9. Reestablishment of Complex Societies following Collapse and Abandonment in Nasca, Peru

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Abstract: The Nasca region of Peru saw the rise, fall, and regeneration of complex societies over a period of 1,500 years. The Nasca Culture was the first civilization that developed in the region around A.D. 1, and it was ultimately incorporated in the Wari state around A.D. 650. However, a true collapse did not occur because there was not a breakdown in the political system leading it to become less complex. Instead, Nasca was integrated into a larger state, and new types of alliances, entanglements, and resistances were created. It was at the time of the Wari collapse around A.D. 900 that the disintegration of society occurred and resulted in the abandonment of the region. This collapse was facilitated by Nasca’s interconnectedness with the intrusive state and by continued environmental changes. After 200 years, the region was once again inhabited, and despite this severe disruption, there was a reemergence of society that was in some ways profoundly different and in other ways reflected earlier traditions. Local small-scale sociopolitical institutions were resilient and were key in revitalizing society. These included the irrigation and agricultural regimes that played an important role in the organization of social and economic relationships and in the creation of hierarchy. Pan Andean ideology and organization of family and community, specifically the ayllu, were also maintained and aided in the establishment of new settlements and restoration of society.

The Nasca region, located in the south coastal desert of Peru, saw the rise, fall, and reestablishment of complex societies over 1,500 years. During this

period, the region experienced the development of the first civilization (the Nasca Culture), conquest of that civilization by the highland Wari Empire, collapse and abandonment, resettlement and growth of local society, and conquest by the Inca (Table 9-1). The collapse of the Wari Empire brought about a particularly dramatic era in the prehistory of the region as it led to the abandonment of Nasca for at least 200 years. This was followed by the establishment of a transformed local society. The dynamics of this particular era in Nasca highlight the changing strategies societies and how they may reform after regional abandonment.

Table 9-1. Chronology of Settlement in the Nasca Drainage

<table>
<thead>
<tr>
<th>Horizon or Period</th>
<th>Culture Name</th>
<th>Approximate Date</th>
</tr>
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<tbody>
<tr>
<td>Late Horizon</td>
<td>Inca</td>
<td>A.D. 1476–1532</td>
</tr>
<tr>
<td>Late Intermediate</td>
<td>Tiza</td>
<td>A.D. 1000–1476</td>
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<tr>
<td>Middle Horizon</td>
<td>Wari, Loro</td>
<td>A.D. 650–1000</td>
</tr>
<tr>
<td>Early Intermediate</td>
<td>Nasca Culture</td>
<td>A.D. 1–650</td>
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<tr>
<td>Early Horizon</td>
<td>Paracas, Proto-Nasca</td>
<td>800 B.C.–A.D. 1</td>
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<td>Initial</td>
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<td>?–1800 B.C.</td>
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Cycling of complex societies is a phenomenon found in most areas of the world. The rise, collapse, reorganization, and expansion of civilizations can be seen as a common process (e.g., Marcus 1998; Schwartz and Nichols 2006; Yoffee and Cowgill 1988). Collapse has often been thought of as the destruction of a society, but really it is more specifically the dissolution of the political system (Yoffee 1988:18). Following the breakdown of a political system, it is unusual for a society to completely disintegrate; instead, societies usually splinter and become organized on a less complex scale. The collapse of empires is particularly complex as it involves an end to the political domination and integration of vast regions. In studying the collapse and regeneration of complex societies, it is important to identify the causes of collapse as well as the relationships between a particular region and the center of political power (Conlee 2006). Resilience theory, developed by ecologists (Holling and Gunderson 2002), is an approach that archaeologists have begun to use to help study the rise, fall, and regeneration of complex societies. This theory, similar in some aspects to previous ideas about cycling, proposes that stability and transformation are both norms and are part of a system’s adaptive cycle (Holling and Gunderson 2002). It was developed to understand the origin and role of change in systems and includes processes on different temporal and geographic scales (Holling et al. 2002a:5). The framework for this theory, the panarchy, is seen as different from traditional hierarchy in that panarchy consists of a set of nested adaptive cycles that have potentially multiple connections (Holling et al. 2002b:74–75). In the adaptive cycle, change is episodic with slow periods that are punctuated by sudden changes and reorganization.
(Holling and Gunderson 2002; Holling et al. 2002a; Redman 2005:72). Translated to human societies, some kinds of changes can be fast, such as political change, and others, such as kinship and belief systems, can be slow (McAnany and Yoffee 2010:10). The goal of resilience theory was to establish a theory that could encompass and be applied to economic, ecological, and institutional systems. As other scholars have noted (e.g. Nelson et al. 2006; Torvinen et al., chapter 11, current volume), there are many challenges in directly testing resilience theory with archaeological data, and a wholesale application of resilience theory to human societies may not be productive. However, certain ideas developed as part of the theory have the potential to aid in developing a deeper understanding of the dynamics of complex societies.

