



Cultural Primacy of Tiwanaku in the Development of Later Peruvian States

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INTRODUCTION

Tiwanaku is an important economic, political and religious center, but because it is outside of Peru, where the most foreign research has been conducted, it is not accorded the credit it ought to receive. Several recent analyses including some in this symposium, have sought to downplay its importance, and to credit various exogenous factors for the development of the Tiwanaku florescence between ca. A.D. 400 and A.D. 900. It is against this background that I want to discuss four different current proposals for the origin of the Middle Horizon polities: a) that Wari developed as a response to deteriorating environmental conditions; b) that Wari owes no direct heritage to Tiwanaku, but rather develops from a common ancestor culture (often given as Pucara, but sometimes also credited to the Kallawaya); c) that Titicaca area *mitmaquna* pre-date Tiwanaku, and are to be found in Northern Chile and Southern Peru as early as 500-200 B.C., and thus Tiwanaku is a logical development or outgrowth of this core-periphery political system; and d) that *mitmaquna* are relatively late in the Titicaca area, and are in fact a Tiwanaku borrowing of an earlier Wari economic institution. Briefly I want to discuss some of the strengths and weaknesses of each of these four hypotheses.

Wari development as drought-driven

The basis for the drought-related argument in some respects goes back to Wittfogel's "irrigation civilization" theory. In some scenarios, Wari brings an agricultural crisis on through overpopulation; in others, such as Isbell (1973), deteriorating environmental conditions result in agricultural short-fall. Establishment of linkages between Nasca and Ayacucho, and the development of a managerial elite to organize production and oversee distribution of subsistence goods (as well as to regulate access to sumptuary goods) led to natural growth, the outcome of which was the Wari state. This short summary does not do justice to the elegance of the arguments and reconstructions given, but gives enough of a background to indicate that this model is predicated on the existence of a significant deterioration of agricultural productivity about A.D. 400 to 500.

Droughts are cyclical in the Andes; as well there have been longer cycles of warmer or cooler periods. Climatic deterioration thus would be the most obvious cause of a marked decline in agricultural productivity at about A.D. 500. The question then: is there evidence of such a climatic shift?

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Paulsen (1976: 125) summarizes evidence for a significant drought on the coast of Peru about A.D. 600 to 800, or approximately the period of the Wari state. However, climate in the Andean sierra zones is regulated by Atlantic tradewinds, while the Ecuadorian and Peruvian coast climatic regimes are dominated by the Pacific trade winds. Thus we cannot simply extrapolate from the Peruvian Middle Horizon coastal cultures to the highland environment.

Table 1 summarizes the evidence available for the Central Andes. There are a number of pollen profiles from bogs in Chile. These pollen profiles are not particularly relevant for sierra climate reconstructions because weather in southern Chile is influenced by the Pacific wind and currents, while the sierra weather are dominated by Atlantic tradewinds. There is only one relevant pollen profile from the central sierra (Schoenwetter 1973), but there are glacial sequences of retreats and advances and there are vegetational series from the Amazon areas immediately to the east from whence the precipitation derives, which will allow appropriate generalizations. Glacial advances have often been argued to be associated primarily with cooler temperatures (for example Wright 1980: 254; Hastorf 1983: 44). However, in the central Andes, glacial advances and retreats appear to be more closely correlated to periods of increased or reduced precipitation (Sánchez and Kutzbach 1974: 131; Simpson 1975: 292; Thompson et al. 1979: 1243). Thus glacial retreats may be provisionally correlated with periods of reduced precipitation in the central Andes, the periods of drought that we are seeking. In addition, studies of pollen profiles from Amazonia can provide further supporting information. As the Atlantic tradewinds which give rise to precipitation in the Andes must first cross the Amazon basin, evidence of increased or decreased precipitation in Amazonia will also reflect periods of increased or decreased precipitation in the sierra. The pollen profiles from Amazonia, however, are not temperature sensitive. They provide more information on precipitation than do on temperature.

