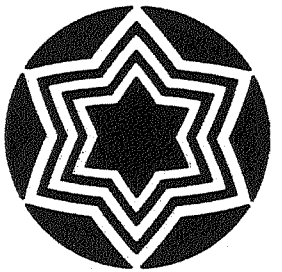
AMERIND STUDIES IN ARCHAEOLOGY

SERIES EDITOR **JOHN WARE**



Volume 1

Trincheras Sites in Time, Space, and Society

Edited by Suzanne K. Fish, Paul R. Fish, and M. Elisa Villalpando

TRINCHERAS SITES IN TIME, SPACE, AND SOCIETY

EDITED BY **SUZANNE K. FISH, PAUL R. FISH, AND M. ELISA VILLALPANDO**

THE UNIVERSITY OF ARIZONA PRESS
TUCSON

The University of Arizona Press

Library of Congress Cataloging-in-Publication Data
Trincheras sites in time, space, and society / edited by
Suzanne K. Fish, Paul R. Fish, and M. Elisa Villalpando.
p. cm. — (Amerind studies in archaeology)
Includes bibliographical references and index.
ISBN 978-0-8165-2540-9 (hardcover : alk. paper)
1. Indians of Mexico—Religion. 2. Indians of North America—Arizona—Religion. 3. Religion, Prehistoric—Mexico. 4. Religion, Prehistoric—Arizona. 5. Indians of Mexico—Rites and ceremonies. 6. Indians of North America—Arizona—Rites and ceremonies. 7. Indians of Mexico—Antiquities. 8. Indians of North America—Arizona—Antiquities. 9. Excavations (Archaeology)—Mexico. 10. Excavations (Archaeology)—Arizona. 11. Mexico—Antiquities. 12. Arizona—Antiquities. I. Fish, Suzanne K. II. Fish, Paul R. III. Villalpando, M. Elisa, 1954–
F1219.3.R38T85 2007
972'.01—dc22 2007009473

Manufactured in the United States of America on acid-free, archival-quality paper containing a minimum of 50% post-consumer waste and processed chlorine free.
12 11 10 09 08 07 6 5 4 3 2 1

CONTENTS

2

Cerros de Trincheras in Northwestern Chihuahua

The Arguments for Defense

Robert J. Hard and John R. Roney

Recently we have been investigating a series of 14 *cerros de trincheras* in northwestern Chihuahua (Hard and Roney 1998, 2004, 2005, 2007; Roney and Hard 2002, 2003, 2004). The sites consist of terraces and other dry-laid stone features on the summits and slopes of isolated hills. In this presentation we emphasize the four sites that we have tested or excavated: Cerro Juanaqueña, Cerro el Canelo, Cerro los Torres, and Cerro Vidal. The largest of these, Cerro Juanaqueña, includes more than 8 km of terrace walls, and its features cover more than 11 ha. AMS radiocarbon dates from the four sites suggest that they were built and occupied during two distinct episodes. The earlier and more substantial lasted some 200 years, about 1300 to 1100 BC. There is evidence of a second occupation at about 300 BC on two sites.

Macrobotanical analyses show that these are among the earliest sites in the Southwest/Northwest with a substantial dependence on maize agriculture. Excluding wood charcoal, maize is the most abundant plant taxon (Adams 1998, 1999a, 1999b, 2000), and we have found possibly domesticated amaranth in some samples (Fritz et al. 1999). All four sites that we have tested include evidence of intensive residential occupation. We suspect that Cerro Juanaqueña was occupied by a group of about 200 people, and that a large part of the population lived there for at least nine months each year. We have documented 13 other cerros de trincheras in northwestern Chihuahua. The others are smaller than Cerro Juanaqueña and were used less intensively, but the three that we tested are all clearly part of the same pattern, dating to the Late Archaic period and yielding a similar range of artifacts, faunal remains, and macrobotanical materials.

The construction of each of these sites represents a substantial invest-

ment of energy. On the basis of a replication experiment, we estimate conservatively that at least 30 person years were required to build the terraces at Cerro Juanaqueña (Hard et al. 1999), and that Cerro el Canelo, Cerro los Torres, and Cerro Vidal each received perhaps one-quarter to one-half of that total. Aside from their initial construction, considerable effort was required to sustain occupation in these inconvenient settings. All fuel, water, food, and construction materials had to be carried, some on a daily basis, as much as 160 vertical m from floodplains at the foot of the hills. Moreover, the hilltop settings are exposed to strong winds in the spring; extreme heat in the early summer; wind, rain, and lightning during the monsoon season; and cold winds and inclement weather in the winter. Despite such costs, people chose to live in these settings, and they must have had strong reasons to do so. We believe that understanding this phenomenon is an important key to understanding the social and material processes surrounding the initial diffusion of agriculture into this region.