Certain aspects of resilience theory are considered in this analysis of ancient Nasca society. The first concept is that of rigidity. In what Holling and Gunderson (2002:35) describe as the K-phase, prior to collapse, a system can be overconnected and increasingly rigid in its control. This may cause a “rigidity trap” that could lead to severe transformations, especially if triggered by some type of disturbance (Hegmon et al. 2008; Holling and Gunderson 2002; Holling et al. 2002a). A related concept is framed in terms of robustness-vulnerability tradeoffs, which refer to situations when certain things (such as irrigation systems) may create robustness in terms of short-term fluctuations but cause vulnerability in long-term fluctuations (Hegmon et al. 2008; Nelson et al. 2011). Lastly, there is an investigation into what type of resilient institutions, or “building blocks,” may have been used in the reestablishment of society after collapse and abandonment (Schwartz 2006). This chapter considers these various aspects of resilience theory in a heuristic manner to examine whether they are useful in interpreting the data collected from the region and/or in forming new hypothesis about cultural change.

The Nasca drainage sits in a basin between the Andes Mountains and the Cordillera de la Costa, a small coastal range, and includes several river valleys that drain into the Pacific Ocean (Figure 9-1). Nasca is part of the hyperarid northern Atacama Desert with a mean annual precipitation not exceeding 10 mm (Mächtle et al. 2009:39). Because there is negligible annual rainfall, people here were and still are dependent on rainfall in the highlands to bring water into the coastal river valleys. Seasonal changes in the availability of water are in part due to the shifts in the summer monsoon (Eitel and Mächtle 2009:20). These summer rains fall from November through May, when monsoonal thunderstorms in the Amazon region cross the Andes and travel into the upper catchments of the rivers that eventually flow through Nasca. At this time of year, water is in the rivers, but during the rest of the year, the flow is greatly decreased in the northern rivers of the drainage, and in the south, it stops altogether. Besides the seasonal changes in water availability, longer periods of fluctuations also lead to sustained periods of drought and times of increased humidity. Overall, this desert margin area is very sensitive to climatic changes and in particular to shifts in water availability (Eitel
and Mächtle 2009). Despite the challenges of this environment, complex societies developed and were maintained here for many years.

The first large, regionally integrated civilization based in the region, known as the Nasca Culture, arose around A.D. 1. Population was concentrated in the inland river valleys, where arable land and good access to water were located. The heartland was the Nasca drainage and the Ica Valley to the north, although...
the Nasca Culture’s influence (particularly the presence of Nasca fine polychrome pottery) was found farther to the north and south. Debate has continued about the type of sociopolitical organization of the Nasca Culture, particularly if it was a chiefdom or other type of middle-range society (Carmichael 1995; Schreiber and Lancho 2003; Silverman 1993; Vaughn 2009) or whether it was a more centralized state (Bachir 2007; Isla and Reindel 2006; Orefici 2011; Reindel 2009). Regardless of how the society is categorized, the Nasca Culture was a large, complex regional polity that spanned several river valleys. Cahuachi, an important center, has size estimates from 150 ha (Silverman 1993:57) to 24 km² (Bachir 2007:71; Orefici 2011:143) that contained about 40 pyramid mounds and associated plazas in its core area (Silverman 1993:87) (Figure 9-2). There is ample evidence that extensive public and ritual activities took place here, and it has been proposed that it was a pilgrimage center that drew people from all over the south coast of Peru (Silverman 1993). Leaders of the Nasca civilization lived at Cahuachi, and it is thought that much of their power was based on religion.

The soil of the Nasca river valleys is fertile, and the variety of crops included corn (*Zea mays*), potato (*Solanum* sp.), beans (*Phaseolus lunatus, Phaseolus vulgaris*), peppers (*Capsicum annuum*), sweet potatoes (*Ipomoea batatas*), manioc (*Manihot esculenta*), squash (*Cucurbita maxima, Cucurbita moschata*), cotton (*Gossypium barbadense*), and various fruits (e.g., lucuma, *Lucuma bifrea*, and guava, *Psidium guajava*) (Conlee 2000; Silverman 1993; Valdez 1994). Irrigation was essential, particularly in the south, where the rivers are dry half of the year. Fortunately, subterranean water is available year round, but it requires more effort to obtain. In response to this situation, an elaborate system of horizontal aqueducts called *puquios* was constructed that allowed people to efficiently
access the more constant underground water (Schreiber and Lancho 2003). The aqueducts consist of tunnels with open holes (ojos) that feed into pools (kochas) from which water is directed into irrigations canals. Many of these aqueducts are still in use today (Figure 9-3). Puquios construction and maintenance would have required substantial planning, labor, and management, and over time as the irrigation system grew, it is likely that certain groups or individuals were able to control the system. This was probably an important aspect in the growth of centralization and inequality in this period.