Data from Table 1 can thus be utilized to test ideas about environmental impact

Table 1
ALTIPLANO CLIMATIC SHIFTS FOR THE LAST 3,500 YEARS¹

Radiocarbon times ²	Precipitation ³	Temperature ³
1450-1250 B.C.	Drier	Cooler
750- 100 B.C. ⁴	Drier	Cooler
A.D. - 100- 200	—	Warmer
A.D. 450- 600	Drier	—
A.D. 600- 950	Wetter	Cooler
A.D. 1100-1450	Drier	Warmer
A.D. 1500-1700	Wetter	Cooler

¹El Niño/Southern Oscillation unusual wet periods on the Peruvian coast may be correlated with droughts in the sierra, at least for the most severe excursions. Rasmussen (1985: 169, 175) notes that the major recent El Niño floods on the Peruvian coast correlate with droughts in Amazonia; and Thompson et al. 1984 notes that El Niño events are correlated with decreased precipitation in the sierra as well.

²Time intervals are given in radiocarbon years, not solar years. In addition, only those specific epochs for which we have evidence for either temperature or precipitation are given, thus the gaps in the sequence.

³"Wetter/Drier" and "Cooler/Warmer" indicate divergence from current average conditions.

⁴For the 750-50 B.C. period, Eddy (1977) recognizes two specific cooler peaks: 750-650 B.C. and 450-350 B.C. These two peaks seem to be reflected in Amazonian rainfall data as well. The 750-50 B.C. period appears to have been significantly cooler than current conditions.

(Data synthesized from: Ab'Saber 1982, Absy 1982, Bigarella and de Andrade-Lima 1982, Bray 1974, Cardich 1982, Colinvaux et al. 1985, Eddy 1977, Heusser 1982, Mercer and Palacios 1977, Schoenwetter 1973, Servant et al. 1981, Thompson et al. 1985, van der Hammen 1982, Wright 1980).

on cultural development. For example, Kent (1982: 223, 234) used glacial retreat information to identify some possible environmental parameters resulting in cultural shifts at the site of Chiripa. With the finer scale chronology in Table 1, more specific proposals can be advanced. The evidence from both glacial retreats and tropical forest studies indicate a climatic episode of drier and cooler temperatures between roughly A.D. 450 and 700. While we cannot argue that climate is the sole factor in the emergence of the Wari polity, the suggestion that Wari suffered agricultural crisis due to a drought or major shift in the precipitation regime appears to be at least one necessary factor to consider.

In the Central Sierra, Cardich noted (1982: 17) that current cultivation limits are about 250 meters lower than the maximum limits during the Peruvian Early Intermediate Period and Late Intermediate Period. Schoenwetter (1973: 103) also noted strong evidence for a longer growing season at higher elevations during roughly the 14th to 16th centuries. Inspection of Table 1 confirms this pattern; in addition other climatologically-driven hypotheses relating to developments during Chavin and Inca periods are evident in the data.

Origin from Pucara or Kallawaya

The origin of Tiwanaku from Pucara is, in itself, not a new concept. However, the origin of Wari and Tiwanaku from Pucara, independently, without mutually influencing each other, is a new explanation. This variant of the hypothesis allows Wari to evolve independently, without any interactions. First proposed by John Rowe, this idea has been recently re-adopted by Anita Cook (1983). I am convinced, however, by the number of direct copies of Tiwanaku motifs into Wari, that Wari did in fact borrow from missionaries from the south of Lake Titicaca (if we abandon this idea, we then have the problem not only of explaining specific shared concepts, but we must also explain, just as Jomon fishermen wandered around with ideas for centuries to form Valdivia, how it is that Pucara ideas survived for four centuries or more in the Ayacucho area, without any explicit expression, to suddenly emerge to form the Wari religious substrate, with a format like that which had been continuously evolving in the southern Lake Titicaca basin).