Agriculture

Three general explanations have been offered for cerros de trincheras: agriculture, display, and defense. In the case of the Late Archaic cerros de trincheras in northwestern Chihuahua, it is unlikely that the terraces were built for agricultural purposes. Extensive agricultural terrace systems were built in this region about AD 1200, but the late prehistoric features are very different. They were constructed along small drainages and on alluvial slopes where runoff is concentrated and where sediment can be trapped. The terraces that were built on cerros de trincheras, in contrast, show no concern with availability of runoff. They were also built in areas with as little as 230 mm of annual precipitation, which is marginal for direct rainfall farming. Finally, we have computed the total area of potential farmland created by the terraces at Cerro Juanaqueña and have estimated the agricultural production that might be expected, based on yields in the Sierra Tarahumara. This exercise suggests that if planted in corn, Cerro Juanaqueña could have fed four adults for one year (Hard et al. 1999). This is a small payoff for a project that required 30 person years of labor to construct.

Display

It is has also been proposed that cerros de trincheras were constructed as a form of display (Haury 1962). The concept of display includes a wide range of behavior. In this context the specific interpretation is that cerros de trincheras represent a form of monumental architecture, construction which in scale and elaboration exceeds the requirements of any practical function (Trigger 1990). O'Donovan (2002, 2004) proposes, for example, that domestic terraces at Cerros de Trincheras in Sonora were built in monumental proportions to convey messages regarding ethnicity and power, and that the town served as a major social and ritual focal point. The occurrence of monumental construction at 1500 BC in the Southwestern culture area would be quite unexpected. Such behavior is usually associated with higher population densities and with levels of social integration that we do not envision for this period.

Defense

Defense is the third explanation for the construction and residential use of cerros de trincheras. In the remainder of this chapter, we will consider the Late Archaic cerros de trincheras of northwestern Chihuahua from this point of view. We will develop three basic points. First, in a worldwide ethnographic sample, most residential occupation of hilltop settings is associated with raiding and warfare. Second, many of the conditions associated with increased raiding and warfare were present in northwestern Chihuahua 3,000 years ago. Third, many specific characteristics of cerros de trincheras in northwestern Chihuahua conform to criteria for recognition of defensive sites.

Cross-Cultural Study of Hilltop Settlements

Although these three hypotheses have been in the literature for decades, they have been difficult to evaluate, and investigators' biases toward particular hypotheses are sometimes evident. In order to gain further insight into these hypotheses, we conducted an ethnographic cross-cultural study of hilltop settlements. A number of specific questions

motivated this project, including: (1) Why do people live on hills? and (2) Are settlements located on hills for single reasons, multiple reasons, or no particular reason? In our own culture, elevated locations are preferred for reasons of status, view, climate, elite access, recreation, and personal preference. Are these reasonable alternatives to consider for traditional societies without low cost or motorized transport? Are the conditions that motivate the original siting of a settlement the same as causes for continuing to occupy a location? Can the ethnographic literature offer any further insights toward an improved understanding of archaeological hilltop sites?

Methods

Using the microfiche and Web-based Human Relations Area Files (HRAF), we examined the settlement patterns of 186 cultures around the world for cases of residential use of hills and other elevated landforms. This sample represents more than 50 percent of all the cultures in the HRAF files and includes all cultures available on the Web-based eHRAF in 2002 and all microfiche cases at the University of Texas at San Antonio library. The eHRAF sample includes a statistically representative sample of the world's cultures.

This portion of our study focused on ethnographic residential sites, that is, locations where the normal residential unit lives for at least part of the year. Systematically pursuing ethnographic nonresidential uses of hills was beyond the scope of this study, but we did record such use by the same groups that residentially use hills. We also focused on only the residential hilltop aspect of each ethnographic group's settlement pattern, as opposed to sites in all settings.

The initial step in the study was to identify cultures that used elevated landforms for residential settlements. Using the HRAF system of cultural materials codes (Outline of Cultural Materials), we searched under codes related to settlement patterns. For the microfiche files this required reading all sections related to settlement patterns for all groups. For the Web-based eHRAF, we used the full-text search engine to locate synonyms and their variants (e.g., hill, bluff, mountain, ridge, terrace, escarpment, mesa) that co-occur with settlement pattern information.

