

ECOLOGY AND CERAMIC PRODUCTION IN AN ANDEAN COMMUNITY: A RECONSIDERATION OF THE EVIDENCE¹

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D.E. Arnold has argued that contemporary ceramic production in Quinua, Ayacucho, Peru, is "an adaptation to the marginal agricultural environment in which people began to maximize the use of nonagricultural resources." On the basis of the Quinua data, Arnold has stated that during the prehistoric Middle Horizon period, ceramic production in the Ayacucho Valley may have been due to the same factor since Quinua is located near the ancient city of Wari, an area with "sufficient quantity and diversity of ceramic resources" and thus ecologically favorable for pottery making. However, the existence of present-day pottery-making communities in areas of rich agricultural resources challenges Arnold's conclusions. Similarly, archaeological evidence from the Ayacucho Valley conflicts with Arnold's ecological characterization of ceramic production in Ayacucho.

ANDEAN COMMUNITIES ARE not isolated units. They are well articulated internally and externally through different forms of reciprocity. Products bartering is a common means of intercommunity integration in a given valley and/or region. Product exchange is essential due to the great variability in altitude of the Andean environment and the fact that no single community controls more than one ecological zone. Each community is identified with a specific ecological zone and therefore with a particular product. For example, the inhabitants of the lower ecological zone produce corn, while those from the high-altitude puna (*sallqa*) produce tubers and/or meat and wool. Thus, it is difficult to understand the nature of an Andean community without considering the complex economic network of which it is a part.

Following Matson (1965:203), who defined ceramic ecology as "one facet of cultural ecology," in the late sixties D.E. Arnold carried out ethnographic studies of pottery making at Quinua, a community located in the Ayacucho Valley, Peru (Arnold 1975; Mitchell 1976). Arnold's ecological approach attempted to identify the factors limiting or favoring the development of full-time ceramic specialization (Arnold 1975:183, 193). Recently, Arnold (1993:13) applied the results from his Quinua study to the local archaeology, posing the following question: "How does an ecological approach to Quinua ceramic production apply to the archaeology of the Ayacucho Valley?" Because the Middle Horizon site of Wari² is located near the community of Quinua (Arnold 1993:15, 198), Arnold tried to establish a connection between the modern potters from Quinua and the ancient Wari potters by assuming continuity between past and present.

In my view, Arnold's approach conflicts with available archaeological and ethnographic data. Arnold (1975:194) considers ceramic specialization in Quinua

(*Journal of Anthropological Research*, vol. 53, 1997)

as “an adaptation to the marginal agricultural environment in which people began to maximize the use of non-agricultural resources. . . .” The role of the inhabitants of Quinua in the economy of the Ayacucho Valley and the location of other pottery-making communities not only in ecological zones lower than Quinua, but also in agriculturally fertile areas within the valley, are ignored. When Arnold (1993:204, see also Arnold 1985:94–95) points out that the area of Quinua-Wari has ecological “potential for specialized ceramic production,” he ignores the nature of the pre-Wari occupation of the valley. Furthermore, the Wari pottery-making communities of Conchopata and Aqo Wayqo, both located at 2,700 meters above sea level, an altitude lower than Quinua (Pozzi-Escot, Alarcón, and Vivanco 1994:278), are rarely discussed, while there is an overemphasis on the locations of Wari and Quinua.

This article presents new data on the ecology and ceramic production of the Ayacucho Valley. First of all, because product bartering is so important in the Ayacucho Valley, the implications of exchange strategies are discussed. Second, ethnographic evidence is presented to illustrate that communities located on agriculturally fertile land also produce pottery on a seasonal basis. Finally, archaeological data are briefly reviewed. For detailed information on the ecological zones of the Ayacucho Valley, the reader is referred to the works of Flannery, Marcus, and Reynolds (1989), Mitchell (1976, 1991), and Arnold (1975, 1993). Additional information can also be found in Rivera Palomino (1971) and Urrutia (1985).

This article is based on personal observations made in different communities of the Ayacucho Valley while I was growing up there (1970–1980) and traveled with my parents to exchange products. I observed how people dedicated to agricultural activities during the rainy season suddenly became part-time specialists during the dry season. Of all the dry-season activities, ceramic production was more important in communities such as Marcas, Atacocha, San Pedro de Cachi, Allkowitzka, Huayhuas, and, of course, Quinua. Besides for local use, pottery is made to exchange for subsistence products from neighboring communities. However, as discussed below, this does not indicate that pottery producers live in marginal lands.

PRODUCT EXCHANGE IN THE AYACUCHO VALLEY

It is not clear whether the vertical archipelago system (Murra 1975) or product exchange (*trueque*) was practiced first in the central Andes, although Alberti and Mayer (1974:27) suggest that the former existed first. Indeed, they argue that when the vertical archipelago system was fragmented and different communities took control of single ecological zones, exchange of products developed. However, some data, for instance the Warpa case (see below), show a different picture. It is possible that one of these mechanisms was important in an area while the other was practiced in another, perhaps simultaneously (Valdez 1990:54). Nevertheless, both the vertical archipelago and products exchange systems were important mechanisms that allowed dif-

ferent Andean communities to access products of several ecological zones and thus to diversify their subsistence.

The ecology of the Ayacucho Valley is not much different from that of other areas of the central Andes. From the bottom of the valley (at 2,450 m) with warm temperatures, the climate, humidity, and flora and fauna change drastically as the altitude increases towards the cold puna (at 5,050 m). In addition, there is less rainfall but more evapotranspiration at lower elevations, while the pattern is the opposite at higher altitudes. The combination of all these factors creates several ecological zones in the Ayacucho Valley (see Flannery, Marcus, and Reynalds 1989; Mitchell 1976, 1991; Arnold 1975, 1993) within a distance that one can walk in a few hours. Probably as the product of a long process of cultural adaptation, specific crops are grown in each of these ecological zones. For example, potatoes, although also grown in the moist forest zone, are associated with the puna zone, and thus those who would like to secure potatoes often establish exchange systems with potato growers from the puna. Of course, there are exceptions due to local preferences.