Another idea which has periodically re-emerged, but which has always collapsed for lack of supporting evidence, is that of the Kallawaya herbalists, probable Pukina speakers from east of Lake Titicaca, being the basis for both the Aymara-speaking Tiwanaku polity and the Quechua-speaking Wari State. Most recently Isbell (1983) has advanced this, selecting two of the dates from the Tiwanaku-related site of Niño Korin, to support an argument for pre-Tiwanaku "Tiwanaku" origin in the selva. There are four radiocarbon determinations from Niño Korin: A.D. 355, A.D. 375, A.D. 755 and A.D. 1120. These date different artifacts: the A.D. 355 and A.D. 375 determinations date pharmaceuticals, and in conjunction with the other two assays, appear to indicate extended utilization of the area. Browman (1978: 334) noted that even earlier than Niño Korin is highland influence at the selva site of Sina, where Nordenskiöld observed half a dozen derived-Pucara or Pajano style (temporally equivalent to Tiwanaku II) monoliths, indicating that intensive and extensive sierra intrusions into the selva can be dated as early as A.D. 100 or 200. The assemblage of elaborate snuff trays (tabletas), snuff tubes, tube containers, fur pouches, textiles, wood mortar, etc., found at Niño Korin is very similar to the same assemblage of hallucinogenic complex materials found Tiwanaku-influenced sites on coastal Chile during A.D. 400-900. Julien (1978) and Saignes (1983) fairly clearly summarize the salient arguments regarding the relatively minor geographic distribution of Pukina speakers, and their possible relationship with Uru. I have a long paper in preparation, attempting to put to rest finally the repeated attempts to erroneously link Tiwanaku with Uru, or to have Pukina speakers as a major group interdigitated between Quechua to the north and Aymara to the south. Specifics will await that paper, but briefly let me remark that the evidence simply is not there to support either of these concepts.

Tiwanaku Coastal Evidence: Trade, Colonists or Conquest

One of the critical issues is our ability to recognize, from the pattern of archaeological evidence, the existence of an intrusive colony of the *mitmaqkuna* type as distinct from other evidence of interaction such as conquest and incorporation, or intensive trade. Gonzalez (1983) has raised this question for the Inca occupation of Northwest Argentina. He points out that there are no important Inca temples or shrines south of the Aymara area, and that the pattern of Inca colonization in Northwest Argentina is substantially different from the pattern in Ecuador or Bolivia. Inca colonialization of Northwest Argentina was, he argues, almost exclusively extractive, to secure access to metal ores and other important sumptuary goods only, thus the Inca had little investment in the area, and concomitantly less impact on the local cultures. The question is: without the sixteenth century literature, would we recognize this as part of the Inca empire based only on the archaeological patterns of distribution of materials? By extension, what implication does this have for interpretations of pre-Inca Andean polities?

Imperial Inca pottery is standardized to the point that it is easily identifiable throughout the Andes, and in a general sense, is the same from Ecuador to Argentina. Such standardization is one of the hall-marks of "empire"; thus Roman sites in Germany or England or Libya can be instantly recognized by the occurrence of Roman ceramic items. Similarly we can identify Inca sites. As we extend this kind of pattern recognition, substantiated in both the Inca case and the Roman case by written historical records, backward to prehistoric political hegemonies such as the Wari and Tiwanaku, we need always to keep in mind the fact that this is an archaeological hypothesis, which needs to be tested each time, rather than an immutable archaeological truth.

