

## Warfare and Engineering, Ostentation and Social Status in the Late Intermediate Period Osmore Drainage

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Bruce Owen

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**Abstract:** Models of cultural evolution often link the need for leadership in warfare or communal projects with the development of social differentiation. Yet when we compare indicators of warfare, large construction projects, and social differentiation for three archaeological cultures in the Osmore drainage of southern Peru, a very different pattern emerges. This counter-intuitive example highlights a problem with common interpretations of evidence for social differentiation, while suggesting new ways of looking at these and other cultures.

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In many models of the development of social complexity, an important factor that leads to the appearance of social hierarchies and elites is the need or potential for leadership in warfare or in management of large group projects (Adams 1966; Carniero 1970; Conrad and Demarest 1984; Earle 1987; Johnson and Earle 1987; Kirch 1984; Wittfogel 1957; etc.). People who are successful at leading raids, organizing defense, or marshalling labor for infrastructure projects may achieve special status and power, and may reify their success into permanent and even heritable positions of privilege. In this way, both warfare and project management are means of creating, legitimizing, and maintaining social hierarchies from simple chiefdoms to states.

One implication of this idea is that in cross-cultural comparisons, we should expect to find a positive correlation



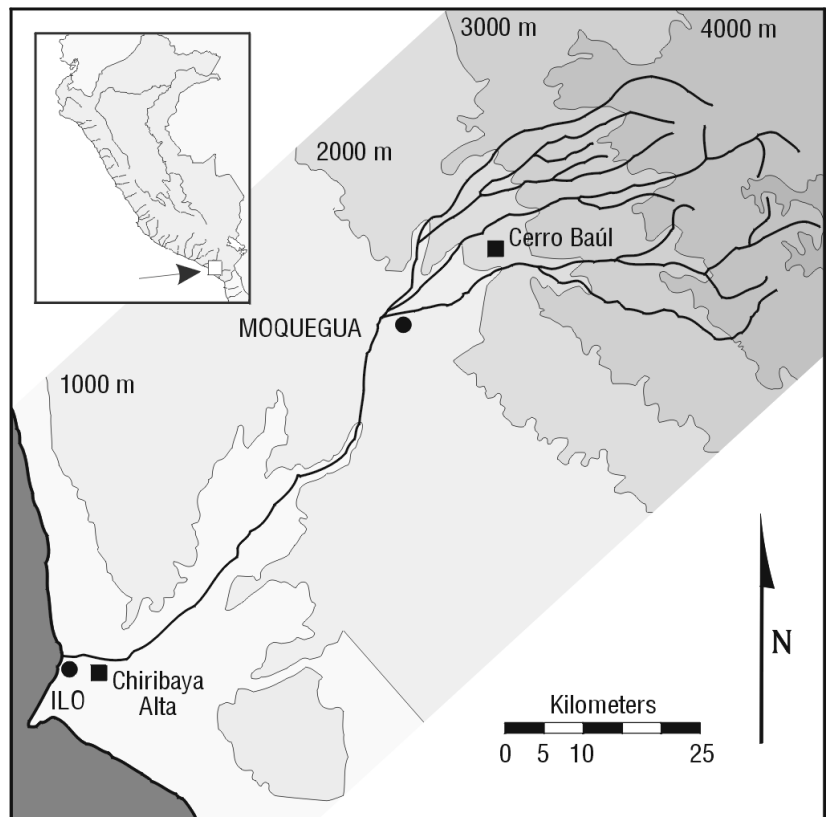
between the degree of warfare and/or group project management and the degree of social hierarchy. Societies which do not engage in warfare or manage group projects should generally have less elaborated social hierarchies, while those that frequently go to war and/or carry out large-scale, coordinated projects such as constructing long canals or circumvaling walls around settlements should generally have more developed hierarchies and elites.

Does this positive correlation of warfare and project management to social hierarchy necessarily hold? Let us consider a surprising test case from the Osmore drainage in southern Perú. The setting is a single, narrow river system on the far south coast of Perú. The subjects are three distinct cultures that flourished in partially overlapping times and places in this drainage during the Late Intermediate Period, starting after the collapse of the Tiwanaku state around 1000 AD, and running up to the Inka conquest of the region around 1476.