The puna is the zone where a variety of Andean tubers (potatoes, *maswa*, *oka*, and *olluko*) are grown and where Andean camelids (llamas and alpacas) are herded (Flannery, Marcus, and Reynalds 1989). Below the puna is the moist forest zone, where the cultivation of barley, potatoes, and some broad beans is important. In some areas, natural resources such as salt are also exploited (Arnold 1993:211–15). Meanwhile, in the lower montane savannah are crops such as quinoa, beans, wheat, chickpeas, some potatoes, and maize. In the lower montane thorn steppe, maize is the dominant crop, alongside beans, squash, split peas, and fruits (*pacae*, *lucuma*, avocado, and prickly pear). Finally, the so-called Mantaro desert zone (Flannery, Marcus, and Reynalds 1989:13) is of little agricultural significance, though products such as prickly pear (*Opuntia ficus ficus*), custard apple (*Annona chirimolia*), and others can be found. It should be noted that not all the communities located in the same ecological zone necessarily produce the same kind of crops.

The above-mentioned products are considered basic for the diet of the inhabitants of the Ayacucho Valley. Yet, they have no “direct control” over ecological zones other than their own. Therefore, exchange is the most effective way to secure products from other ecological zones and to diversify subsistence. Product exchange (*trueque*) is accomplished by the direct contact of the inhabitants of several communities located in different ecological zones (or in the same zone but producing different products). For instance, the inhabitants of the puna exchange potatoes for maize, and those of the lower montane thorn forest exchange maize for chickpeas or salt. In this manner, any product can be exchanged for another of similar value if both sides are in agreement. Rules of exchange (*tupu*, *tiry*) and (decimal, or *chunka*) measurements are well known by the inhabitants of the valley (Valdez 1990; Vergara, Arguedas, and Zaga 1983), but their origins remain unknown. When a product is exchanged for the same amount of another product, the transaction is called *tiriy-tiriy* (equal-to-equal), as is the case when dry corn is exchanged for broad beans, for instance.

Two types of exchange systems operate in the Ayacucho Valley area: one is practiced only during the dry season (*chiraw*), and the other takes place year-round in the local weekly markets. The first type occurs shortly after the harvesting season (mid-May), just after produce for household consumption is stored, and lasts until the end of August. When products are stored, a certain amount is reserved for exchange, since travelers from other zones are likely to arrive at any time. After the harvesting period, farmers have free time to travel from one zone to another securing other products. This traveling takes place in all directions. Around July, coca is the product highly valued because of its use in rituals associated with animals (*uywas*), which take place from July 25 to August 30, and also because the main farming season, which curtails traveling, starts shortly thereafter, particularly in the communities located at higher elevations where rainfall occurs first. In this type of bartering, women and men both participate, and the trips can sometimes last from four to five days.

While this type of product exchange, which involves long trips (Valdez 1990) and house-by-house visiting, is restricted to the dry season, another kind of exchange takes place weekly all year-round. The main settlements of the valley, such as Quinua, Huamanguilla, Huanta, and Luricocha, to mention a few, are centers where a large number of people gather to barter their products. This exchange system, called *yanquikuy*, is mostly a women's activity. When a woman offers corn for potatoes, for instance, she says "yanquikuway papaykita saraywaq" (let me exchange your potatoes with my corn). The largest and perhaps most famous *yanquikuy* for the entire Ayacucho Valley takes place each Sunday morning in Huanta. During the dry season, this type of exchange is less important since most people are involved in longer bartering trips. In both types of exchange, money is rarely used.³

Not all the products exchanged are directly related to the diet. An example is coca, which comes from the Apurímac Valley and is usually distributed by the inhabitants of the lower montane thorn steppe zone. Because coca is used in many activities related to agriculture, religion, and other social events (e.g., marriage), it is more important than other crops. The fact that any product can be secured in exchange for coca indicates that this tropical product is highly appreciated in the Ayacucho area.

It is important to point out that not everyone exchanges agricultural products for food products. Pottery is an example of a nonagricultural product offered for exchange. Because storage facilities are required for the diverse variety of crops produced in the region, large pottery vessels are required. The inhabitants of the valley who live below 3,400 m, for example, consider *urpus* to be the ideal type of pottery for storing products like beans, wheat, barley, quinoa, chickpeas, split peas, maize, and dehydrated Andean tubers such as *chuño*, *muray*, and *kaya* (Flannery, Marcus, and Reynolds 1989:figs. 2.5, 2.6). The narrow necks of these large vessels are easily covered to discourage mice. In addition, other types of pottery used for storage are *maqmas* (large open vessels) and *tinajas* (also open, but smaller than *maqmas*). In some cases, a vessel can be used for a generation or longer.

The preparation of maize beer and molle beer, called *chicha*, also requires a variety of large ceramic vessels. *Chicha* is heavily consumed by the inhabitants of the Ayacucho Valley and elsewhere in the central Andes, especially during religious celebrations (fiestas), weddings, and agricultural activities. The types of vessels commonly used are *maqmas* and *urpus*, in addition to *puyños* (small, narrow-necked vessels) and *tinajas*, with each type being used at different stages of *chicha* making. As a result, there is a great demand for these ceramics, and the best time to secure them is the dry season. Finally, when families organize religious celebrations, many plates for feeding the assistants are required. When all these uses of ceramics are considered, the presence of pottery-making communities appears to be very important. As described below, the community of Huayhuas provides pottery to the inhabitants of the central and northern parts of the Ayacucho Valley.

In short, the exchange of products stands at the core of the household economy in the Ayacucho Valley. When immediate access to lands located in different ecological zones is not possible, direct contact between the peoples who live in various ecological niches is established through *trueque* and *yanquikuy*. This type of reciprocity is crucial, and those involved in the exchange system understand that a failure is likely to undermine social relationships and the exchange network. A community cannot exist isolated from its neighbors; it must produce to give to others.

THE POTTERS OF HUAYHUAS

The community of Huayhuas is located just outside of the Huanta Valley in the northern portion of the Ayacucho Valley, four kilometers southeast of the city of Huanta. In comparison to Quinoa, which, at an elevation of 3,350 m, lies at the edge of the ecological zones of moist forest (3,400–4,000 m) and lower montane savannah (2,850–3,400 m) (see Arnold 1975), Huayhuas, at 2,850 m, is situated at the border between the lower montane savannah and the lower montane thorn steppe (2,500–2,850 m). Mitchell (1976:30) describes the latter zone as “warmer, sunnier, and drier than the higher ecological zones.”