"Saxamar" and "Chilpe" are two late wares in the southern Andes which are distributed in patterns less easily ascertained, which can be employed again to test some of our ideas of colonist vs. conquest vs. trade. These two wares were first defined for the Azapa area of Chile (Dauelsberg 1960), but have been employed to describe identical materials from southern Peru and Northwest Argentina as well as elsewhere in northern Chile. Particularly diagnostic of "Saxamar" is the llamita design; both Chilpe and Saxamar are black on redware styles that are coastal copies or coastal tradepieces deriving from the Titicaca basin Chullpa (Ryden 1947) or Collao Black on Red ware (Tschoepik 1946), which are characteristic of the Paqajes, Lupaqa and Carangas Aymara areas. Hence such wares are indication of either highland colonists, or of highland conquest or trade. In the Arica-Tacna area, we have substantial historic evidence of Aymara *mitmaqkuna*; hence at least in these areas of extreme southern Peru and extreme northern Chile, the Saxamar and Chilpe wares along with architectural evidence (and historic sources) can be used to identify intrusive Aymara *mitmaqkuna* settlements (see, for example, Trimborn 1975, Trimborn et al. 1975).

Chilpe and Saxamar wares, however, were spread both through such *mitmaqkuna* and the mechanisms of trade and conquest. In Region I of the Chilean north coast, Chilpe/Saxamar wares are found at Sabaipugro, Camarones, associated with an A.D. 1235 date, at the Pica and Quillagua oases at an estimated date of A.D. 1000-1250, at Pica-8 with an isotopic fractionation corrected date of A.D. 1485, and elsewhere at sites such as Isluga in non-Incaic contexts (Browman 1983). In Region II of the north coast, Chilpe/Saxamar ware is found at Caleta Huelen, Loa, in the Dupont complex, dated A.D. 1300-1480, and in the Lasana IV complex of the Loa, dated A.D. 1000-1480 (Browman 1983) and it is also found in non-Aymara sites in southern Bolivia of this late period, such as Laguna Hedionda (Barfield 1961: 99). The occurrence of Saxamar/Chilpe ware in most of these contexts relates not to colonists, but to trade, highland-highland, and highland-coast, a trade which still persists in a limited fashion to this day.

Saxamar/Chilpe ware, however, also was spread south during the Inca conquest. It is found in tambos along the Inca roads in Chile (for example, Hyslop and Rivera 1984), and

it is found further south in Argentina. Bregante (1926, Fig. 350) illustrates an example from the Pucara de Tilcara, Humahuaca, also referred to by Gonzalez (1984: 360); Gonzalez (1983: 356) reports it at Cortaderas/Payogasta/Incahuasi; and Pollard (1979) reports it from La Puerta, Calchaqui. In these cases, the occurrence of Saxamar/Chilpe ware appears to be related to the Inca conquest, presumably spread by Aymara soldiers or administrators in service to the Inca. One caution: with the occurrence of Ilamita ware in the non-Aymara Lipez area as trade-related material in pre-Inca periods, cases such as the Pucara de Tilcara example need to be carefully documented to ascertain whether we have an isolated pre-Inca trade piece, or an item dating to the Inca occupation. Nonetheless it is clear that in parts of north Chile and Northwest Argentina, the occurrence of Saxamar/Chilpe ware is due to its spread under the Inca conquest.

We have here a situation where the same ceramic materials relate to three different sociopolitical patterns: intrusive colonization; mutual economic interchange; and incorporation in a conquest state. Much of our argument for the development of the Wari and Tiwanaku polities is based on ceramic evidence. Can we discriminate between these three patterns? Have we been erroneously lumping as part of the Wari conquest state or the Tiwanaku religio-economic federation geographic areas which were actually not included? The answer to both of these questions is, I believe, "Yes". For the problem of including areas on the basis on only isolated ceramic pieces, see for example my comments on Cajamarca and Moche (Browman 1984). The focus of this discussion, however, has been on the evidence in the southern Andes. I suggest that the patterns occurring in Saxamar/Chilpe can be extremely useful for developing models and tests to distinguish these three different kinds of highland interaction with the coast. i): In terms of *mitmaqkuna*, we ought to expect the kind of evidence found at Sama (Trimborn 1975, Trimborn et al. 1975 for example) or as abundantly reported by our colleagues working in the Arica-Tacna area, where the ceramic evidence is backed up with distinct architectural, burial, and other patterns clearly co-existing and contemporaneous with on-going indigenous local settlements. ii): In terms of conquest, with the kinds of patterns found in the Inca tambos and Inca administrative centers in North Chile and Northwest Argentina, the pattern should be one where the altiplano wares are found only in relation to sites of the conquest state. iii): In terms of trade, the distribution of Saxamar/Chilpe in Region I and II of Chile is useful. With respect to this latter case, the distribution of Taltape/Mallku/Hedionda wares in North Chile, if used in conjunction with the distribution pattern of Saxamar/Chilpe, can be utilized to define a clearer type of trade patterning.