The earliest of these cultures is represented by the Tumulaca phase. The Tumulaca phase people were physical and cultural descendants of the Tiwanaku populace of the Moquegua region, dating from about 950 AD to around 1200 AD. When Tiwanaku collapsed, these inhabitants of the former state province split up into smaller, competing groups, and expanded from the Moquegua area both down to the coastal valley and up into the higher tributary drainages (Bermann et al. 1989; Goldstein 1989a,b; Owen 1993; Stanish 1985).

The second test case is the Chiribaya culture. The Chiribaya appeared in the coastal and middle elevations of the drainage probably very shortly after the Tumulaca phase began, either immigrating from the south, or developing from groups of the Tumulaca phase in a rapid, profound transformation. The Chiribaya shared the coastal and middle Osmore with the Tumulaca phase groups, but outlasted them, persisting to about 1375 AD (Jessup 1991; Owen 1993).

Finally, the Estuquiña culture developed in the middle and upper Osmore drainage a bit later, perhaps around 1200 AD, and persisted through the Inka conquest into early historic times.



There is little or no temporal overlap between Estuquiña and the Tumulaca phase, but the Estuquiña and Chiribaya did occupy the drainage contemporaneously for a time. Their territories did not overlap much, however, with almost all the Chiribaya population living at the elevation of Moquegua and below, and the bulk of the Estuquiña living at the elevation of Moquegua and above (Goldstein 1994; Stanish and Rice 1989; Owen 1994, nd).

These three cultures all existed within the 500 years of the Late Intermediate Period. They occupied a single coastal drainage in overlapping, albeit quite different territories. They were all part of Lumbreras's (1974) "tricolor del sur" ceramic macro-tradition. All three appear to have been organized as simple to complex chiefdoms, probably organized at the level of one to a handful of settlements. None is thought to have been part of a larger polity. These three cultures are a reasonably well-controlled set of examples for the cross-cultural comparison we are about to make.

The strategy for the comparison is to rank the three cultures relative to each other on three scales: intensity of warfare, amount of group project management, and degree of social differentiation and hierarchy. Fortunately, the three cultures differ markedly, and can be ranked on these scales fairly unambiguously. Using the three rankings, we will check whether or not indications of warfare and project management correlate with evidence of social hierarchy.

The rankings of the three cultures according to archaeological indicators of real or threatened warfare are shown in table 1. The numbers indicate a simple, unweighted ranking on each line of evidence, with 1 representing the lowest degree of evidence and 3 the highest. Ties are tallied as the lower ranking for both cultures.

	Tumulaca 950-1200 AD	Chiribaya 1000-1375 AD	Estuquiña 1200-1475 AD
Defensible site locations	2	1	3
Defensive constructions (walls, etc.)	2	1	3
Weapons	1	1	1
Traumas attributable to weapons	1	1	2
Total	6	4	9

Ranking on warfare, least evidence to most: Chiribaya → Tumulaca → Estuquiña

Table 1: Relative rankings on warfare

The first archaeological indicator of warfare is domestic sites in defensible locations. Almost all Chiribaya sites are on undefensible flats or lower hillslopes near valley bottom farmland. There is only one Chiribaya site that appears to be located for defensive purposes, Chiribaya

Alta, and that is a special, high-status residential and mortuary center that could well have been situated for reasons relating to status or ceremony as much as for actual defense. Many Tumilaca phase sites, especially those in the Moquegua area, are located high up on hillslopes, in inconvenient but defensible spots. With few exceptions, Estuquiña sites are located on top of isolated, high ridges or points, often surrounded on several sides by impassible cliffs and with access routes along just one or a few narrow ridgelines.

