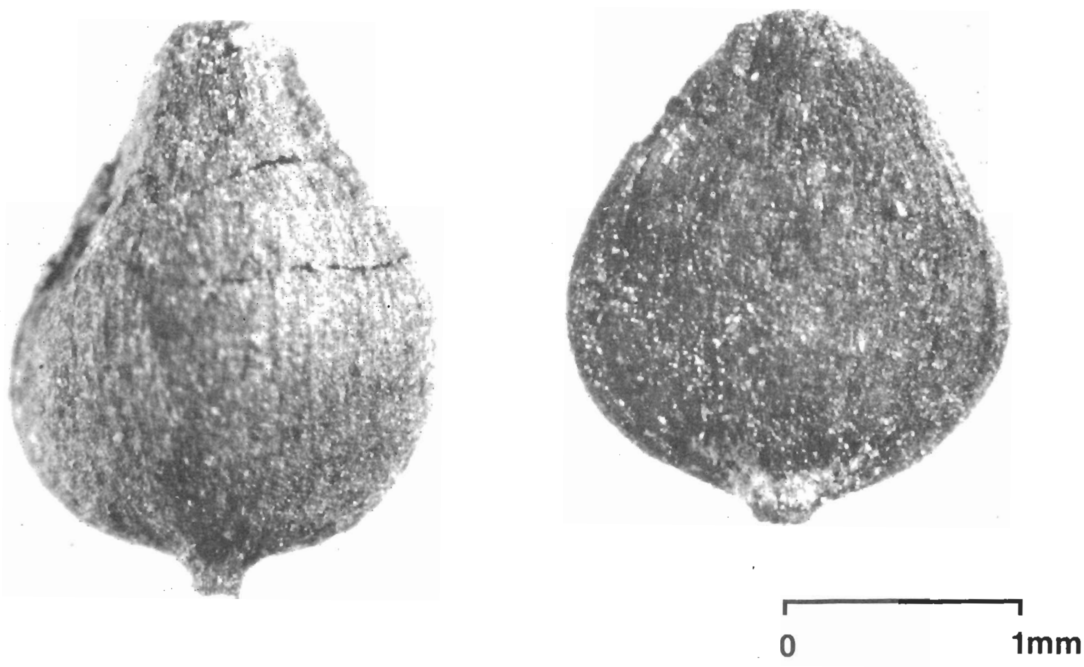
Fig. 88, carbonized bean fragments, unit D VII, pit filled with stones and Muyu Moqo C-D ceramics; **figs.** 89-90, carbonized seeds (seed types 1 and 2) from Muyu Moqo ash lens (see Appendix).