The Taltape/Mallku/Hedionda pattern links the non-Aymara Lipez area of the Bolivian altiplano with the North Chilean coast, the linkage being exclusively one of trade. Region II of Chile, particularly the Rio Loa and San Pedro de Atacama areas, has a number of sites which have examples of late altiplano trade wares. They are most frequently identified as "Huruquilla" or "Hedionda" wares; but "Hedionda" has been but poorly described, and the Uruquilla are an Aymara-group, while the original type collection for Huruquilla ware is a non-Aymara Chichas culture site. Arellano and Berberian (Arellano and Berberian 1981, Berberian and Arellano 1980) have described a new complex, well-excavated and well-documented, for the southern Altiplano area of Lipez, named Mallku; the Hedionda and sometimes mis-named Huruquilla pieces from Chile are clearly part of this complex. In Chile, Dauelsberg (1984: 39) has also recognized the need to clearly define this trade ware, and has identified it as "Taltape" ware, which he believes can be first found in association with Maitas cultural materials, which would place its first occurrence about A.D. 900-1000 (Dauelsberg 1984: 39), about the time of Tiwanaku V influence in this area. At the Type-site of Hedionda in non-Aymara southern Bolivia, some Ilamita trade ware of Saxamar/Chilpe cultural assemblage also occurs; the two are contemporaneous late (ca. A.D. 1000 to 1450) altiplano ceramic styles. Outside of the Arica-Tacna area, both Taltape/Hedionda/Mallku and

Saxamar/Chilpe have the same sort of distribution pattern. Analysis of these late Bolivian altiplano styles as they occur in Chile thus has given us some specific distribution patterns to look for in our quest to ascertain if the Tiwanaku materials occurring on the Pacific coast are evidence of Tiwanaku conquest, intrusive Tiwanaku colonists co-existing with other local cultural groups, or simply robust trade. We can similarly look at the distribution patterns of earlier altiplano ceramic styles as they occur on the coast to see if we believe them to be evidence of pre-Tiwanaku colonists, or if they instead represent earlier extensive trade networks.

In Chile, we have two different patterns of Tiwanaku influence: one characteristic of the Azapa valley, and the other the Río Loa/San Pedro de Atacama area. In the Azapa area, there is some evidence of pre-Tiwanaku contact with the Titicaca basin, not only in terms of highland agro-pastoral products, such as quinoa, potatoes, llama and alpaca wool goods, but also in terms of some specific highland motives found on the textiles, which are similar to Pucara (Focacci Aste 1983; Mujica, Rivera and Lynch 1983), but which also bear specific correlations with the Tiwanaku II - contemporary sculpture style defined as Pajano (Browman 1978). While Rivera has suggested that this may represent the first evidence of sierra *mitmaquna* (and a similar suggestion has been made for the early Pucara-contemporary materials in the Moquegua valley in Peru), the pattern of distribution of material thus far discovered and described is that of trade (i.e. like the trade patterns in later periods for Taltape/Mallku and Saxamar/Chilpe wares).