Not surprisingly, explicit site defenses such as walls, moats, gates, and so on, fall in the same rank order. Of all the Chiribaya sites known, only Chiribaya Alta is defended, with a shallow ditch and bank on which no evidence of a wall or palisade has been found. Once again, Chiribaya Alta is a special, high-status site that may have been enclosed for reasons other than literally military ones. Only one Tumilaca phase site, M11, is actually ringed by a wall, in this case a true mortared stone construction. However, other Tumilaca phase sites are protected by short freestanding walls and terrace retaining walls around parts of their peripheries, or crossing access routes up gullies. Finally, almost all Estuquiña sites are virtual fortresses, often with massive double circumvaling walls over two meters high, separated by an open no-man's land, and entered uphill through well-defended gates. Numerous Estuquiña sites can only be reached easily by walking along a ridgeline, and in these cases the ridgeline is often cut by up to three trenches as much as two meters deep, often with one or both sides supported by a vertical stone wall, forming an effective, moat-like barrier. At several sites, a mound or an elevated room outside the defensive walls controls passage along the ridgeline access route, and at one site, the outer defensive wall has a bank or step along the inside that allowed defenders to hurl projectiles at attackers from behind the protection of the upper portion of the wall. In short, Estuquiña sites were dramatically defensible.

The three cultures tie on their scant evidence of weapons. In the Tumilaca phase, weapons are virtually unknown in tombs, but a mace head and a high concentration of projectile points were found at the Tumilaca site of Loreto Alto. Some slings, bola stones, bows and arrows, axes, and maces are known from the hundreds of excavated Chiribaya tombs, but the sample is so much larger than that for the other cultures that it would be misleading to claim a greater frequency of weapons. A few slings, bola stones, and mace heads are known from Estuquiña burials. In fact, all of the putative weapons could have been used for hunting, herding, agriculture, or other peaceful purposes. The only relatively certain weapons reported for any of the cultures are a cache of 23 round throwing or sling stones found inside the defensive wall of the Estuquiña site of Colana (Stanish 1985), and these hardly warrant a higher ranking.

Finally, studies of human remains do not report traumas suggesting warfare among either Chiribaya nor Tumilaca populations (Burgess 1992). Stanish (1985) suggests, however, that several depressed cranial fractures from burials at Estuquiña may correspond to stones thrown by hand or sling.

To summarize these findings, we simply total the rankings and put the three cultures in order by the totals. This weights each type of evidence equally, which may not be fair. Nevertheless, the general pattern is so clear that the overall ranking of the three cultures for warfare would

probably not be contested by anyone who has worked in the region. Chiribaya comes first, with the least evidence of warfare, followed by Tumilaca with a low to intermediate degree of conflict, and finally by Estuquiña, which epitomizes the warlike pattern of the Late Intermediate Period across much of Perú.

Table 2 shows rankings for some measures of group project management. In this case, large, shared civil engineering works are taken to imply organized planning and deployment of labor. The defensive works tallied in the previous table could also be included, but there is no need to count them twice, since they only reinforce the same results.

	Tumilaca 950-1200 AD	Chiribaya 1000-1375 AD	Estuquiña 1200-1475 AD
Canals	2	1	3
Reservoirs	1	1	2
Agricultural terracing	2	1	3
Roads	1	1	2
(Site defenses; not included in total)	2	1	3
Total	6	4	10

Ranking on project management, least evidence to most: Chiribaya → Tumilaca → Estuquiña

Table 2: Relative rankings on large project management

There are only two significant known canals that might have been used by the Chiribaya. One, in the Otorá drainage, was about 3.5 kilometers long (Stanish 1985). The other, more impressive possibility runs 6.7 kilometers along the rugged north wall of the coastal Osmore valley. About 2.4 kilometers of this canal cross high, steep, rocky cliff faces, both supported by multiple mortared stone retaining walls and cut into the bedrock. This does not suggest a project that could be patched together by small, uncoordinated work groups. It is not certain, however, that the Chiribaya built this canal. Instead, it seems more closely associated with the Tumilaca population of the coastal valley, which may have originally built the canal and later shared it with, or ceded it to, the Chiribaya (Owen 1993). Other Tumilaca phase groups in the middle and upper Osmore drainage built long canals, such as a 7.4 kilometer canal off the Río Porobaya. Since this canal watered land that was cultivated by just 4 domestic units, some larger labor pool had to be tapped for its construction (Stanish 1985:54). Tumilaca phase people also rebuilt and reused abandoned Wari canals that were even longer and crossed even more difficult terrain. Clearly, though, the Estuquiña were the greatest canal builders of the three, constructing numerous long canals, several short aqueducts up to two meters above ground level, and at least two canals that crossed from one valley to irrigate fields in another (Stanish 1985; Owen nd).