In the Andes, land and water rights were traditionally centered on kin-based social groups called ayllus (singular, ayllu). At their core, they have been described as a connection between people and the land that is maintained by collective labor on communal agricultural land and irrigation canals (Allen 1988:33). These groups also shared ceremonial obligations (Urton 1990:175) and were based on a common ancestor. Ayllus are often viewed as the basic political and productive unit in Andean society and are described as “enduring groups” (Spalding 1984:28). However, the concept of ayllu varied in place and time throughout the Andes (Allen 1988:102). Today, they are still important social groups in traditional communities and are well documented in the colonial and Inca period. During Inca times, the concept of ayllu had different usages but at a basic level was an ancestor-focused descent group and present at many different size scales (Rostworowski

Figure 9-3. Ojo of the Orcona puquio and the 2005 field crew near the La Tiza site.
The existence of ayllus in earlier periods is an issue of debate. Some suggest there is a great antiquity in ayllus going back to the Initial Period (1800–800 B.C.) (Moseley 2002); others advocate that ayllus developed along with mortuary monuments containing ancestor mummies in the highlands during the Early Intermediate period (ca. A.D. 1–650) (Isbell 1997). Archaeologists working on the Nasca Culture have proposed that ayllus existed during this time period (Carmichael 1995; Silverman 1993). Many scholars think that although we cannot assume the ayllus of the distant past were the same as those documented historically, they can be used as a model (Urton 1990:175).

The Nasca Culture had highly skilled craftspeople who made fine polychrome ceramics and textiles. The art contained complex imagery of natural and supernatural beings and reflected the religious ideology. An unusually high quantity of fine ceramics was used at all sites, even at small villages on the periphery (Vaughn 2009). Evidence also suggests that the production of the fine polychrome pottery was centered at Cahuachi and under control of the elite (Vaughn et al. 2006). During this period, hundreds of geoglyphs (ground drawings) known as the Nasca Lines were constructed that were also central to religious practices. These geoglyphs were open-air temples that were locations for rituals that likely involved walking, dancing, music, and making offerings to the gods to bring water and fertility to the region (Aveni 1990; Lambers 2006, Reinhard 1988; Silverman 1993; Urton 1990). Another aspect of Nasca religion was trophy-head taking, a practice that involved decapitation and careful preparation of the head. Trophy heads have been found in a variety of contexts and much like the geoglyphs were probably part of rituals involving human sacrifice and making offerings to the gods for agricultural fertility and the continuation of society (e.g., Conlee 2007; Proulx 2001).

The site of La Tiza, located in the Nasca Valley where two river valleys come together, has occupation that dates from the time of the initial growth of Nasca civilization until the Inca conquest in A.D. 1476 and serves as focus of this investigation into the dynamics of society in the region (see Figure 9-1). The Nasca Culture occupation dates between A.D. 80 and A.D. 550 and covered 8 ha including habitation and burial areas. Also here is a ceremonial area where at least one and possibly two decapitated individuals were buried and whose heads were likely taken and made into trophy heads (Conlee 2007). The common burial type of the time consisted of interring people alone in pits with at least one whole ceramic pot, with the body placed in a seated, flexed position (Carmichael 1995). This type of burial was found at La Tiza; elsewhere in the region, elites were buried alone in larger shaft tombs with multiple grave goods (Isla and Reindel 2006).

The Nasca Culture was impacted and transformed around A.D. 650 with the intrusion of the highland Wari state and the onset of more arid conditions. In the Andean region, this period is known as the Middle Horizon, a time of state expansion with both the Wari from the central highlands and the Tiwanaku based farther south near Lake Titicaca spreading out of their heartlands. It has been proposed that this was the end of Nasca cultural identity (Silverman 2008:91). However, a true collapse did not occur at this time because there was not a breakdown in
the political system leading it to become less complex (Tainter 1988; Yoffee 1988). Instead, Nasca was incorporated into a larger state, and new types of alliances, entanglements, and resistances were created with important aspects of local society remaining intact (Conlee and Schrieber 2006; Conlee 2010). I argue that at this time Nasca cultural identity was not lost but instead was integrated with the Wari state and altered in some aspects. A close relationship between the two regions went back to the period before Wari expansion when the prestate Huarpa people adopted much of the Nasca ceramic tradition (Cook 1984–1985; Knobloch 1976; Menzel 1964). The Wari imperial styles also incorporated aspects of the widespread and prestigious Nasca style and suggest the Wari adopted parts of the Nasca religious tradition as well (Conlee 2006; Menzel 1964). Religion is thought to have played an important role in Wari expansion, and there was likely a shared belief system with Nasca.

During the Middle Horizon, there was continuity in certain aspects of life, such as the ceramic art, where expressions of the Nasca Culture religious ideology were still found. In addition, trophy heads were still taken, and this practice was also common in the Wari heartland. Although the large pyramids and plazas of Cahuachi were no longer in use, small ritual areas were located at the site, and there was continued use of the place as a burial ground. There is some debate about the continued use of the geoglyphs during this period with some researchers documenting limited use (Clarkson 1990; Lambers 2006) and others none at all (Reindel 2009). Evidence suggests that agricultural and irrigation practices remained stable with the health and diet of people relatively steady between the Nasca Culture and Middle Horizon, although there is some evidence to suggest that the dietary breadth of the population increased (Buzon et al. 2012; Kellner and Schoeninger 2008). The puquios constructed during the Nasca Culture continued to be in use in the southern drainage.