The inhabitants of Huayhuas, and of most Ayacucho Valley communities, are agriculturalists. As in Quinoa (Arnold 1993:54; Mitchell 1976:33) and other parts of the valley, farming is primarily carried on during the rainy season (*poqoy*) in a type of agriculture known as *hatun tarpuy* (Mitchell 1976). Nevertheless, during the first months of cultivation and maturation, irrigation is necessary, using water that comes down from the eastern mountains. The main wet-season crop cultivated in Huayhuas and other nearby communities is maize, followed by broad beans and potatoes. During the dry season (*chiraw*, May–August) there is not enough water for dryland farming due to the lack of rainfall, but the scarce water that still comes down from lakes located in the eastern high mountains is used to grow some crops, mostly of Old World origin, such as wheat. This second type of agriculture, which depends exclusively on irrigation, is called *michka* in the Ayacucho Valley and elsewhere in

the central Andes (Mitchell 1976). In this manner, the rainy and dry seasons are identified with two different types of agriculture.

Due to the shortage of water, *michka* is not as important as *hatun tarpuy* in Huayhuas and other parts of the valley. Mitchell (1976:33) presents similar data for Quinua, where *hatun tarpuy* remains the most important farming method, while *michka* is "restricted to a small proportion of the fields," again due to a shortage of water. Therefore, most families in Huayhuas, as elsewhere in the Ayacucho area, have free time during the dry season to produce handicrafts or to perform other nonagricultural activities. As in Quinua (Arnold 1993:54), pottery production is the dominant activity, but it still is only a complement to agriculture. The primary importance of agriculture is clearly illustrated by the practice of *michka*, which is indeed a challenge to the dry conditions of *chiraw*.

While Arnold (1993:59) points out that weather, climate, and scheduling conflicts with agriculture account for the seasonal pottery production in Quinua, these factors do not appear to operate in Huayhuas. Instead, as noted above, the shortage of water forces the people to produce pottery. Arnold assumes that at lower elevations climate does not limit the existence of full-time specialists because people from lower ecological zones than Quinua do "not face the same climatic constraints on their ceramic production as Quinua potters" (Arnold 1993:205). In theory, this seems plausible; however, in Huayhuas, we also find a case where pottery production remains only a part-time activity. Were there more water during *chiraw* in Huayhuas, the inhabitants likely would practice intensive *michka* rather than ceramic production. That all nonagricultural activities stop right at the beginning of the rainy season and that the inhabitants of Huayhuas are the first to provide green corn to the local market demonstrate that this is an agricultural community. Further, the fact that access to water during the dry season is highly disputed also indicates the importance of agriculture in the community. This case is totally at odds with the assertion that potters live in agriculturally marginal land.

Besides the shortage of water, perhaps the most important factor that has provoked pottery making in Huayhuas is the fact that its inhabitants have very little that is different to offer to neighboring communities. As already noted, Huayhuas is located between two major zones: one identified with potatoes and the other with maize. This leaves Huayhuas in a disadvantaged position because the communities of the valley prefer to do *trueque* with communities that can offer a large amount of some crop different from their own. As a result, corn producers do not establish product exchange with Huayhuas to secure potatoes. Similarly, inhabitants of the puna avoid offering their potatoes to residents of Huayhuas because their potatoes can be exchanged for more corn just a few kilometers down from Huayhuas. Of course, if the agricultural season is unsuccessful in one of those zones, the inhabitants of Huayhuas are likely to have some kind of temporary advantage, but this situation is unpredictable. Therefore, people from Huayhuas need something distinct to offer to their neighbors, and this is pottery. Using pottery, they secure

products from the puna, such as freeze-dried tubers (*chuño*, *muray*, and *kaya*), as well as crops from the lower zones, including coca.

The same situation faces the inhabitants of Oqochaka, located just north of Huayhuas, who have developed metal work, which is indispensable for farming. Likewise, the community of Runguyoc, located just northeast of Huayhuas, is not a pottery-making community either, even though it has the same possibilities as Huayhuas for producing pottery; instead, its inhabitants are adobe makers, house builders, and meat traders.

In this manner, any kind of handicraft work is complementary to agriculture and thus is carried out during a season when agriculture cannot be practiced. Handicraft work is basically oriented to securing agricultural products. An exception, perhaps, is the spinning and weaving for local use which is done in the eastern puna of the Ayacucho Valley during the dry season. However, camelid herders (*michi*) of the western puna produce textiles that are distributed during the dry season among communities that practice agriculture. Dry-season activities such as pottery making are mechanisms developed in order to keep in contact with the inhabitants of other ecological zones from whom other products can be obtained in return. When the rainy season returns, all handicraft work stops as agricultural activities begin. In this case, I wonder if the description "potters" for the inhabitants of Quinua (and also of Huayhuas), who spend less than five months a year producing pottery, is correct, considering that most of the year (or all year with *michka*) they are dedicated to agriculture. Interestingly, Mitchell (1976:39) argues that in Quinua the most important ceremonial activity is the so-called *yarqa aspiy*, which is directly related to irrigation and agriculture. This fact seems to corroborate the proposition that in Quinua we are dealing with farmers. However, when Mitchell (1976) presents Quinua as an agricultural community, it is unfortunate that he ignores pottery production.

Arnold (1993:69) argues that "Quinua potters live in an ideal ecological niche for pursuing a combination of pottery making and agriculture." However, this situation is not peculiar to Quinua but also applies to most communities of the valley and adjacent areas that are situated in ecological zones below 3,400 m and even to some located above 3,400 m. While Huayhuas is a good example of a lower-elevation community which practices agriculture and pottery making, Hagstrum (1989) has noted that the community of Quicha Grande, located over 3,750 m in the Mantaro Valley, also produces pottery during the dry season. Thus, there appear to be no ecological limitations on pottery production, and most communities can be considered to be located in niches ideal for both agriculture and pottery making. In addition, raw materials for ceramic production can be found throughout the Ayacucho Valley.⁴ It is interesting to note that potters from Huayhuas obtain raw materials from within the limits of communities in the lower montane thorn steppe ecological zone which do not themselves produce pottery.