Selecting cases for inclusion in the study required a number of definitional decisions. A case was identified if its normal settlements included residential use of the top or sides of any pronounced elevated landform, high or low. However, cases where settlements simply went up the lower slopes of a valley were not considered. Similarly, small knolls, slight slopes, low rises or other situations where it appears that slopes were gentle and/or elevations slight were not considered to be "pronounced elevated landforms." We accepted cases with settlements on hillocks, for example, while rejecting those on gentle rises. We also required that settlements be on particular elevated landforms, not simply "in the mountains." A number of pastoralist groups were excluded on this basis. Cases also had to belong to an identifiable ethnic group for a known time and place. Hill uses that appeared to be atypical for a group or were nonresidential were also excluded, as were rockshelters. Field houses and herding camps were considered to be special use sites rather than residential sites, as they were typically utilized by a subset of the usual domestic unit. Note that for ease of discussion we use the term *hill* generically to mean the top or slopes of any of these pronounced elevated landforms. Applying the procedures discussed above to 186 cases, we identified 42 ethnographic groups that use elevated landforms for residential sites.

Once cases were selected, we returned to the HRAF files for more detailed examination of each case in order to identify explanations of the hill use. As we reviewed each case, we read or electronically searched all sections identified by cultural material codes on settlement pattern, land use, architecture, public structures, political organization, religious practices, sacred objects, warfare, agriculture, and monuments, searching for references to use of hills using the hill synonyms.

A typical cross-cultural approach searches for correlations between variables such as presence of warfare and the presence of hill residential locations. For the purposes of this study, such correlations would have been seriously misleading, because even when warfare does occur, hill use may be unrelated to that circumstance. In order to understand the reasons for hill use, we had little choice but to rely on the observers' explanations. After eliminating two cases with insufficient information, we were left with 40 ethnographic groups. These 40 cases are listed in appendix 2.1, which also tabulates the ethnographic explanations given for residential use of elevated landforms.

Limited Options. We used the term *limited options* to signify cases in which there appear to be few alternatives to living on hills. In most cases the ethnographers drew this inference, but in a few cases, such as the Inca, we made the inference ourselves, based on descriptions of topography, as well as the location and context of other settlements. In extremely steep, mountainous terrain where most settlements are on steep slopes and little bottomland is available, such an inference is justified. "Limited options" was also identified under conditions of population pressure where authors clearly indicate that all potential settlement locations are occupied, as is the case with the Thai Miao. There were also cases in which hills are occupied because low-lying ground floods or remains damp, such as among the Ganda of Uganda.

Defense. Ethnographic explanations for all categories were critically evaluated, corroborated with additional sources as needed, and in most cases accepted. However, we were careful not to accept unsubstantiated statements about defense or warfare. We required specific discussions of fortifications, raiding, or other direct evidence of the defensive nature of a location before an inference of defense was accepted. There were a few instances in which an elevated settlement location was attributed to warfare without any corroborating evidence, and those explanations were not accepted. However, we did accept physical evidence of defense at a hilltop location, such as fortifications and city walls, as prima facie evidence that defense was at least one of the reasons for using a hilltop location.

Agriculture. Agriculture was accepted as an explanation if hill residences provided access to terraced or unterraced hill slope fields and there were statements to that effect. Sometimes both limited options and agriculture were accepted as explanations if there was little bottomland and hill slopes were both farmed and lived on. However, agriculture, rather than limited options was accepted as an explanation in cases where people could have lived on lowlands but instead elected to live near their hillslope fields, as among the Ifugao of the Philippines.

Environment. Environmental explanations were accepted whenever hill residences provided access to particular resources other than fields, such as food resources, protection from wind, access to springs for domestic water, a location to watch for game, avoidance of insects, etc. Examples include the Mbuti, Copper Inuit, Pawnee, and the Khasi of India.