In Nasca, as in other areas during the Middle Horizon, responses to and interactions with the Wari state were diverse. Notable differences exist between the northern and southern valleys in the number and type of settlements both in terms of local sites and intrusive Wari sites. In the Nasca Valley, in the south, there is evidence of a fairly direct relationship between Wari and local people. In the upper elevations, new Wari sites, such as Pataraya, were established that functioned as important outposts along a major road controlling trade between the highlands and the coast (Edwards 2010; Schreiber 2001). In the lower valley, not far from the Nasca Culture center of Cahuachi, the site of Pacheco was established that was a ritual center but also likely an administrative site (Menzel 1964; Schreiber 2001).

At La Tiza was a small Middle Horizon habitation area of 2.5 ha. New mortuary practices were established here of family mausoleums that were plastered and painted; 70 have been identified in an area of at least 4 ha. In these tombs, multiple individuals were interred with elite grave goods including bronze and copper artifacts, shawl pins, ornaments, and figurines that were found for the first time in the region (Conlee 2010). Tombs with multiple internments, which became a common new burial type, are reported in other areas of Nasca (Carmichael 1995; Isla 2001). Elaborate tombs with multiple burials and evidence of reentry to inter
additional bodies and grave goods were also found in the Wari heartland associated with elites (Isbell 2001, 2004; Isbell and Cook 2002). These new practices are thought to be indicators of ancestor veneration or worship, which was focused on the deceased elites (Isbell and Cook 2002:287–288). An elite identity may have been established who obtained power through their association with the Wari and was shared across a vast area that included Nasca and Wari and was reflected in the new burial practices. Strontium and oxygen isotopic analyses indicate actual foreigners living at La Tiza were buried in the mausoleums (Buzon et al. 2012; Conlee et al. 2009). Two women in their early twenties were identified as nonlocal and of possible highland origin. They may have married into the community as a way of establishing alliances between the highland Wari state and local elites. In addition to these new mortuary practices, there were still burials at La Tiza and elsewhere that were in the previous local style of single individuals buried in pits, usually accompanied by a single whole pot. The two distinct mortuary traditions reflect the segmentation of society during this period with one group associated with elites and the Wari state and the other with nonelites and local tradition.

Other areas of Nasca had dramatically different responses to Wari. In the north, there was a severe decrease in settlements and population with the majority of sites identified as cemeteries with little evidence for habitation (Browne 1992; Reindel 2009; Silverman 2002). Reindel (2009:457) proposes that the general absence of sites was the result of climate change and that the area was too arid after A.D. 600 for agriculture. In this area of the drainage, puquios were never constructed. Despite the low density of Middle Horizon settlements in the north, new mortuary practices similar to those documented at La Tiza consisted of large tombs with multiple burials (Isla 2001, 2009).

In the very far south, new settlements were established, indicating that a faction of the population moved away from Wari sites, perhaps resisted the state, and never came under direct control of the Wari (Conlee and Schreiber 2006; Schreiber 2001). Similar strategies have been documented in other areas in response to intrusive groups. In the contact period in New Mexico, Wilcox (2010:136–137) found that Pueblo people, as well as neighboring groups, often abandoned settlements in order to remove themselves from the coercion of the Spaniards. This is a similar dynamic to what may have been happening in far southern Nasca in response to the Wari incursion. The use of abandonment and resettlement that was employed in this period would also prove to be a strategy that was used to an even-greater degree when the Wari state collapsed.

Economic incentives probably played an important role in Wari’s interest in Nasca, where crops desired by the state, such as cotton, were grown and whose cultivation involved local people. Much of this agriculture is thought to have been locally managed since the highland state would have had little experience with coastal farming practices. Wari invested in some areas, in particular, the Nasca Valley of the southern drainage, and not in others. Here the state ruled through local elites, and it was during this period that new types of intermediate elites were established who obtained power through their association with the Wari state. The people of Nasca became part of a state-level society for the first time and were exposed to power and political organization on a large scale.
Collapse and Abandonment

It was at the time of the disintegration of Wari around A.D. 900 that a true political collapse occurred in Nasca and resulted in the abandonment of the region. The reasons for the breakdown of the Wari state remain unclear although certainly it involved multiple factors since the empire encompassed such a broad area and incorporated various ethnic groups. One possible factor is that Wari invested so heavily in maintaining control over people and land that eventually the economic costs of expansion and rule outweighed the benefits (Tainter 1988:205). There is evidence that climatic change, particularly drought, caused instability (Thompson et al. 1985). The long-term disruption in water availability in the Wari heartland due to drought led to decreasing yields from the large systems of irrigation agriculture, which would have weakened the power of the rulers (McEwan 2006). It has also been proposed that conflict with other groups, such as the Chanka, in the heartland of the Wari was a factor and caused instability (Rostworowski 1999). If Wari was the first true empire in the Andes, as many scholars believe, and encompassed a vast area and incorporated people of different cultural traditions and languages, the challenges of ruling and consolidating may have eventually been too great. When the Wari political system weakened, the state could no longer support administrative centers or economic activities in areas such as Nasca.