That some communities of the Ayacucho Valley produce items other than pottery does not imply that their settings are unfavorable for making ceram-

ics. In order to find out why only some communities make pottery, it is critical to view the communities within the framework of the regional exchange system. If all the inhabitants of the valley dedicated their dry-season free time to the same kind of activity, for instance to pottery making, not all of them would be able to convert their pottery into food. At the same time, there would be a high demand for other products. The same can be said if all the inhabitants of the valley were to spend the dry season making adobes and building houses. Therefore, pottery production, and any other dry-season activity, is a strategy practiced by some communities in order to maintain a relationship with the inhabitants of the whole valley. The final purpose of all these dry-season activities is, as Arnold (1993:52) notes, "to supplement their returns from subsistence agriculture," thereby obtaining other products by exchange from other communities and thus diversifying their diet.

Hence, in order to interact with different communities and to obtain other products, the inhabitants of a given community produce items that other people need. As a result, a traditional community that produces pottery, such as Huayhuas, is likely to make pottery that its neighboring communities need. Indeed, Huayhuas potters make utilitarian ceramics used for transporting water and *chicha* (*aysaku*, *puyño*, *tumin*, and *qipiri*), for cooking (*manka*), for serving food (*platos*), for making and fermenting *chicha* (*maqma* and *urpu*), for toasting and popping maize (*toqto* or *kallana*), and for storing food (*tynaqa*, *maqma*, and *urpu*) (for shape illustrations, see Arnold 1993). This situation indicates that potters from Huayhuas have close ties to adjacent communities in the valley. In other words, Huayhuas potters produce ceramics used extensively by the inhabitants of the valley, including residents of Huamanguilla (Arnold 1993:131)—a community located closer to Quinua than to Huayhuas—and of Huamanga. This network probably is strategic to the inhabitants of Huayhuas since it implies easy access to agricultural products from other zones.

THE ARCHAEOLOGICAL EVIDENCE

The pre-Wari, or Early Intermediate period (c. 100 B.C.–A.D. 600), occupation of the Ayacucho Valley is characterized by the Warpa culture (González Carré and Bragayrac Dávila 1986:10; Lumbreras 1974:134; MacNeish, Patterson, and Browman 1975:50–51). Archaeological research carried out in this part of the central Andes has shown that Warpa sites are concentrated in the Ayacucho Valley (Chahud 1969; Lumbreras 1980:22). Most of them are located in the area where corn cultivation currently is most important (González Carré 1982:70; Isbell 1985:74, 1987:84; Lumbreras 1975:84), below where the modern community of Quinua is situated. Though characterized by greater evapotranspiration and less rainfall than occur at higher elevations, lands below 3,000 m are considered to be the richest areas of the valley (Rivera Palomino 1971:120; Urrutia 1985:25) because they are less hilly and water from the mountains (Figure 1) can be used for irrigation. The areas where the cities of Huanta and, in particular, Luricocha⁵ are located are considered to be the most fertile of all the Ayacucho Valley.

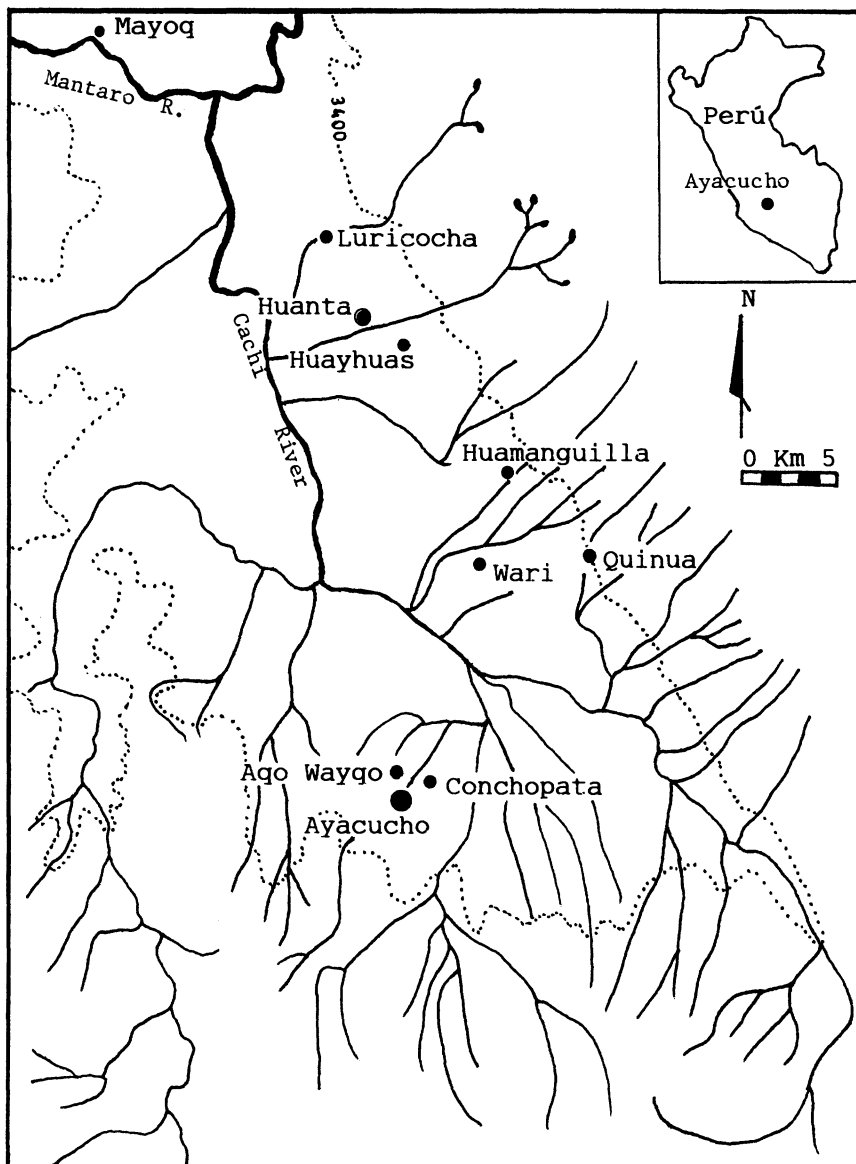


Figure 1. Location of the Modern Communities of Luricocha, Huayhuas, Huamanguilla, and Quinua, and the Archaeological Sites of Wari, Aqo Wayqo, and Conchopata in the Ayacucho Valley