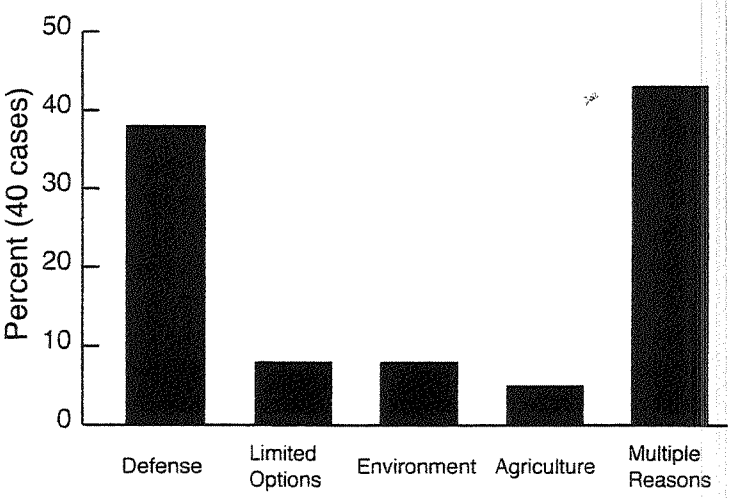
Symbolism. We added this explanatory category after reading about spiritual linkages and ethnic identification strongly associated with particular landforms. Examples occur among the Hopi and the Dogon of Mali.

In a number of cases, explanations for hill uses varied by time or place within a given culture group. The analysis does not treat every context within a culture as a separate case with a separate explanation, but rather lists the one case as having multiple explanations. While this procedure sacrificed precision, we felt it was a more conservative approach that minimized assumptions. However, notations in appendix 2.1 distinguish among the various uses and their explanations. We accepted cases that were tied to ruins and other abandoned locations if they appeared to be well understood and it was clear that the ruins belonged to the same culture as the case being examined. For example, the pre-Columbian hilltop ruins in the Aymara region of Bolivia were not considered, as they probably do not belong to the ancestors of the Aymara and there was little information about the ruins in the HRAF documentation. On the other hand, ruins of thirteenth- to sixteenth-century hilltop castles in Okinawa were included as an element of that case, because their Okinawan use was documented. Certainly not all cases had similar levels of information, but cases were accepted when there was sufficient oral history, historical, ethnographic, and/or archaeological information in the HRAF files to achieve a basic understanding. Only in the cases of the Maori, Akan/Ashanti, and the Okinawans did we pursue literature outside the HRAF records. We expect that further research on other cases will corroborate our findings, while at the same time contributing additional explanations that we did not discover. For example, we considered fifteenth-century Slovenian hilltop castles as placed on hills for defensive reasons, but more detailed historical or archaeological research may reveal additional explanations related to agriculture, environmental resources, etc. However, it is unlikely that the defensive component of the explanation will be rejected based on further research. Appendix 2.2 presents bibliographic citations for the appendix 2.1 entries.

Appendix 2.1 also indicates whether or not monumental construction occurs on the elevated landforms. Such concerns were outside the repertoire of nineteenth- and twentieth-century observers, and the criteria for identifying monumentality are not always clear. We identify monumental architecture as large public buildings (including palaces) that required major labor investments and involved centralized control or planning (McGuire 1998; Nelson, this vol.; O'Donovan 1997). Following O'Donovan (1997), we considered the visual impact of monumental construction. However, visual impact was difficult to evaluate, as in no case was the visual impact on members of an ethnographic group recorded, only the visual impact on the investigator. Because they are not public structures, neither the massive domestic structures among the Garo of India nor Iroquois longhouses were considered monumental, nor were the enormous terraced fields of the Ifugao, despite their scale and visual impact. In keeping with the emphasis of this study, we focus on constructions that were elements of towns or other residential centers, and exclude monuments that were isolated from towns. Therefore, huge mountaintop shrines to Buddha and isolated temples are not considered. Notations in appendix 2.1 also identify the nature of these monumental works as political, religious, or ritual. Large temples, churches, and mosques are considered religious monuments. Palaces, castles, elaborate city gates, massive encircling screens or fences, and administrative centers are considered political monuments. Maori large, carved posts are monumental ritual objects.