Locally, there is evidence for drought conditions in Nasca at the time of the Wari collapse. Geoarchaeological data from desert loess in Nasca indicate the desert margin had shifted east (limiting agricultural land) and that there was increased aridification beginning around A.D. 600 that extended until the fourteenth century in some areas (Eitel et al. 2005). Lake cores from Laguna Pumacocha indicate a period of “marked aridity” from A.D. 900 to 1100 (Bird et al. 2011:8587). This would have impacted the Nasca region since it is dependent on runoff from the central highlands where the lake is located. All over Nasca, sites were abandoned. The last currently known date for the Middle Horizon in the northern drainage is A.D. 820 (Reindel and Wagner 2009:Figure 1.2), and in the southern drainage, it is around A.D. 900 (Conlee 2011; Edwards 2010). It is unknown how long the process of abandonment took place, and it appears to be variable in different areas. At the Wari site of Pataraya, in the upper elevations of the Nasca Valley, the settlement was ceremonially closed in a single event around A.D. 922 in which corridors were sealed, ceramics were placed in caches, fires were lit in the corners, and a fine layer of sand was placed over the surface (Edwards 2010:445–446). This suggests a purposeful but quick abandonment. There is no evidence at local settlements, such as La Tiza, for this type of planned and ritual abandonment. At present, radiocarbon dates and ceramic styles are the best evidence that there was a fairly sudden event in which the majority of people left their settlements and did not return for approximately 200 years. It is unclear where people moved to at this time although it is suspected that many migrated to areas in the higher elevations or farther north up the coast where the rivers are larger and have more regular water.

Abandonment does not always mean a total disappearance of a people or the complete giving up of ownership, and it is often part of ongoing strategies
of shifting residence and migration (Nelson and Schacher 2002:169). Villages and
towns were depopulated at this time in Nasca and no longer used as permanent
settlements; however, there may have been continued short-term or sporadic use
of various places that did not leave behind much of an archaeological signature.
In most cases, there seems to be a combination of both push and pull factors that
led to decisions to leave a region for somewhere else (Hegmon et al. 1998). There
may have been some pull factors, such as attractive environmental conditions,
better defensive locations, less social stress, or religious developments (Nelson
and Schacher 2002:176) that encouraged people in Nasca to move into new areas.
Options for moving and resettling will vary by community, household, and in-
dividual (Nelson 2000:59), and it was not necessarily a homogeneous process.

In exploring possible push factors, drought has often been used as an explana-
tion for change, especially in desert environments. However, Nasca people faced
drought conditions many times throughout the long prehistory of the region, and
it did not lead to the type of abandonment seen at this time. The puquio irrigation
system in southern Nasca was a large investment that helped to stabilize water
supply, and it would have taken more than just increased aridity for people to
completely abandon this system. Examining robustness-vulnerability tradeoffs
helps in understanding possible factors that led to the abandonment of the irriga-
tion system. Large-scale irrigation systems can contribute to resilience to envi-
ronmental variation, but they can also anchor people to locations and generate
vulnerabilities (e.g., Hegmon et al. 2008; Nelson et al. 2010). The use of irrigation
systems to reduce annual variability in water supply can create vulnerabilities to
events and changes that occur over larger temporal and spatial scales (Nelson et
al. 2010:4). The puquios may not have been effective during a drought that lasted
over many years that may have severely limited the subterranean water supply.
There is not yet fine enough environmental data to assess this idea, but it is cer-
tainly something to consider in future research.

In the social domain, irrigation systems can create increased water availability
or stability for one group or individual and create shortages or more variability
for others (Nelson et al. 2010:4). It is possible that Wari fundamentally changed
local communities’ control over irrigation and agricultural systems. It may be that
the Wari-associated local elites had greater control over the puquios and that cre-
ated greater discrepancies in water supply and generated more social inequality.
There is evidence that Wari impacted traditional kinship organization that had
previously been the core of agricultural and water management. This is seen in
the presence of the new mortuary tradition of mausoleums that reflects a change
in elite kin groups with a focus on ancestor worship. In contrast, the continued
practice of single burials in pits with minimal grave goods suggests that com-
moner kin groups stuck to traditional ways. Disparities among these groups may
have led to conflict and vulnerabilities.

The reasons for abandonment in Nasca were undoubtedly complex. The rela-
tively sudden and severe change that occurred as the result of a breakdown in
the Wari political system was likely coupled with more-local issues, including
increased aridity that affected farming and irrigation, disparities in access to
water, a rejection of the religious system that caused social instability, and distrust
of some local leaders (especially those more closely associated with Wari). This could have led to a situation where certain leaders and families lost power and prestige and led to fragmentation of the local political hierarchy, a process that has been noted in other areas after collapse (Faulseit 2012:421).