Like any other pre-Columbian Andean culture, Warpa is mostly known from its pottery. The characteristic Warpa pottery is the so-called Warpa Black/White (Rowe, Collier, and Willey 1950) and Warpa Ante (Benavides Calle 1970). During the later phases of the Early Intermediate period, the Warpa developed the Cruz Pata and Okros styles, which strongly show the influence of

cultures of the south coast of Peru (Lumbreras 1975; Menzel 1964). Interestingly, no Warpa sites have been registered to date above 3,500 m and in the puna zone (Matos Mendieta 1980:475; Valdez 1996). Similarly, no Warpa sites have been located on the west bank of the Cachi River (Figure 2), most likely because this land is not irrigable for agricultural purposes and thus is marginal land. Finally, no Warpa sites are known outside the Ayacucho Valley (Valdez 1994, 1996). Thus, the available archaeological information indicates that the pre-Wari inhabitants of the Ayacucho Valley were settled in the zone currently identified with corn production and agriculturally the most fertile. Since pottery was produced during this period, it can be argued that this product was made in areas located below the community of Quinua.

Meanwhile, current archaeological studies indicate that Warpa pottery has been found in only four places beyond the Ayacucho Valley. These are the Plazapata site, located in the Caballuyoq puna area north of the Ayacucho Valley (Bonavía 1967–1968); Chuschi Orqo (Raymond and Isbell 1969), located in the Pampas Valley, south of the Ayacucho Valley; the Jargampata site in the San Miguel Valley (Isbell 1977:43); and the sites of Comas, Nawpallaqta, and San Cristóbal in Julcamarca (Bendezú Flores 1983, 1986). With the exception of Jargampata, these places are located in the puna or near the puna; indeed, in these areas tuber cultivation and camelid herding dominate over corn. Due to the absence of Warpa sites in the puna and outside the Ayacucho Valley and the presence of puna products in Warpa sites (e.g., Andean camelid bones) (Pozzi-Escot and Cardoza 1986; Valdez 1985), the inhabitants of this valley appear to have developed product exchange systems during the pre-Wari period (Valdez 1996). In the case of camelids, all parts of the animal have been recovered from Warpa sites, which suggests that these animals were bartered live. Meanwhile, the absence of infant/neonate camelid remains strongly suggests that these animals were not raised in the valley. Hence, the occurrence of Warpa pottery outside the Ayacucho Valley and in places where tuber cultivation currently is important probably is the result of exchange.

If the above explanation is correct, the inhabitants of the Ayacucho Valley, most likely, were already involved in the exchange of products in pre-Wari times. The lack of Warpa sites in the puna area, whose occurrence there would have allowed vertical and direct control over several ecological zones (Murra 1975), perhaps was due to the presence in that area of non-Warpa populations with whom the Warpa people maintained ties of complementarity. As Arnold (1993:211) correctly argues, “The [Ayacucho] valley was in a superior position for the abundant production of maize, which today, at least, is the most highly valued Andean crop.” If so, it appears likely that the inhabitants of areas outside the Ayacucho Valley traveled towards this valley in order to secure maize and other valley products. This inference is reasonable, considering that in the pre-Columbian Andes, llamas were the animals used for transportation (Flannery, Marcus, and Reynolds 1989:89), particularly if it is assumed that llamas were under the control of puna communities. Hence, the inhabitants of the puna were likely to develop systems of product exchange to