Results

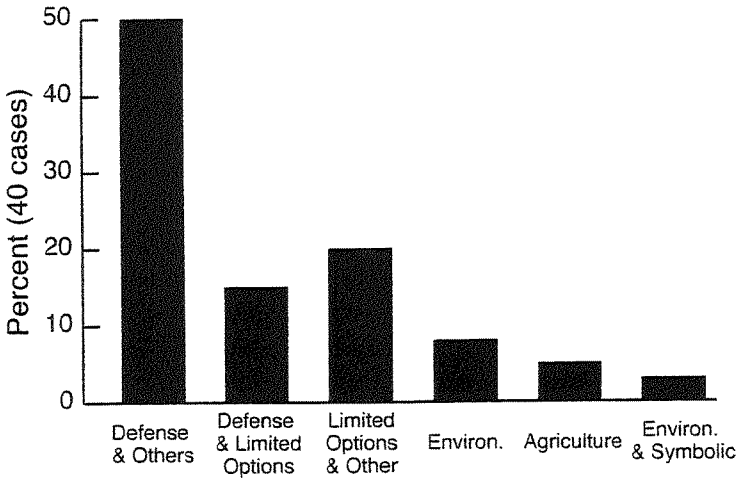
Figure 2.1 is a graph showing the various ethnographic explanations given for residential use of hills and other elevated landforms. In 38 percent (15) of the cases, defense was the only reason for selecting upland residential locations. These cases include, for example, the Shluh/Berbers of Morocco, who fortified settlements on hilltops; the Maori, who constructed elaborate hilltop fortified villages; and the Hadramaut of South Yemen, who constructed walled sultans' palaces on clifftops. Three cases (8 percent) are attributed solely to limited options. These include the Amhara, who live on the deeply incised Shoan plateau of Ethiopia; the Pomo, who live on sides and tops of ridges due to the deep, narrow canyons of the Sierra Nevada in California; and the Ganda



2.1 Single and multiple explanations for hill residential use.

of Uganda, who must select low, flat-topped hills because the lowlands in the vicinity of Lake Victoria are all swampland. Another three cases (8 percent) can be attributed solely to environmental conditions or access to resources excluding agriculture. These include the Mbuti, who seasonally establish camps to obtain honey on hills; the Kuna of Panama, who locate some villages on 30-foot-high bluffs to avoid river floods; and the Tzeltal of Chiapas, Mexico, who live on small hills to take advantage of improved drainage. In only two cases (5 percent) do people choose to live on hill locations only in order to gain access to elevated agricultural fields. These examples include the Ifugao of the Philippines, who live close to their elaborate, irrigated rice terraces; and Serbs, who live on high alluvial terraces near their fields. The remaining 17 cases, or 43 percent, are associated with multiple explanations.

Considering only the 17 cases with multiple explanations, the number of explanations for a single case ranges from two to five. The number of explanations for a given case is related to the complexity in the circumstances of hill living, to the changing history of hill occupation, and to the amount of information for each case. Among these 17 cases, limited options, defense, and access to agricultural land were each represented 11 times, or 65 percent of 17 cases. Environmental reasons



2.2 Multiple explanation cases are distributed among the major categories of explanations.

were given in 10 (59 percent) cases, and 3 of 17 (18 percent) ethnographic groups chose to live on hills or other elevated landforms in part for symbolic reasons.

Sixteen of these 17 multiple-explanation cases include defense and/or limited options as explanations. The most common co-occurrence among the 17 is agriculture and limited options, with 10 examples. Defense and limited options co-occur in six instances. Figure 2.2 includes all cases and distributes the multiple-explanation cases among the single-explanation defense and limited options as appropriate. Fifty percent involve defense, including 5 cases that are defense associated with a variety of other reasons plus the 15 defense-only cases. In addition, 6 more cases (15 percent) are associated with defense and limited options. An additional 20 percent include limited options without defense. Therefore, 65 percent of all cases (26) of hilltop living can be explained by defense, and another 20 percent can be accounted for due to limited options, although many of these are associated with additional explanations as well.

The role of warfare in siting villages and towns on elevated landforms is further emphasized as specific shifts in land use patterns are documented following cessation of warfare. In 13 of the 26 defense-related cases, residents wholly or partly relocated to lower elevations following the end of hostile threats. These cases include the Dogon (in part), Alor, Maori, Tanala, Siwans, Eastern Toraja, Garo, Khasi (relocated to slopes), Copper Inuit, Hopi (in part), Iroquois, Lau Fijans, and Maya of Icaiche. We had information on the circumstances that prevailed when hilltop locations were settled in only two cases, those of the Hopi and the Icaiche Maya, and both were defensive reactions to conflict. It is notable that substantial segments of the Dogon and Hopi populations continue to occupy elevated locations due to other resources accessible from their elevated locations, limited options for moving elsewhere (Dogon), and the symbolic value that their traditional homes offer. Unfortunately, information is lacking on shifts or persistence in settlement pattern for many of the remaining cases.

Eleven (28 percent) of the 40 ethnographic cases included monumental architecture at the hill residential locations. Nine cases include political monuments, including castles, palaces, and city gates. These cases included the two African kingdoms of the Ashanti and Ganda, which build enormous palaces surrounded by screens several kilometers in length but not fortified. Only two cases have only religious or ritual monuments, the Siwan mosques and the Maori huge carved posts.