**Resettlement and Revitalization in Postcollapse Nasca**

After 200 years, the Nasca region was once again inhabited, and despite the severe disruption in occupation, there was a rapid growth of local society. This was the situation in many areas of the central Andes after the collapse of the Middle Horizon states when there was a reemergence of large regional groups in this period called the Late Intermediate period. Settlements were established by a.d. 1155 in northern Nasca (Reindel and Wagner 2009:Figure 1.2) and in the south between a.d. 1200 and 1300. The population was at its highest during this time with large agglutinated villages and towns containing several internal divisions dominating the settlement hierarchy with many of these ranging from 8 to 25 ha (Browne 1992; Conlee 2003; Reindel 2009; Schreiber and Lancho 2003). The site of La Tiza was at its largest in this period and was at least 15 ha. Settlements were more diverse in location and were built on hillsides, hilltops, and valley bottoms. Site type varied from large towns with several internal divisions to smaller, relatively homogenous villages. The town of La Tiza had various sizes and layouts of houses with different masonry styles and many types of architectural features, such as stairways, niches, and exterior and interior storage bins. In contrast, at the valley bottom village (3 ha) of Pajonal Alto, the layout was more uniform and consisted of agglutinated, rectangular compounds of adobe and cobbles. Overall, the size and location of sites, type of architectural layout, structure size, features, construction material, and construction quality varied greatly, more so than in previous times, highlighting the increased segmentation of society.

The increase in population around a.d. 1200 coincides with improved climatic conditions, and it is a period classified as semi-arid with reliable rainfall in the highlands as the summer monsoonal rains increased (Eitel and Mächtle 2009; Eitel et al. 2005:153; Orloff and Kolata 1993). The favorable climatic conditions led to a narrowing of the desert, and this would have played a role in the repopulation of the region as agriculture became more viable. Fields and irrigation systems used previously were revived. There is some evidence that the number of puquios increased and reached their maximum number (Schreiber and Lancho 2003:150). Subsistence practices were similar to those during the Nasca Culture and the Wari period, but there are indications of intensification. An increase in the number, type, and size of storage areas at La Tiza indicates greater surplus was produced. The village of Pajonal Alto saw an increase in the consumption of domesticated camelids (llamas and alpacas) and shellfish (Conlee 2003). This suggests a greater focus on herding and an increase in trade with coastal populations, who by this time had established more-permanent settlements (Carmichael 1991).

The Late Intermediate period throughout the Andes has been described as a period of both intensified warfare and economic interaction and trade. Nielsen
(2005) argues that these are not exclusive and that intense interregional contact often occurs during times of war. During periods of conflict, alliances are important, and exchange and intermarriage often increase. Many sites during this period in Nasca are in defensive locations, and large walls and piles of sling stones (commonly used in warfare in the Andes) are found at many settlements. In the north, some sites were placed in areas away from water but in more-defensible positions (Reindel 2009). In the south, La Tiza has a large wall that sections off the upper area of the western sector (Figure 9-4), architecture spans the highest elevations, and piles of sling stones are associated with architecture of this period. This suggests an increase in conflict or threat of conflict in comparison with earlier periods.

New economic activities and relationships developed during this period. There was a focus on the production of utilitarian goods, such as plainware pottery, cotton yarn, and plain textiles. This contrasts with earlier periods when a focus was on fine pottery and textiles. Evidence shows that many different communities produced goods and exchanged them more frequently than in previous times. Elites appear to have been involved in the production of utilitarian items, including large plainware pots possibly used in feasting (Conlee 2003). There was less self-sufficiency among communities and households and more involvement in trade. Chemical compositional studies (instrumental neutron activation analysis [INAA]) of pottery indicate more clay sources were being used than previously, and more communities were producing pottery (Vaughn et al. 2006). No sherds at La Tiza were identified from the mica-tempered clay group that was used exclusively in the Middle Horizon, signifying a change in production and disuse of
that resource. There was a return to the clay source represented by Group 1 that predominated during the Nasca Culture. In addition to an increase in regional trade, there is also evidence for long-distance exchange in terms of such items as obsidian and *Spondylus* shell. These goods were probably obtained through different means than previously with less-centralized control.

Many of the religious practices associated with the Nasca Culture and the Middle Horizon Wari culture were absent. These include the multiple colors and elaborate iconography (including depiction of supernatural beings) on pottery and textiles. In the Late Intermediate, art is simple, nonrepresentational, and geometric, and a three-color scheme of black, white, and red predominates. There is little evidence that the practice of trophy-head taking continued into this period. In terms of the geoglyphs, there is more Late Intermediate pottery associated with them than during the Middle Horizon (Lambers 2006). However, buildings were constructed on top of geoglyphs in some places, indicating they were no longer important. Many documented long paths are across the plateaus, where large concentrations of geoglyphs are located that are associated with an abundance of Late Intermediate pottery (Lambers 2006:83). In general, the greater populations living and traveling through this area probably contributed to the greater quantities of ceramics from this period. Much of this religious system centered on the geoglyphs was abandoned, or at least the expression of it was changed enough that people no longer participated in rituals in the same manner.