Substantial Tiwanaku influence begins to be found in the Azapa valley as early as the Cabuza phase (ca. A.D. 380-700), is clearly present in the Maitas phase (ca. A.D. 730-1000), and continues in a much modified form in the subsequent San Miguel and Gentilar phases. The Cabuza phase is contemporaneous with Tiwanaku IV in the highlands, which is roughly dated A.D. 375-750, and the Maitas phase is co-eval with the subsequent Tiwanaku V phase. Early penetration was trade-based, but there is evidence by some point in the Maitas period that actual Tiwanaku colonies may have been established in the Azapa valley. Evidence reviewed by Bittman (1980) and Muñoz Ovalle (1983a, 1983b) parallels my own interpretations (Browman 1980) of the initial Tiwanaku IV penetration being trade-based. The economic resources of the Azapa area continued throughout subsequent periods to be the dominant foci of sierra influence, although at some point this appears to have changed from extensive mutual trade interaction to more direct exploitation via highland *mitmaquna*. In this respect, the Azapa area displays a significantly different pattern of Tiwanaku traits than does the San Pedro de Atacama area to the south.

Muñoz Ovalle (1983a: 8) argues that Tiwanaku broke an earlier Alto Ramírez hegemony on the coast, thus resulting in the closer ties with the Titicaca basin, and the demand for prestige goods being from the high status Tiwanaku area. But Focacci Aste (1983), Berenguer, Castro and Silva (1980), and Browman (1978) point out that the pattern of Tiwanaku prestige goods in the Azapa area is quite different than that of the San Pedro de Atacama area. The Azapa/Arica area Tiwanaku materials include the four-cornered hat, the hallucinogenic complex (but limited to wooden snuff spoons and snuff tubes, with very few tabletas), wooden boxes, Tiwanaku ceramics (keros, pucos and retratos), trophy heads, and textiles. The goods from Azapa have a substantial socio-economic component, and in contrast to San Pedro de Atacama, have little of the "magico-religious" (Bergenguer et al. 1980: 90) Tiwanaku component. This San Pedro assemblage includes items of the hallucinogenic complex, but with substantial emphasis upon snuff tabletas, in contrast to Azapa, as well as a series of representations of Tiwanaku cult figures such as the most popular "sacrificador" as well as felines, raptorial birds, the Gateway of the Sun central figure, winged zoomorphic and anthropomorphic motifs, and so on, and includes in addition renditions of these figures in sumptuary goods such as gold keros. For llama trade caravans, it is a three-month round trip from Tiwanaku to San Pedro; thus bulky

commodities would not merit transport, but small portable status validating sumptuary goods could be economically transported. San Pedro served as a major "port of trade", not only a focal point for Tiwanaku goods but also for its own interactions with Northwest Argentina (Berberian 1977: 176; Berenguer 1984: 12; Browman 1980, 1983, 1984; Pollard 1984). In this case, the pattern of distribution of goods indicates two different type of economic interaction between the Lake Titicaca Tiwanaku folk and the coastal Chilean cultures.

There is evidence to suggest that Tiwanaku followed up on its initial heavy trade in bulky commodities in the Azapa/Arica area with the subsequent establishment of more direct control —not by conquest or incorporation into the state (as did its northern counterpart, Wari), but through the establishment of highland colonists in the Azapa valley. Rivera (Mujica, Rivera and Lynch 1983) points out that the 24 identified Tiwanaku period sites in Azapa initially were in ecozones not utilized by the local coastal settlements, and particularly focussed in the mid-valley area. This is precisely the patterns that the Programa Contisuyu personnel have identified for Tiwanaku colonists in the Moquegua valley (Robert Feldman, personal communication). In addition, Muñoz Ovalle (1983b: 89) identifies the appearance of combat weapons, burials with wounds and fractures received in battle, and there are some reports of fortifications being built at this time as well (Browman 1983, although Thomas Lynch, personal communication, May 3, 1985, suggests that the architecture of these two sites represents something other than fortification). New elements appear, especially the warrior with trophy heads and the "cult" of the human head, similar to manifestations seen further north on the Peruvian coast; altiplano religious motifs now appear, such as serpents, llamoid figures, etc. Thus there is evidence of possible armed control as well as priestly power; no longer is the evidence only one of mutual economic exchange. These colonies persist through the Tiwanaku V period, but subsequently direct control in this manner appears to be once again replaced by trade mechanisms alone (Lynch in Mujica, Rivera, and Lynch 1983: 99).