Do hilltop settlements with monumental architecture have explanations that suggest their circumstances are significantly different from nonmonumental sites? In seven of the 11 monumental cases, defense is considered the only explanation, and defense is among the explanations in two additional cases. Therefore, in nine (82 percent) of these cases, defense is one of the reasons for use of hills. Three (27 percent) ethnographic cases with monumental architecture are related to limited options, two (18 percent) are related to agriculture, one (9 percent) is related to environmental reasons, and one (9 percent) includes symbolism as a reason for locating on hills (the Ashanti). Defense is strongly related to hilltop settlements whether or not monumental architecture is present. In fact, nine of the 11 monumental cases contain massive defensive structures such as castles or city walls. There appears to be little difference in the explanations for cases that have monuments versus those without monuments.

We found no cases suggesting that people take advantage of elevated

landforms principally as a form of display or to enhance the effects of monumental constructions. However, the Ashanti case is particularly relevant to issues of monumentality and symbolism, as chiefly centers are sometimes established on hills where enormous enclosed palaces are built for the king, retainers, and wives (including the Ashanti capital of Kumasi). While it appears that in this case low hills are sometimes preferred in order to avoid constantly damp valleys, some hills are also imbued with symbolic significance related to ancestors and royal descent. In one case following British destruction of symbolic fetishes and elimination of the office of priest-king, the inhabitants abandoned the hill and settled at its foot, suggesting that the elevated location was preferred due to its symbolic ties to kingship. However, in all but this and the Ganda case, examples of monumental constructions are strongly linked to defensive functions, and it is difficult to argue a dominant role for the symbolic impact of monuments on hills.

We noted the nonresidential use of elevated landforms, and they are listed in appendix 2.1. Twenty-four (60 percent) of the 40 cases included the practice of some type of hillside agriculture, and in eight of these 24 cases agricultural terraces are constructed. It is also clear that elevated locations are favored for an array of religious activities, including: shrines (28 percent of 40 cases), funerary locations (25 percent), temples and other communal religious structures (23 percent), ritual locations without construction (10 percent), homes of spirits (10 percent), and sacred natural objects such as trees (10 percent). Secular activities were not as common as religious ones and included: herding or field stations (10 percent), communal secular buildings such as schools (13 percent), fortifications (15 percent), and lookouts (10 percent). Note that some of these special locations are occupied, but not by a typical residential social unit (for example, Buddhist temples in Korea).

Discussion

These results are highly patterned. Eight-five percent of cases can be accounted for by the presence of one or two conditions, defense and/or limited options. There is clear evidence that defense was the principal factor motivating hilltop living once the threat of warfare passed. In half of the 26 defensive cases the settlements shifted to lower elevations once hostilities ended.

How do these findings apply to residential occupation on cerros de trincheras? Of our 40 ethnographic cases in which people choose to live on hills or other elevated landforms, 14 examples are groups whose territory is located in rugged settings where there are no alternative residential locations (our limited options explanation). Clearly this circumstance is not present in the basin and range topography where the cerros de trincheras are located. Defense is a factor in 20 (77 percent) of the 26 remaining cases, and is the sole explanation for this behavior in 15 (58 percent) cases. Environmental reasons are the second most common ethnographic explanation for residential occupation of hills, being cited in nine (35 percent) examples, five of which include defense and are also included in the above count (77 percent). The four remaining environmental cases include Mbuti honey camps plus three other cases that use low, elevated landforms to avoid flooding or for improved drainage (Ashanti, Kuna, and Tzeltal). Proximity to agricultural fields is cited in only three (12 percent) of the 26 cases; they include the Serbs, the Ifugao, and the Hopi, and the latter included defense as an explanation. Finally, in two of the 26 ethnographic cases people chose to live on hills for symbolic reasons, and in each of these cases other factors were also involved.

Returning again to the entire set of 40 ethnographic groups, in no case are hills residentially occupied for solely symbolic reasons. No case was found in which occupied hills appeared to have been elaborated as monuments. Agriculture is a common factor in hill living only when associated with conditions of limited options or under unique circumstances. However, we did find that many special use functions of hilltops were related to ritual activities. These findings strongly suggest that in the absence of any other information, raiding and warfare are the most likely explanation for residential use of the cerros de trincheras, although independent archaeological data and methods for evaluating these sites must continue to be pursued.