No large ceremonial centers with monumental architecture existed in this period. Instead, small ritual areas were located at many sites. Ritual activities at La Tiza were confined to small ridge and hilltop structures that overlook the valley and the sacred white-sand mountain Cerro Blanco (Figure 9-5). These structures had a variety of features, including fireboxes and large grinding stones. Some open ridgetop areas had an abundance of broken decorated ceramics, especially of bowls and jars, which may suggest that the drinking of *chicha*, maize beer, was central to the ceremonies. At Pajonal Alto are a small mound and plaza where community-based ritual and social activities took place. Rituals were no longer conducted on a regional scale and instead were community or family based. Pan Andean religious ideas were maintained and included mountain and water worship, animal and plant sacrifices or offerings, and the use of *chicha*, *Spondylus* shell, and panpipes in rituals. These are all types of rituals that were practiced in earlier times probably in domestic and community contexts and not necessarily controlled by elites or practiced on a large scale at ceremonial centers. These are also ritual practices that continue into modern times. Burial practices returned to the local style of flexed individuals buried in pits with minimal grave goods that was used by the Nasca Culture and by certain people in the Middle Horizon. The multiple burials and mausoleums associated with Wari were no longer a part of the mortuary tradition.

In this period religious resources were no longer the primary means to build power as they were during the Nasca Culture, possibly because such resources were seen as unstable and too intertwined with the breakdown of the Wari political system. It is likely that the syncretism between Wari and Nasca resulted in a severe disruption to the Nasca ideological system when Wari collapsed. This
situation may have led future populations to restructure the relationship between religious beliefs and the political system (Conlee 2006). Specifically, there may have been a concerted effort to disentangle religious power from political power. The fall of the Wari Empire would have weakened the powerful religious system that had coalesced around the state and the prestigious, older religious tradition of the Nasca Culture. This religion is known to have expanded over much of the central Andes during the Middle Horizon. With the breakdown of the Wari political and economic structures, the influence of the religion would have waned as well.

The political and social hierarchies were also substantially different than in previous periods. The nature of villages changed with less self-sufficiency, and there is evidence for a larger degree of social differentiation within sites than previously (Conlee 2003). On a regional level, there were major centers and secondary centers in both the northern and southern drainage and two levels of hierarchy above the village level (Conlee 2006). Urton (1990:195–196) has documented that people living in the Nasca region at the time of Spanish Contact were grouped into ayllus, parcialidades (subgroups), and moieties. He suggests that in late Prehispanic and early colonial times, there were at least four parcialidades that consisted of many ayllus. The parcialidades were then grouped into two moieties, one in the north and one in the south, each with a cacique principal (hereditary leader). Urton also proposes that two additional moieties existed that divided upriver and

**Figure 9-5.** Small, ridgetop ritual area at La Tiza, with large grinding stone in the center.
downriver ayllus and crosscut the north-south moieties. The implications for Prehispanic sociopolitical organization are that there were at least three levels of integrated organization during the late Prehispanic and early colonial period (Urton 1990:196).

Given the complexity of regional settlement patterns and greater levels of social differentiation at all sites, it appears as if the number and kinds of statuses increase during this period. An expanded and diffused political hierarchy and elites of different types participated in a broad range of activities, such as the production of utilitarian items, exchange, feasting, community or exclusive ritual, and probably warfare and defense (Conlee 2003). During this period, the resources of power were more variable, resulting in a more segmented and heterarchical society with diverse ways of ranking and classifying people (Conlee 2005). In the absence of religion playing such an important centralizing role, expanded economic relationships and regional trade, along with new political structures, worked to integrate the region. Generally, the political structure was fundamentally different than it was during the Nasca Culture and the Middle Horizon.

One of the key questions in the resettlement of Nasca in the Late Intermediate period is, were these people related to the people that lived here before? Recent mitochondrial and Y-chromosomal DNA research from the region suggests that some major changes occurred early in the Late Intermediate period. Genetic distinction between coast and highland populations was very marked during the previous Nasca Culture and Middle Horizon, and there were no significant genetic changes between these two periods as measured by coastal populations in the northern Nasca drainage (Fehren-Schmitz et al. 2010, 2011). Comparisons of Middle Horizon and Late Intermediate period highland populations (in areas adjacent to the northern Nasca drainage) to modern Peruvian populations show low genetic distances, and there is no distinction between modern Peruvian coastal and highland populations, which suggests there was some population process that led to the homogenization of the region starting in the Late Intermediate period (Fehren-Schmitz et al. 2011:279). No coastal populations of the Late Intermediate period have yet been analyzed for comparison, so it is unknown how these populations compare to the adjacent highland areas and what these homogenization processes were. The genetic evidence does suggest change in the Nasca coastal population during this period, and given the overall differences in society documented archaeologically during the Late Intermediate period, it is proposed that the people who resettled may not have been direct descendants of the previous occupants. Or if they were, that society had fundamentally changed in the intervening 200 years and led to new types of sociopolitical organization.