The Moquegua area may soon shed additional light on the nature of the highland Tiwanaku-coastal interface as well as the interface between Tiwanaku and Wari. Part of the issue revolves around the question of whether the Wari intrusion into the Moquegua valley at Cerro Baul pre-dates or post-dates the establishment of Tiwanaku colonists in the valley. I have argued, prior to the discovery of Cerro Baul (Browman 1980, 1981, 1984) that the Tiwanaku colonists moved into the Moquegua area after the collapse of the Wari state, predicated on the assumption that the collapse of the Wari state resulted in the loss of both agricultural goods and markets for the Tiwanaku polity. The Programa Contisuyu personnel (Robert Feldman, personal communication, February 23, 1985; Goldstein 1985) are leaning toward a model which would place Tiwanaku colonists in the area first, which would then have the Wari intrude into the area with the fortified site of Cerro Baul, and then would have Tiwanaku *mitmaquna* regain control of the area after the collapse of the Wari state.

Some Pucara or Pucara-derived ceramics have been reported from two locales in the Moquegua valley, and this is the basis of one argument for the very early establishment (by 200 B.C. to A.D. 200) of Titicaca basin colonist in the valley. This scenario would have such colonists established by Pucara contemporary polities, and thus the subsequent Tiwanaku, and later Estuquiña and Lupaca materials would, in this argument, be nothing more than a continuation of a pattern established by the earlier polities. I have not seen the Pucara material from Moquegua, but I would expect it to be of the same trade-related type of material as the contemporaneous artifacts found further south in the Azapa area of Chile. Highland-coastal interchange networks, which moved ceramic concepts and items as well as subsistence and sumptuary goods, are documented at least as far back as 1,000-800 B.C. (if not substantially earlier as Rivera argues). Thus it is not un expected to find some

Pucara-related materials in the middle Moquegua valley. The pattern described to date, however, supports only a trade-related origin for these pre-A.D. 400 materials.

The next issue is whether Titicaca basin colonists were established in Tiwanaku IV or Tiwanaku V. Goldstein (1985) reports Tiwanaku IV materials in his survey. However the illustrations he provided were all of Tiwanaku V (early) with possibly one or two late, late Tiwanaku IV items; thus the evidence I have seen to this point indicates substantial Tiwanaku influence does not appear prior to Tiwanaku V. Some of the Tiwanaku V material illustrated by Goldstein is post-Tiwanaku V collapse; thus we have the continuing problem of defining an appropriate interface between the Peruvian ceramic phases and the Bolivian ceramic units. There is a substantial Tiwanaku V presence in the area. I would not be surprised to find Tiwanaku IV materials in Moquegua, as I would predict that there was an initial increasing Tiwanaku trade presence in Moquegua, either directly, as now seems the case, or through Wari, as I had earlier hypothesized, much in the same fashion that we saw increasing Tiwanaku IV trade relations in Azapa shift to more direct resource control through establishment of *mitmaquna* in Tiwanaku V. The collapse of Tiwanaku led to a restructuring of the area, with new settlement types, new architecture, and new fortified hilltop sites, and with progressive regionalization, but continued direct altiplano *mitmaquna* being present (Stanish 1985; Goldstein 1985; Trimborn 1975).