From our work some characteristics of defensive sites emerge. The high frequency of abandonment of hilltop locations following the end of warfare is consistent with LeBlanc's (1999) suggestion that defensive locations may be characterized by short use lives and rapid abandonment. We also noted information concerning the vertical height of elevated residential locations. Table 2.1 lists both nominal and quantita-

Table 2.1 Height of Hills.

Nondefensive Explanations		Defensive Explanations	
Group	Elevation	Group	Elevation
Tzeltal	10 m	Dogon	300 m
Ashanti	low	Alor	100–150 m
Ganda	low	Hadramaut	60–100 m
Garo	low	Hopi	120 m
		Lau Fijan	250 m
		Maya	120 m
		Inca	high
		Iban	high
		Korea	high
		Pawnee	high
		Luo	high
		Garo	high

tive information on hill height, dividing the cases into nondefensive vs. defensive explanations. The hill height of defensive cases is from 60 to 305 m and is generally described as high. Three nondefensive cases are described as low, and a fourth is listed as 9 m high. All four of these cases were related to living on elevated locations to avoid wet conditions and flooding. (Note that for this comparison, the high Garo defensive sites and the low-hill Garo nondefensive settlements are separated.) Higher hills are preferred for defense, and lower hills may satisfy nondefensive concerns. In addition, the elevated settings of defensive locations have particular characteristics and include isolated hills, isolated ridges, small mountain spurs, locations next to narrow gorges, slopes with difficult approaches, platforms cut into the side of mountains, hilltops hidden by thick brush, and locations next to precipitous cliffs. All are clearly characteristics that enhance defensibility and limit access.

Settlement locations generally represent spatial compromises to facilitate access to environmental and social resources within particular

ecological and cultural settings. In most cases, living in elevated locations serves to reduce access to many resources and external social interactions. During war this is advantageous; during peace it frequently is not. People apparently do not elect to live in elevated locations unless compelled to do so by circumstances that warrant the high transport costs of hill living. In contrast, it appears that many ritually related special use sites may involve a preference for hilltop locations. The patterns in our own society of some preference for elevated locations by the wealthy appears to be an artifact of modern conditions (including mechanized transportation) and cannot be expected to be analogous to traditional situations.

The analysis presented above points strongly to raiding and warfare as an explanation for residential use of isolated, elevated landforms. Are there other reasons to apply this explanation to Late Archaic cerros de trincheras in northwestern Chihuahua? The following sections of this chapter address this question.

Conditions Associated with Raiding and Warfare

There is growing recognition that raiding and warfare are not limited to societies with obvious social hierarchies. Several recent publications argue persuasively that anthropologists have long underestimated both the occurrence and importance of conflict in small-scale societies (Keeley 1996; Otterbein 2000), and in the past few years a number of books and articles have begun to reconsider the role of warfare in the prehistoric Southwest (Haas 1990; Haas and Creamer 1996; LeBlanc 1999; Lekson 2002; Rice and LeBlanc 2001; Schaafsma 2000; Wilcox and Haas 1994). Anthropologists have considered raiding and warfare from a wide range of perspectives, but for the purposes of this discussion our immediate concern is with the contexts that lead to these kinds of behavior. That is, what general social, economic, and technological conditions are commonly associated with raiding and warfare? Keeley (1996:117) summarizes empirical studies that have addressed the question. Surprisingly, he found that raiding and warfare are not strongly correlated with either high population densities or social hierarchies, as we might expect.

Keeley does specify four conditions associated with increased bellicosity: (1) rapid population growth, which increases economic demands

and also stresses the capacity of social institutions; (2) development or introduction of new technologies of food production, transportation, and war; (3) the existence of frontier zones, such as zones of contact between complex and egalitarian societies, between pastoral nomads and village farmers, and between farmers and foragers; and (4) expectable but unpredictable disasters such as droughts, floods, and insect infestations.

Thirty-five hundred years ago agriculture was making its appearance in northwestern Chihuahua. This new technology opened a whole range of subsistence possibilities and at the same time imposed new constraints. People in different settings responded to agriculture in different ways. In northwestern Chihuahua we see a dramatic population increase, a strong emphasis on settlements in floodplain settings, increased sedentism, and population aggregation. These conditions must have required major changes in social institutions and, in our view, would have led to the kind of instability that Keeley describes. Instability would have been accentuated by fluctuations in agricultural production, which can result from a variety of causes. This is just the type of expectable but unpredictable disaster that Keeley found to be associated with increased raiding and warfare. Proximity to foraging people who continued a very different lifestyle in the Basin and Range province to the east implies that the early agricultural sites in northwestern Chihuahua were also a frontier zone, and this may also have been a factor that increased the intensity of conflict in the region.