Discussion and Conclusions

Returning to the question of whether aspects of resilience theory can be useful in helping to better understand collapse, abandonment, and the reestablishment of society in Nasca, the answer would be “yes.” In terms of investigating the factors that may have led to destabilization in Nasca when Wari collapsed, the
Reestabilishment of Complex Societies | 229

concepts of overconnectedness and the rigidity trap have some utility. Resilience theory proposes that overconnectedness among different scales of a system can cause increased rigidity and lead to collapse in response to disturbances, such as drought (Holling and Gunderson 2002:35). Connectedness can also be described as integration in which various aspects of society are interdependent (Hegmon et al. 2008:318). In addition to integration, hierarchy (the degree to which some people have more power than others) and conformity (lack of diversity) are also parameters that may contribute to rigidity (Hegmon et al. 2008:319). There is evidence that integration between Nasca and Wari society was high in some aspects and that there was a new and more intensive hierarchy, both of which may have led to rigidity and contributed to collapse and abandonment. Local religion had been co-opted by Wari and incorporated into the state religion; large-scale state politics had changed local Nasca political organization, including kinship relationships; and larger-scale economic structures had impacted smaller-scale local production and trade, as well as possibly the agricultural regime. In this case, in resilience terminology, the smaller and faster adaptive cycles that are associated with quickly evolving political institutions that occurred with the intrusion of the Wari state impacted the larger adaptive cycles associated with slowly evolving social institutions, such as kin groups. These are ideas that can be tested further as more information is gathered on the period of collapse and abandonment.

The concept of robustness-vulnerability tradeoffs is a related factor that can be considered particularly in regards to the irrigation system. The puquios had been established by the Nasca Culture in response to short-term (annual) variations in water availability because they were created to access year-round subterranean water during the dry season when surface water was not available. They were not constructed to deal with long-term fluctuations or drought periods that may have lasted over a century. If the Wari-associated local elites had control over the puquios, at least in the Nasca Valley near La Tiza, this may have created greater disparities in the water supply that increased as conditions became drier and the subterranean water less reliable. This could have led to greater conflict and to vulnerabilities in the agricultural regime. The puquios were also not constructed to deal with broader regional water issues. Puquios were never constructed in northern Nasca because this area did not have the dramatic annual change in surface water that the rivers had in the south. A period of prolonged drought would have affected surface water in the north and created instability in the region as people moved out of this area. Social relationships would have been impacted by these movements with regional trade relationships and alliances disrupted.

In terms of examining how the region was resettled after collapse, ideas generated from resilience theory can also help to better understand the dynamics of the period. Resettlement would have depended on established organizations and institutions of the immigrating population. In the Andes, ayllus were resilient, local, small-scale social institutions that could be used as building blocks in the creation of a new society. Regardless if the people who resettled this region were direct descendants of those who left 200 years previously, family and community organization would have been essential to establishing new settlements and reinvigorating the irrigation and field systems. Ayllu organization is thought to have
been well established by this period and part of both coastal and highland societies. Ayllus were both social and political units, which likely made them more resilient than institutions that were purely political (Faulseit, chapter 1, this volume). This is not to say that ayllus were unchanging institutions. Evidence suggests that at least those associated with elite families may have changed during the Middle Horizon to more of ancestor-focused descent group, such as those documented in later Inca times. Increased distinctions between ayllus were likely in the period of resettlement that led to the greater segmentation of society in this period.

Irrigation and agricultural regimes played an important role in the organization of social and economic relationships and in the creation of hierarchy during the Nasca Culture and Middle Horizon, and this would have been the case during the Late Intermediate period as well. These would have been based on the puquios and on the same crops that had been successful farmed previously. The irrigation system was central in reestablishing successful agricultural yields and in the growth of population. A type of ayllu-based community organization and leadership that built and maintained them previously was likely in place, although the overarching power structure had changed. The irrigation system was at the heart of what made subsistence feasible in this at-times-extreme arid environment and provided a foundation for complex societies to persist in the area. This is similar to patterns seen in other desert-based societies, such as the Hohokam (Redman et al. 2009).

Evidence of pan-Andean domestic- and community-based ritual activity among the people who resettled Nasca shows the resilience of these activities and beliefs. What are no longer in evidence are the practices and beliefs specifically associated with the Nasca and Wari religions. There may be parallels with other areas where transformations in religion have occurred after collapse and abandonment. For example, in early Postclassic Oaxaca when political fragmentation occurred, the temple-palace complexes were abandoned, but one of the social institutions that remained intact was family-based ritual behavior that was resilient and had weak integration (Faulseit 2012). Wilcox (2010) proposes that in the American Southwest, after the breakdown of the Chaco system, there was no longer ritual centralization but instead a switch to secrecy and compartmentalization of ritual knowledge. The people who resettled Nasca at this time, much like the Pueblo people, may have seen a weakness and danger in the centralization of religious ritual and power. And similar to the Oaxaca people, family-based religious practices were resilient and became a focus of ceremonial life in the postcollapse period.

Over the long history in Nasca, people would have used different types of flexible and opportune means in the establishment of the first civilization in the desert (the Nasca Culture) and then through the variable relationships and strategies they employed with the intrusive Wari state. The collapse of Wari and abandonment of the Nasca region were two of the more dramatic periods in Nasca's development. Following 200 years of abandonment, the region was resettled, a new growth phase occurred, and revitalization was possible through resilient institutions and the flexible and opportunistic approaches that were once again used to establish civilization in the desert.
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232 C. A. Conlee


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Reestablishment of Complex Societies

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