Agricultural terracing, even with impressive stone retaining walls, may or may not imply large labor groups or significant coordination. Guessing that in some cases it does, the three test cultures fall in the same order when ranked by amount of agricultural terracing. The Chiribaya may have used some small terraces in the coastal Osmore valley. Tumulaca sites are clearly associated with larger patches of terracing in the upper Osmore drainage, especially in the Torata and Otoro valleys (Stanish 1985; Owen nd). Many Estuquiña sites are surrounded by huge areas of often uniform, regular terrace systems with straight, standardized feeder canals and shared reservoirs. These systems dwarf the earlier efforts of the Tiwanaku and Wari states, and suggest control and coordination of layout and construction details. Some of these terraces may date to Inka times, but I believe that the bulk of them were built by the Estuquiña.

Finally, some Estuquiña sites are interconnected by well constructed roads. Some of these roads may have been built or improved under the Inka, but it is also possible that the Estuquiña built their own road system, another large-scale project that suggests planning and control.

The overall ranking for group project management is identical to that for warfare: the Chiribaya show the least evidence of project management, the Tumulaca fall only slightly ahead, while the Estuquiña clearly show the most evidence of coordinated, large-scale, shared civil engineering projects.

	Tumulaca 950-1200 AD	Chiribaya 1000-1375 AD	Estuquiña 1200-1475 AD
Variability in grave goods	1	2	1
Variability in grave construction	1	2	3
Juvenile burials with large grave lots or special treatment (ascribed status?)	1	1	1
Variability in domestic room size, construction, finish, etc.	2	2	1
Quantity and elaboration of fancy status goods (ceramics, metals, textiles, etc.)	2	3	1
Special-purpose ritual (?) areas	1	2	1
Total	8	12	8

Ranking on social differentiation, least evidence to most: Tumulaca → Estuquiña → Chiribaya

or: Estuquiña → Tumulaca → Chiribaya

Table 3: Relative rankings on social differentiation or hierarchy

Table 3 shows the rankings for conventional archaeological measures of social differentiation or hierarchy. Perhaps the most-used measure of social differentiation is variability in grave lots. The limited sample of Tumulaca phase burials indicates only minor variability in number, type, and quality of grave goods (Owen 1993, i.p.), although higher-status Tumulaca burials may have been concentrated at another site. The much larger sample of Estuquiña burials also suggests minimal variability (Bürgi et al. 1989; Stanish 1985), although most of the burials that probably contained the highest-status dead have been selectively removed from the record because they were placed inside visible *proto-chullpa* and *chullpa* burial structures, virtually all of which have been looted. In contrast, Chiribaya burials are characterized by dramatic variability in grave goods, even within single cemeteries. The grave goods in Chiribaya burials range from a single plain, tattered shirt, to dozens of ceramics, ornaments and tools of copper, silver, and gold, highly decorated textiles, plant and animal food offerings, sacrificed camelids, and even human attendants. The largest Estuquiña *chullpas* were not big enough to hold the grave goods of the highest-status Chiribaya tombs, even if they had been packed to the roof.

In addition to grave goods, we can also consider variability in burial treatment or tomb construction. Again, the small sample of excavated and looted Tumulaca burials shows the least variation. Tumulaca dead were buried in simple pits, or in cylindrical, stone-lined cist tombs with most variation in size directly related to the size of the body. Chiribaya burials include simple pits, cylindrical stone-lined cists, several variants of partially or fully stone-lined rectangular tombs, and occasional tombs with low circular or rectangular walls on the surface above them. Although some of this variation may be chronological or geographic, many different tomb types occur in the same cemeteries. In addition, the size of Chiribaya rectangular tombs varies dramatically, and not always in accordance with the size of the body or the grave lot. Estuquiña burials include the simple pits and cylindrical, stone-lined cist tombs of the other two groups, but they also add some dramatic innovations: a modest fraction of cist tombs were marked by above-ground walls or squat platforms, in what Stanish (1985) calls the *proto-chullpa* form, while selected other burials were placed in fully above-ground *chullpa* burial towers up to over two meters tall. Stanish (1985) believes that these structures contained multiple burials that were repeatedly revisited, a treatment quite different from anything the Tumulaca or Chiribaya did with their dead.