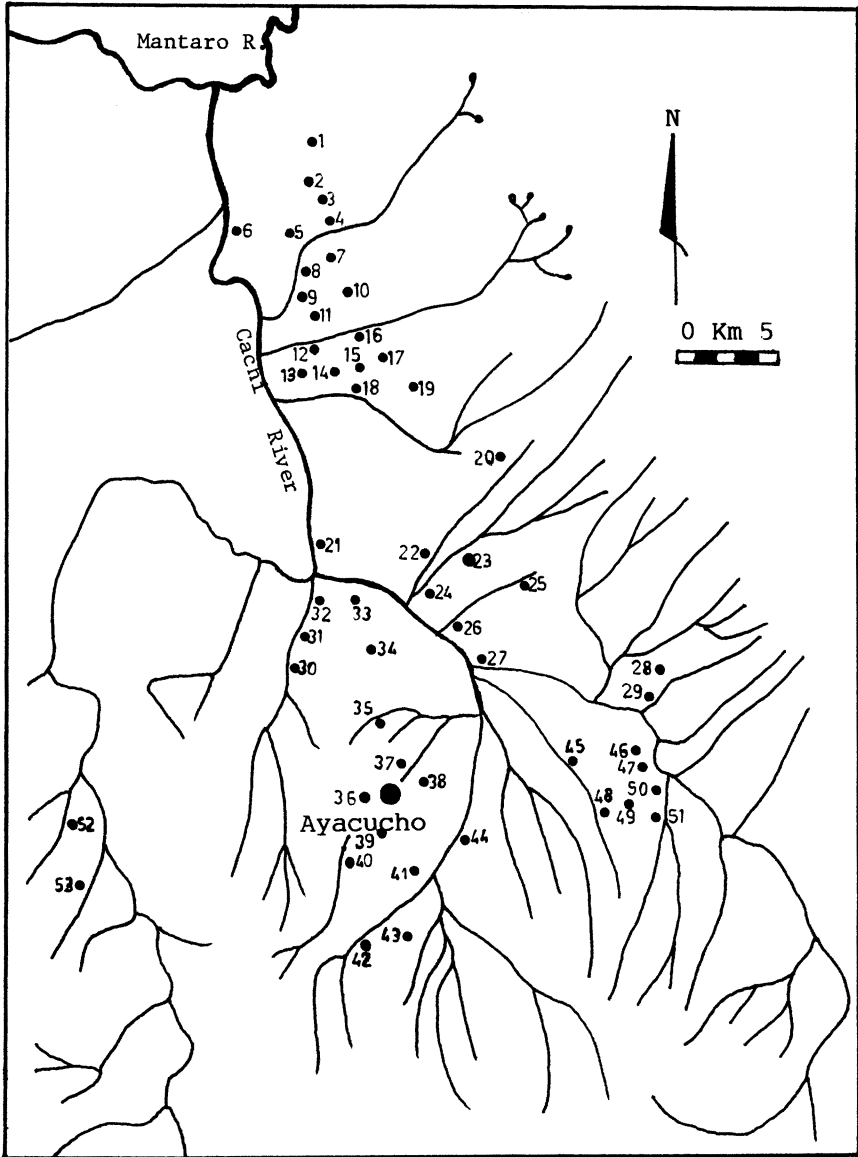


Figure 2. Main Huarpa Sites of the Ayacucho Valley

1. Killas, 2. Pampay I, 3. Pampay II, 4. Lucmapata, 5. Tantawasi, 6. Tororumi, 7. Iribamba I, 8. Iribamba II, 9. Iribamba III, 10. Porvenir, 11. Quinrapa, 12. Wansa, 13. Pachiaq, 14. Qala Orqo, 15. Kuchiwarkuna, 16. Tukoq Orqo, 17. Barriendos Pata, 18. Alaw, 19. Apacheta, 20. Pukaraypampa, 21. La Compañía, 22. Pacaycasa, 23. Wari, 24. Wayllapampa, 25. Ayapata, 26. Churucana, 27. Qoriwillka, 28. Qochpapata, 29. Acosvinchos, 30. Tanta Orqo, 31. Trigopampa, 32. Simpapata, 33. Lagunilla, 34. Trigoloma, 35. Mollepata, 36. La Picota, 37. Muyo Orqo, 38. Conchopata, 39. Rudaqasa, 40. Acuchimay, 41. Ñawimpukyo, 42. Chupas, 43. Solar Moqo, 44. Watatas, 45. Tambobamba, 46. Tambillo, 47. Kusibamba, 48. Kumun Moqo, 49. Velazques, 50. Wichqana, 51. Tuti, 52. Waripirqa, 53. Ñawpas.

which valley inhabitants responded in kind. If the above model is correct and assuming that agricultural activities were also pursued during the rainy season, it is likely that the pre-Wari inhabitants of the Ayacucho Valley were also part-time specialists. Although no Warpa site has been recognized as a pottery-making settlement, ceramic production probably was practiced during the dry season, as occurs in Huayhuas today. Besides being a necessary product for local use, pottery could have been another product for exchange. In this context, when Arnold (1993:69) states, "If [Quinua] potters lived outside of their present ecological zone, they would experience difficulties in carrying out both agriculture and pottery production," he seems to be missing the point. Agricultural societies such as Warpa appear to have developed agricultural and pottery production on a seasonal basis, and this seems to also be the case at Quinua.

According to the model built by Arnold (1993:212–13), climatic deterioration, the increase of marginal agricultural land, and population pressure may have resulted in the establishment of urban centers in the Ayacucho Valley. The same factors may have also favored the presence of full-time potters. Furthermore, Arnold suggests that the abandonment of Ñawimpukyo⁶ and other Warpa sites was due to the climatic deterioration. While he argues that during a period of climatic deterioration, sites like Ñawimpukyo were abandoned as populations moved toward lower zones, a mobilization in the opposite direction would be expected, since lower zones are drier than higher zones (Arnold 1993:214); but this is not the case. An agricultural society, such as Warpa, would have looked for other zones where agriculture could still be practiced. I do not rule out that climatic deterioration may have been a factor favoring the intensification of pottery production in this valley. However, according to the archaeological data, at the beginning of the Middle Horizon period (c. A.D. 600), whether due to climatic factors or not (Isbell and Cook 1987), population movement in the Ayacucho Valley did occur, but it was not from the lower zones towards more humid higher zones; rather, it was mostly horizontal. As Isbell and Schreiber (1978) show, Wari sites are located in almost the same ecozone as earlier Warpa sites. Political forces, rather than ecological factors, appear to be responsible for the relocation of the inhabitants of the Ayacucho Valley into fewer but larger sites, in contrast to the more numerous but smaller sites of the Warpa period.

For the Middle Horizon, only two pottery-making communities have been found in the entire Ayacucho Valley. These are Conchopata (Pozzi-Escot 1985, 1991; Pozzi-Escot and Córdova 1983) and Aqo Wayqo (Alarcón Guerrero 1990). Both sites are located near the modern city of Ayacucho (see Figure 1), in the lower montane savannah ecological zone (see Pozzi-Escot, Alarcón, and Vivanco 1993:fig. 11). Meanwhile, archaeological excavations carried out at the Wari site (Benavides Calle 1979, 1984, 1991; Bragayrac Dávila 1991; Bragayrac Dávila and González Carré 1982; Brewster-Wray 1983; Flores Sulca 1982; Isbell 1984; Isbell, Brewster-Wray, and Spickar 1991; Valladolid Huamán 1983) have not found conclusive evidence of pottery production. Unless future studies show that pottery was made at Wari, the idea that pottery was produced at this site must be rejected.

Studies carried out at Conchopata have demonstrated that this settlement was largely oriented to pottery production, particularly during the so-called Middle Horizon 2 in Menzel's (1964) scheme. The evidence found by Pozzi-Escot (1985, 1991) indicates that massive pottery production occurred there, as suggested by the recovery of ceramic molds (Pozzi-Escot and Córdova 1983). Besides domestic vessels, fancy and elaborate pottery was also produced at Conchopata. These are the large decorated vessels most likely used for ceremonial purposes (see Cook 1987); indeed, these big vessels may have contained *chicha* used during religious activities (Isbell and Cook 1987). Considering the closeness of Conchopata to Wari, it is likely that its inhabitants and those of Aqo Wayqo supplied pottery to the residents of Wari (see Pozzi-Escot, Alarcón, and Vivanco 1993, 1994). If weather is an important factor for pottery production, both Conchopata and Aqo Wayqo probably were located in an ideal zone for pottery making.