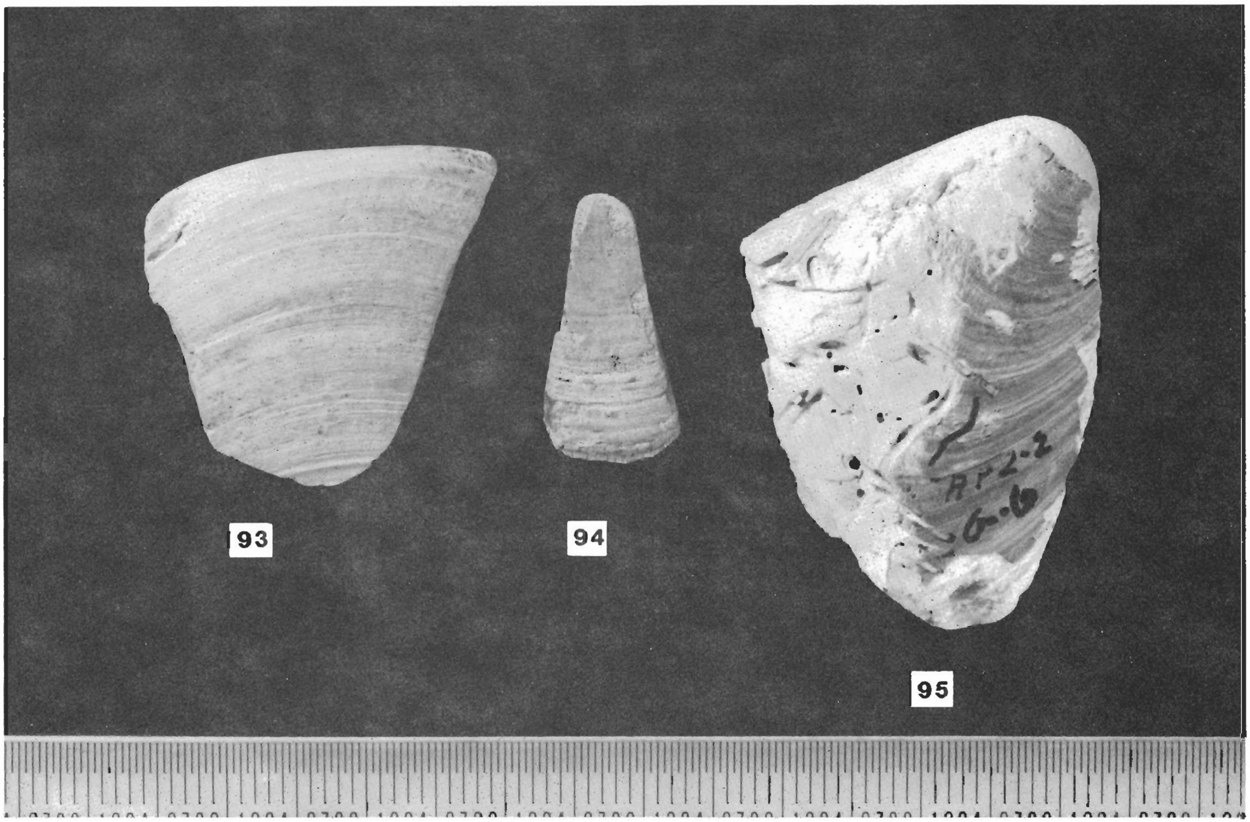


91



92

Figs. 91-92, carbonized seeds (seed types 3 and 4) from Muyu Moqo B ash lens. See Appendix.

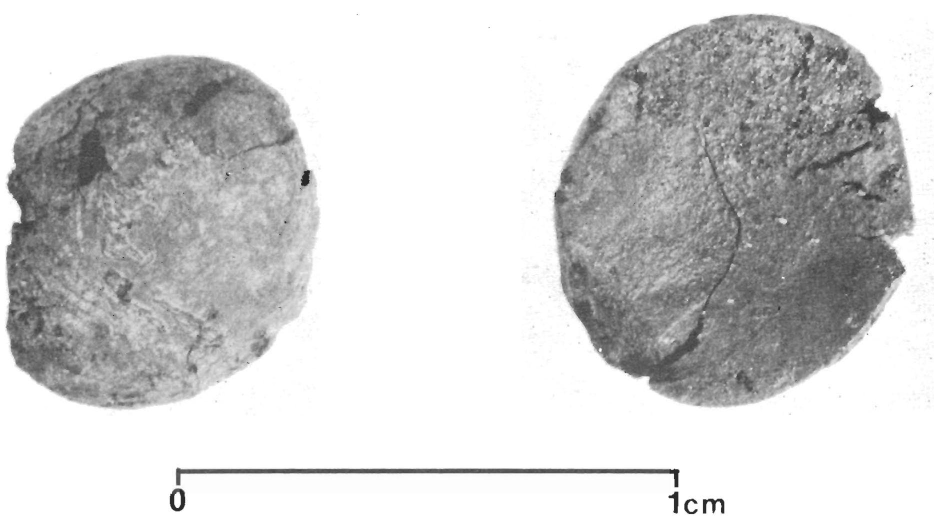


96

97

Fig. 93, Pacific clam shell fragment; **figs. 94-95,** fragments of Pacific coast mussel shell; **figs. 96-97,** fired clay miniature camelid figurines from Qasawirka cistern fill at Waywaka. See Key to Illustrations.

98



99

Fig. 98, ceremonial deer burial, units C and D, pit excavated from Qasawirka levels into Muyu Moqo refuse; **fig. 99**, carbonized fragments of unidentified field pea(?) from Qasawirka stratum (see p. 77 for associations).