Burials of infants or children with large grave lots is often taken to suggest a social system with ascribed status. All three cultures have evidence of such burials. One of the richest grave lots in the small Tumulaca phase sample was found with a small child (Owen 1993, i.p.). Numerous Chiribaya children were buried with large grave lots. Stanish (1985) notes that the bones of infants and children were salvaged from one partially intact *chullpa*, and other looted Estuquiña *chullpas* have bones of juveniles scattered around them (Owen nd). The three test cultures score a tie on this evidence.

Variability in the size, construction technique, and quality of construction of domestic structures is another indicator of variability in social status. Evidence for this type of variability at Estuquiña sites is minimal. Stanish (1985) reports one room group at Porobaya as being of

somewhat better finish and containing somewhat more exotic goods than other rooms, but the difference is small. Estuquiña sites give the impression of general homogeneity of room size and construction. In contrast, a small sample of Tumilaca phase rooms at Loreto Alto in the coastal Osmore valley showed considerable variability, from small one-room shacks on tiny terraces to moderately large multi-room houses on broad, centrally-located, artificially leveled platforms (Owen 1993). Chiribaya structures at Yaral (Garcia 1988), Chiribaya Baja, and El Algodonal (Owen 1993) show some variability, actually less than at Loreto Alto, but if we include the indications of very large domestic structures at Chiribaya Alta, then Chiribaya and Tumilaca sites have to be scored as having about the same degree of variability in domestic structure size.

Another indicator of social differentiation is the presence of a significant industry in fancy status goods. In Estuquiña domestic and mortuary contexts, there are few artifacts that would obviously have served as status markers, and even those are relatively plain and crude. Few Estuquiña ceramics are decorated, and the occasional painting or modelling is undistinguished at best. Estuquiña textiles are mostly plain, and when they are decorated, it is in natural colors of brown, cream, and black. There are a reasonable number of Estuquiña copper ornaments from tombs and midden samples, and even a few hammered gold ornaments that are either flat or decorated with simple rows or circles of repoussé dots. Nevertheless, these items are extremely scarce, given the large sample of Estuquiña tombs excavated. In contrast, the Tumilaca phase is marked by a well-developed tradition of decorated, polychrome pottery. Tumilaca phase textiles included not only the plain browns of Estuquiña, but also colorful embroidered decorations and fancy textiles with many stripes of brightly dyed colors. Metals were rare, but the mortuary sample is so small that the relative frequency of metals is hard to assess. The Chiribaya culture is well known for its enormous quantities of fancy status goods of such high quality that they imply the existence of highly skilled, specialized craftspeople. Chiribaya ceramics are often very well finished and highly decorated with polychrome geometric designs, and the density of decorated ceramics in Chiribaya mortuary and domestic contexts is far greater than in either of the other two cultures. Chiribaya textiles are decorated at least as often as Tumilaca textiles, probably more, and the decorations are more elaborate, most notably with bands of geometric or figurative designs far more intricate than the simple stripes and blocks of color on Tumilaca textiles. Finally, metals appear in Chiribaya contexts with a frequency comparable to or slightly less than that of the Estuquiña, but the technical and aesthetic sophistication of the metalwork is far higher. The Chiribaya hammered gold sheet ornaments like the Estuquiña, but their repoussé designs were much more elaborate; the Chiribaya made all the types of ornaments and implements that the Estuquiña did, plus many others; and the Chiribaya cast some copper-gold alloy objects such as elaborately decorated axe heads that were apparently far beyond the reach of Estuquiña metalworkers. Of the three cultures, the Chiribaya had by far the most sophisticated and prolific industries of decorated ceramics, textiles, and to a lesser extent metals.

One final, possible indicator of social differentiation is the presence of special-purpose ritual structures, in that these might imply a category of people with specialized ritual knowledge and potentially elevated status. There is no evidence for such structures in Estuquiña sites. Stanish (1985) reports one unusually well-constructed room at the Tumilaca phase site of P5 which had an intact ceramic *keru* beaker buried in the floor, apparently as an offering; this room may have



had some ritual purpose. Numerous Chiribaya sites have sunken rectangular patios reminiscent of the larger sunken courts of Tiwanaku temples (Owen 1993; Reycraft pers.com.). One excavated example at Loreto Viejo in the coastal Osmore valley had unusually well-constructed low retaining walls on all four sides, and the only prepared clay floor known from any Chiribaya site (Owen 1993). These sunken courts may have had ritual functions.