However, archaeological studies carried out at Conchopata do not make clear when pottery production began.⁷ It is also still unclear whether the Conchopata potters were full-time specialists or only part-time specialists, as the modern Quinua and Huayhuas potters are. The settings of both Conchopata and Aqo Wayqo suggest that agriculture must have been an important activity. Conchopata was located in an area with direct access to agricultural land (east of the site) where irrigation was also possible. Indeed, some areas east of Conchopata are still irrigated for agricultural purposes in spite of the massive modern construction that has recently taken place. In the past, these areas probably also were important for agriculture. Likewise, west of Aqo Wayqo is a large area exhibiting massive terrace construction, indicating that farming was also practiced by the inhabitants of this settlement. Lumbreras (1974:135) suggests that terraces were constructed in the Ayacucho Valley prior to the establishment of Wari. If so, the inhabitants of Aqo Wayqo probably were only part-time pottery specialists. As today, lack of water during the dry season may have been a factor limiting agricultural activities and favoring pottery production as a complementary activity.

In short, archaeological evidence and the locations of Conchopata and Aqo Wayqo suggest that both sites were seasonally oriented to agricultural activity (rainy season) and pottery production (dry season). Therefore, while it has been assumed that at lower elevations than Quinua, such as at Wari, full-time ceramic production is possible, there is no concrete evidence in support of this view. The presence of very elaborate Wari pottery, for instance, does not necessarily indicate the existence of full-time potters during Wari times in the Ayacucho Valley, particularly when high-quality pottery can be produced by part-time specialists (Patrick Carmichael, personal communication, 1994). The elaborate Quinua pottery clearly suggests that, indeed, such part-time specialization was the case.

As already noted, the proximity of Quinua and Wari is crucial to Arnold's model. Arnold (1993:198) argues that "the closeness of modern Quinua potters to the great urban center of Huari suggests that modern potters may be descendants of those who abandoned the city during the latter part of the

Middle Horizon." This view assumes historical continuity, and to verify it, the archaeology of the Ayacucho Valley during post-Wari times must be evaluated. A review of Ayacucho Valley archaeology shows that the styles of pottery made in this valley have exhibited continuous change over time. With the exception of the late Early Intermediate and the early Middle Horizon periods, when pottery which may have been related to the formation and consolidation of a political administration in the valley was made (Isbell 1985, 1987), each period is characterized by a particular ceramic type. In addition, techniques and knowledge developed during a previous period were not always practiced during the following period, perhaps due to sociopolitical circumstances, as the case of post-Wari pottery illustrates. Indeed, had there been continuity in pottery production, the post-Wari pottery would have been much better developed than the previous Wari vessels, but that is not the case.

When Wari and other Wari centers of the Ayacucho Valley were abandoned by the end of Middle Horizon period 2B (c. A.D. 800), the settlement patterns of the region changed drastically. Sites located in the valley were abandoned in favor of higher ecological zones, especially the puna. There, most of the sites are located on the tops of mountains, in apparent defensive and strategic positions (Valdez 1993; Valdez and Vivanco 1994). At the same time, the kind of pottery that had been made in the valley during the Middle Horizon period disappeared. The post-Wari pottery is very simple and generally undecorated. With the decline of Wari, the production of fancy pottery in the Ayacucho Valley apparently also came to an end. Thus, archaeological evidence does not suggest continuity of pottery production and population distribution between the Wari and post-Wari inhabitation of the valley.

When the Inkas conquered this part of the central Andes, the area was populated by the so-called Chankas (González Carré 1979, 1992). Following the conquest, the Inkas depopulated the region in order to establish several *mitmaq* groups⁸ that came from different areas (González Carré 1992:124; Schreiber 1993:79–90; Stern 1982:20; Urrutia 1985); most of these immigrants settled around the new Inka center of Vilkaswamán, south of Quinua. As reported by Cieza de León (1967:163), Vilkaswamán, not Quinua as suggested by Arnold (1993:139), was the first Inka settlement established in the ancient core area of Wari (Stern 1982:20; González Carré 1992:123; González Carré, Cosmópolis, and Lévano 1981:35–37). Stern (1982) and Urrutia (1985) argue that the Ayacucho Valley was populated by the Acos and the Aymaraes *mitmaqs*. From the pottery made in the valley just prior to the Inka invasion, it appears that ceramic production was not as important then as in Wari times. Therefore, the suggestion that modern potters from Quinua perhaps are the descendants of Wari potters remains open to argument.

Because ancient Wari pottery has been found throughout almost all of modern Peru, Arnold (1985:96) suggests that there is a connection between Wari and Quinua potters, particularly since Quinua pottery is also distributed all over the world (Arnold 1993:139). Arnold uses this coincidence to support his ecological approach, as he argues that "Huari is located in an area of favorable

climate for full-time ceramic production" (Arnold 1985:95). Despite the facts that Wari was the capital of a conquest state (see Lumbreras 1975; Schreiber 1992) and that the wide occurrence of Wari pottery may have been the result of the existence of a dominant political organization in the Ayacucho Valley, it remains unknown whether the Wari administration distributed pottery from the Ayacucho Valley. Data from Maymi, a Wari site located in the Pisco Valley of the south coast of Peru, suggest that the Wari pottery found there was locally made (Anders 1990; Anders et al. 1994). This may have also been the case elsewhere. It is also important to point out that contrary to Arnold's model, the presence of Cajamarca pottery at the Wari sites of the Ayacucho Valley (see, e.g., Anders 1986:210) suggests instead that pottery was brought to this valley from other regions.

CONCLUSIONS

Arnold's (1975, 1993) approach to the pottery-making community of Quinua and its implications for the archaeology of the Ayacucho Valley appear to be problematic. While Arnold's central argument revolves around the setting of the modern community of Quinua and the ancient center of Wari, it remains to be demonstrated whether pottery was produced at the latter site. This does not exclude the possibility that Quinua and Wari, as well as other communities of the valley, are ecologically well situated for pottery production. Because Wari and Quinua are nearby, Mitchell (1976:26) also tried to make connections from the irrigation system of Quinua to the ecological adaptation of Wari; however, he stated that any assumption "must be verified by means of archaeological research." Mitchell's statement should also be applied to the case of pottery production. The archaeological evidence presented above does not support the idea of historical continuity between Wari and Quinua.