The economic reason behind the establishment of greater control through colonists remains somewhat obscure. I had previously argued (Browman 1981) that Tiwanaku had lost access to coastal products (Such as maize, aji, marine products) with the collapse of Wari, and thus had moved into coastal areas to regain and insure continued access. This model, however, would not explain why *mitmaquna* were established in the Azapa valley. Moreover, Kolata (1982) has argued that the raised and ridged field system around Lake Titicaca, which is clearly pre-Tiwanaku in origin, provided sufficient agricultural production that Tiwanaku had a surplus of foodstuffs, and that trade to coastal regions for agricultural products would not have been necessary. In their discussion of the Wari intrusion, Cerro Baul, Lumbreras, Mujica and Vera (1982) emphasize the site as being an "enclave", with specific control of obsidian, turquoise, and lapis lazuli, and also suggest that its location close to the copper source of Cujajone may have been important as well. Control of minerals (metals as well as semi-precious stone) was important for the Inca presence in Chile (Hyslop and Rivera 1984) and in Northwest Argentina (González 1983) and sierra access to coastal minerals including copper and turquoise begins as early as Chiripa (Browman 1983, 1984). Control of either or both copper and obsidian sources in the Moquegua area may well be an important factor overlooked in the model building to this point. Obsidian from Tiwanaku is primarily of the Titicaca Basin type (Burger and Asaro 1977); Burger believes that the Titicaca basin type comes from the Arequipa area (Richard Burger, personal communication, April 21, 1980). Thus access to maize and aji may not have been the only important coastal resources; it may be that access to obsidian, copper, and other mineral resources was a significant factor. But it should be remembered that the location of the Tiwanaku V *mitmaquna* in the Moquegua valley is precisely in the same relative location as we found them in Azapa, that is in middle valley area, the most appropriate area for maize agriculture (Robert Feldman, personal communication, February 23, 1985).

East of Lake Titicaca, with the collapse of the Tiwanaku V polity, the Mollo Culture evolved. Recent researchers (Tapia 1984; Huidobro Bellido 1983, 1984) concur with Carlos Ponce Sangines that the Mollo culture evolved directly from the sierra Tiwanaku V colonists. Huidobro suggests another line of evidence for tracing intrusions of highland colonists into the selva in this area; 90 percent of the teeth of the burials of the early Mollo sites show the typical 4-cusp sierra molar pattern, rather than the 3-cusp pattern typical of the selva (Huidobro 1984: 155). There are sufficient similarities between the derived Tiwanaku Mollo culture and the derived Tiwanaku cultures west of Lake Titicaca that both Huidobro (1984:

155) and Portugal (1984: 118) have suggested that the cultures are part of the same ethnic group. There is enough local variation (Tschopik 1946, Stanish 1985) that specific regional variants can be isolated, but in general, this over-arching similarity indicates a general kind of Aymara continuity, from Classic Tiwanaku/Tiwanaku IV, through expansionist Tiwanaku V, and then into the regionalized post-Tiwanaku Late Intermediate period kingdoms.

CONCLUSION

An analysis of evidence from the southern Andes indicates that the Tiwanaku polity evolved separately from an Aymara-speaking population. Assessing the patterns of archaeological evidence from coastal sites, it can be demonstrated that the earliest sierra-coastal linkages, through Tiwanaku IV phase, are based solely on trade interactions. In Tiwanaku IV periods, more intensive economic, social and religious networks were established, resulting ultimately about A.D. 700, the end of Tiwanaku IV or early Tiwanaku V, in the establishment of sierra colonies in coastal agricultural zones, zones most appropriate for maize production. These colonists or *mitmaqkuna* are most closely linked to the sierra in Tiwanaku V times; the collapse of Tiwanaku V results in extensive regionalization, but highland polities still maintain some direct access through smaller multi-ethnic intrusive sites. The vertical ecology or archipelago model inherent in the *mitmaqkuna* approach appears to be earlier in Peru, and appears also to be very closely tied to the evolving Quechua life-style. It is my supposition, therefore, that the *mitmaqkuna* mechanism for exploiting multi-resources in stratified ecological zones, was first established in Peru, and came only later to the Tiwanaku area, no doubt through the Wari polity as intermediary. Cerro Baul remains a Wari enigma, an isolated enclave more than 100 km from the nearest known Wari settlement, a site possibly pre-dating the Tiwanaku exploitation of Moquegua. It may turn out to be our chronological Rosetta stone for finally working out the precise temporal relationships between the Middle Horizon epochs in Peru and the Tiwanaku phases in Bolivia.

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