The overall ranking of the three cultures according to evidence of social differentiation is ambiguous, since the total scores for the Tumilaca and Estuquiña cultures are identical. One or two minor, reasonable changes could put them in either order; weighting certain factors more or less heavily could have the same effect; and people knowledgeable about the regional culture history could reasonably disagree on the ranking of these two cultures. But the important point is that the Chiribaya culture clearly stands out as having much more clear and copious evidence of social differentiation than the other two groups.

Now that we have ranked the three cultures on each of our three scales, does the hypothesized correlation of warfare and group project management with evidence for social differentiation hold up? In this case, no. The three cultures fall in exactly the same rank order on evidence of warfare and group project management, which suggests that these two scales may indeed reflect a single variable, possibly having to do with the need or capacity for leadership. The relationship of this variable to the evidence of status, however, is exactly opposite to what the theory predicts. The Chiribaya culture clearly had the least evidence of warfare and group project management, yet had the most obvious signs of social differentiation. The Estuquiña clearly had the most evidence of warfare and group project management, yet had an intermediate or trailing rating for social differentiation. The correlation, if any, is negative: the more evidence for warfare and project management, the less evidence for social differentiation.

It may be that the model in which warfare or group project management leads to social differentiation simply does not work in this case. If so, the seemingly common-sense model of warfare and management does not invariably apply, and we should look for the conditions that govern whether or not it fits any given case.

On the other hand, maybe the model *does* work, but we are misinterpreting the evidence. Most of the evidence used to evaluate social differentiation does not relate directly to real status and power, but rather to display, ostentation, and legitimization of position. There may sometimes be an inverse relationship between the reality and the appearance of power and status. When a leader really leads, as in the case of a military leader in times of war or a successful manager during a construction project, he (or she) may be recognized for his abilities and contributions, and may exercise his power and enjoy his status without the need for many archaeologically visible trappings. On the other hand, when a leader is trying to legitimize his role and maintain his status in the absence of a real need for leadership, he may surround himself with symbols of wealth and power, in order to set himself apart by ostentation and pomp.

If correct, this idea turns our view of the Osmore cultures on its head. The Estuquiña may have been the most stratified of all the groups, with leaders effectively coordinating defense and large

construction projects. In this contrarian view, Estuquiña leaders would have ruled on a Spartan model, effective, obeyed, visibly honored not so much in life as in death, when they were interred in enduring, visible monuments. The Chiribaya, living peacefully and with minimal infrastructural needs, were burdened with a useless, ostentatious elite continually defending their privileged status with ever more outrageous displays of wealth in life and wastefully excessive funerary offerings buried, no doubt with showy ceremony by the survivors, in their unmarked graves at death.

We have a problem here of how to measure social differentiation or stratification. We can believe that militarism and construction projects require strong leaders, but inferring an elite from evidence of warfare and project management makes the theory into an untestable postulate. On the other hand, equating obvious trappings of status with actual leadership and power confuses symbols with reality. There may well be an inverse relationship between the real power of elites and their need to reify their status with ostentatious display. This inverse relationship will never be complete, of course; elites must already have some real wealth or power in order to obtain their showy goods, and true leaders who do not take some degree of privilege from their position must be very rare.

There are two conclusions to be drawn from this cross-cultural comparison. First, we should be cautious in associating warfare and large project management with social differentiation. No matter how sensible it seems, the relationship might not hold. And second, we should be careful not to confuse the visible trappings of elevated status with the reality of power. It may be that some rich burials are cases of the lady protesting too much, while the true leaders sometimes walk modestly but carry big sticks.

## References

Adams, Robert McC.

1966 *The Evolution of Urban Society*. Aldine, Chicago.

Bermann, Marc, Paul Goldstein, Charles Stanish, and Luis Watanabe

1989 The Collapse of the Tiwanaku State: A View from the Osmore Drainage. In *Ecology, Settlement and History in the Osmore Drainage, Perú*, edited by D.S. Rice, C. Stanish, and P.R. Scarr. BAR International Series 545(ii):269-285. B.A.R., Oxford.