Because Wari is located at a lower elevation than Quinua, and assuming that the highly elaborated Wari pottery indicates the existence of full-time potters during the Middle Horizon period at Wari, Arnold (1993:205) suggests that at lower elevations climate does not limit the existence of full-time specialists. The Wari pottery-making settlements of Conchopata and Aqo Wayqo, both located at lower altitudes than Quinua, seem to support Arnold's explanation. However, archaeological data provide no evidence for full-time specialists during that period. Likewise, the location of the modern community of Huayhuas, also well below Quinua and Wari, indicates that pottery making in the whole Ayacucho Valley is only a seasonal activity, although this valley appears to be an ideal region for pottery production. The Warpa settlement pattern and the fact that pottery was produced during this pre-Wari period reinforces this conclusion.

One aspect of Ayacucho Valley pottery production that would be important to know (although difficult to determine) is when Quinua potters began making church models, bulls, and other elaborate ceramics. I am tempted to argue that the major production of churches and bulls in Quinua perhaps is related to the growth of the city of Huamanga, to the increase of tourism in Ayacucho,

and, therefore, to the decline of pottery production for domestic use, as well as to the decline of barter among the inhabitants of Quinua. Before this period, it is possible that Quinua potters made ceramics for local use in the Ayacucho Valley, as the presence in Huanta of nonelaborate pottery from Quinua indicates. Because some potters still distribute their products in the puna (Arnold 1993:138), it is likely that in the past they also distributed their products in other parts of the valley.⁹ Maybe the increase in the distribution of utilitarian Huayhuas pottery in the Ayacucho Valley is also related to the increase in the production of elaborate pottery for the nonlocal market in Quinua. If the above argument is valid, it is likely that pottery production in Quinua, as it currently is in Huayhuas, was developed to secure products from other communities by means of exchange. Because local agricultural resources are not varied, pottery was probably made and used as a complement of agriculture, and its exchange thus helped to diversify the diet. So, instead of trying to find a link between ancient Wari and modern Quinua potters, it would be more appropriate to study the role of the exchange of products in the Ayacucho Valley and the role of pottery in this exchange.

To conclude, ethnographic evidence from Huayhuas and archaeological data from the Ayacucho Valley challenge Arnold's ecological explanation of pottery production in Quinua. Current archaeological data strongly indicate that prior to Wari, the inhabitants of the Ayacucho Valley practiced both agriculture and pottery making, although they did not live in an environment similar to Quinua. Moreover, during the Middle Horizon period, the two Wari pottery-making communities were situated in lower ecological zones than Quinua, but there is no conclusive information regarding full-time pottery production then. As argued in this paper, the occurrence of pottery production during *chiraw* is related to the lack of water, which precludes the practice of intensive *michka*. In ancient times, it is likely that pottery production in the Ayacucho Valley was also only a part-time activity, restricted to the dry season. Archaeologists are still far from being able to determine whether there were full-time specialists during the Middle Horizon period, but the highly elaborate Wari pottery should not be seen as sufficient evidence to argue in support of full-time specialization. Finally, Wari cannot be viewed as a political force involved in pottery distribution until the clay and nonplastic components of Wari ceramics are studied, which, as Arnold (1993) points out, is not an easy task. Nevertheless, available information, such as that from Maymi, suggests that Wari pottery was made locally in places outside the Ayacucho Valley, while the presence of Cajamarca pottery in the Ayacucho Valley indicates that foreign pottery (as well as other goods) arrived in this valley, perhaps as provincial tribute to the state.

NOTES

1. I would like to thank my wife, Katrina J. Bettcher, who read several earlier drafts of this article and provided important suggestions to make my writing clear. Special thanks are also due to Patrick Carmichael for his comments and suggestions on an

early version of the article. Three reviewers and the editor of the *Journal of Anthropological Research*, Lawrence G. Straus, provided helpful comments and constructive criticism, which are greatly appreciated. However, I am alone responsible for the ideas presented here and for any shortcomings. Finally, I would like to dedicate this paper to the peoples of Ayacucho, from whom I always gain motivation and valuable anthropological data.

2. I write Wari (and Warpa) with *W* instead of *H* because in Runasimi, or Quechua, there is no use of *H*. Local archaeologists unanimously use *W*, and recently some North American scholars are also shifting from Huari (and Huarpa) to Wari (and Warpa) (e.g., Schreiber 1992). However, when I am quoting others, the original spelling is retained. For local names, such as Huamanga, Huamanguilla, Huayhuas, and Huanta, the *H* is used in agreement with local spelling.

3. During the weekly Sunday markets in Huanta and Huamanguilla, product exchange where the use of money is minimal can still be observed. Here, most inhabitants from puna communities reject selling their products, arguing that "I do not eat money." My latest observations took place in November 1996, and I began observing markets in the late 1960s.

4. Raw materials for ceramic production occur in the Huanta Valley, but the people who live there or nearby do not make pottery. However, because there are two Warpa sites near the area (Valdez 1985), it is possible that pottery was produced there during pre-Wari times. This is not agriculturally marginal land.

5. Farmers from Luricocha supply a diverse variety of fruits to the inhabitants of Huanta and Huamanga. If the area were "poor for agriculture," it would be impossible to find such dense vegetation formed mainly by fruit trees, such as *pacae*, *lucuma*, *abocato*, *chirimoya*, and even bananas.

6. Recent archaeological excavations carried out at Ñawimpukyo by Nelly Machaca (personal communication, November 1996) indicate that this site continued to be inhabited during Wari times.

7. Warpa pottery occurs at the lower levels of Conchopata. However, whether pottery was produced during this time period remains unknown.

8. *Mitmaq*, or *mitmaqkuna*, were ethnic groups resettled in some areas of the empire, usually to increase agricultural production for the state (see Patterson 1991:77).

9. In his earlier work, Arnold (1972:871) observed that "utilitarian ceramics are sold and distributed by the potters themselves within the valley." In addition, he noted that "exchange of pottery on a purely independent basis in the puna and adjacent areas [was practiced]," while in Huamanguilla he also observed pottery exchanged for coca (Arnold 1972:870). In his recent book, Arnold (1993:131–32) also indicates that prior to 1967, subsistence crops sometimes were exchanged for pottery in Huamanguilla. This situation suggests that Quinua potters initially produced ceramics for exchange, which later declined just as the practice of exchange of other products is declining in the valley.

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