Burgess, Shelly D.

1992 Health at Algodonal: A Preliminary Report. Paper presented at the Society for American Archaeology 57<sup>th</sup> Annual Meeting, Pittsburgh.

Bürgi, Peter T., Sloan A. Williams, Jane E. Buikstra, Niki R. Clark, Maria Cecilia Lozada Cerna, and Elva Torres Pino

1989 Aspects of Mortuary Differentiation at the Site of Estuquiña, Southern Perú. In *Ecology, Settlement and History in the Osmore Drainage, Perú*, edited by D.S. Rice, C. Stanish, and P.R. Scarr. BAR International Series 545(ii):347-369. B.A.R., Oxford.

Carniero, R.L.

1970 A Theory of the Origin of the State. *Science* 169:733-738.

Conrad, Geoffrey, and Arthur Demarest

1984 *Religion and Empire: The Dynamics of Aztec and Inca Expansionism*. Cambridge University Press, New York.

Earle, Timothy

1987 Chiefdoms in Archaeological and Ethnohistorical Perspective. *Annual Review of Anthropology* 16:279-308.

Garcia, Manuel

1988 Excavaciones de Dos Viviendas Chiribayas en el Yaral, Valle de Moquegua. Tesis de Bachiller en Ciencias Arqueológicas, Facultad de Ciencias Histórico-Arqueológicas, Universidad Católica "Santa María", Arequipa.

Goldstein, Paul S.

1989a Omo, A Tiwanaku Provincial Center in Moquegua, Perú. Ph.D. dissertation, Department of Anthropology, University of Chicago.

1989b The Tiwanaku Occupation of Moquegua. In *Ecology, Settlement and History in the Osmore Drainage, Perú*, edited by D.S. Rice, C. Stanish, and P.R. Scarr. BAR International Series 545(i):219-255. B.A.R., Oxford.

1994 Informe de Campo: Proyecto Catastro Arqueológico del Valle de Moquegua. Report submitted to the Instituto Nacional de Cultura, Perú.

Jessup, David

- 1991 General Trends in the Development of the Chiribaya Culture, South-Coastal Perú. Paper presented at the Society for American Archaeology 56<sup>th</sup> Annual Meeting, New Orleans.

Johnson, Allen, and Timothy Earle

- 1987 *The Evolution of Human Societies: From Foraging Group to Agrarian State*. Stanford University Press, Stanford.

Kirch, Patrick

- 1984 *The Evolution of the Polynesian Chiefdoms*. Cambridge University Press, New York.

Lumbreras, Luis

- 1974 Los Reinos Post-Tiwanaku en el Area Altiplanica. *Revista del Museo Nacional, Lima-Perú* 15:56-85.

Owen, Bruce D.

- 1993 A Model of Multiethnicity: State Collapse, Competition, and Social Complexity from Tiwanaku to Chiribaya in the Osmore Valley, Perú. Ph.D. dissertation, Department of Anthropology, UCLA.

- 1994 Were Wari and Tiwanaku in Conflict, Competition, or Complementary Coexistence? Survey Evidence from the Upper Osmore Drainage, Perú. Paper presented at the 59<sup>th</sup> Annual Meeting of the Society for American Archaeology, Anaheim.

i.p. The Social Legacy of Tiwanaku in the Cemetery at El Algodonal. In *Bioarchaeological Studies in the South Central Andes*. Edited by J. Buikstra.

n.d. Informe del Campo and Informe Final: Inventario Arqueológico del Drenaje Superior del Río Osmore. Report to be submitted to the Instituto Nacional de Cultura. In preparation.

Stanish, Charles

- 1985 Post-Tiwanaku Regional Economies in the Otoro Valley, Southern Perú. Ph.D. dissertation, Department of Anthropology, University of Chicago.

Stanish, Charles, and Don S. Rice

- 1989 The Osmore Drainage, Perú: An Introduction to the Work of Programa Contisuyu. In *Ecology, Settlement and History in the Osmore Drainage, Perú*, edited by D.S. Rice, C. Stanish, and P.R. Scarr. BAR International Series 545(i):1-14. B.A.R., Oxford.

Wittfogel, K.

- 1957 *Oriental Despotism: A Comparative Study in Total Power*. Yale University Press, New Haven.