In short, all of the conditions that Keeley identifies were present in northwestern Chihuahua 3,000 years ago, leading to a strong theoretical expectation of violent conflict during this period. Can we accept the residential occupation of cerros de trincheras as an empirical confirmation of this expectation? The next two sections of this chapter address this issue.

Settlement Pattern Criteria

Another approach to this issue is to consider the specific characteristics of the cerros de trincheras in northwestern Chihuahua. LeBlanc (1999) has developed a series of settlement pattern criteria that he uses to assess the prevalence of raiding and warfare in the prehistoric Southwest, and

in this section we will evaluate the Late Archaic cerros de trincheras in northwestern Chihuahua against his criteria. The strength of this approach is that LeBlanc's criteria are not post hoc arguments developed to explain selected aspects of the cerros de trincheras. Instead they are general observations derived from a broad consideration of raiding and warfare, which appear particularly applicable to this situation.

One of LeBlanc's criteria, the location of sites on defensible landforms, is also a hallmark of the cerros de trincheras. Our own ethnographic review of hilltop occupations confirms an association with raiding and warfare and suggests that defensible postures are characterized by high (ca. 60–300 m), isolated locations with difficult access. Table 2.2 summarizes the four cerros de trincheras that we have tested or excavated. The lowest is Cerro los Torres, an 80-m-high hill, and the other three are on hills that rise between 120 and 160 m above the surrounding terrain. All of these hills have steep sides, and most of the constructed features can be reached only after climbing a steep slope. These sites all offer excellent views in 360 degrees. Detailed artifact distribution data from Cerro Juanaqueña indicate that residential occupation occurred on all sides of the hill, and it is likely that this is true of the other sites as well. The combination of excellent visibility and steep slopes ensures that the inhabitants of these hills could not be taken unaware. Any potential attacker could be seen from some distance, and attackers could not rush the settlement or even approach it rapidly.

Another of LeBlanc's criteria is evidence that sites were planned and laid out for defense. In the case of these four cerros de trincheras, perimeter berms are the most obvious evidence for planning and defensive layout. Although individual terraces are the basic features on these sites, the terraces are often contiguous, forming linear groups that we have termed macrofeatures. On the four cerros de trincheras discussed here, the macrofeatures defining the exterior boundaries of the sites are very large. At Cerro Juanaqueña the macrofeature that defines the northern, eastern, and southern perimeter of the site consists of 22 adjoined terraces forming a 400-m-long alignment. Where this macrofeature extends perpendicular to the slope, it resembles other macrofeatures composed of individual terraces, but on the northern and southern sides of the site, it follows the slope and takes the form of a large cobble berm rather than a terrace. This feature is also different from most other macrofeatures

Table 2.2 Four Cerros de Trincheras in Northwestern Chihuahua.

Site	Dist. to Floodplain (km)	Ht. of Hill (m)	Area (ha)	Total Terrace Length (m)	No. of Rock Rings	Period
Juanaqueña	.4	120	11.2	8,350	114	Late Archaic
Upper Complex			*6.0*	*4,980*	*100*	*Late Archaic*
Lower Complex			*5.2*	*3,370*	*14*	*Late Archaic*
Canelo*	1.9	160	5.8	3,900	50	Late Archaic
Torres	.9	80	5.2	2,300	8	Late Archaic
Vidal	.2	120	4.0	2,190	25	Late Archaic

Note: Lines in *italics* are subtotals.
* indicates some outlying features are excluded.

in that the cobble berm extends well above terrace surfaces in many places. A similar feature defines much of the exterior boundary of Cerro el Canelo, and Cerro los Torres is surrounded by a striking perimeter berm. Similarly, Cerro Vidal is enclosed by a perimeter berm on three sides, while the fourth side consists of a near vertical slope. These berms did not consist of freestanding masonry walls, which characterize later periods of Southwestern prehistory. However, they would have offered protection to defenders standing behind them, and because of their height and the insecure footing, they would have impeded attackers. Within the sites a maze of macrofeatures composed of adjacent terraces would have provided successive lines of defense.

LeBlanc argues that increasing site size is another line of evidence suggesting warfare, based on the simple principle that larger communities have a significant military advantage over smaller neighbors. We do not have good information about settlement sizes in the times preceding

1250 BC, but few prehistorians would expect any settlements approaching the scale of Cerro Juanaqueña. We have argued elsewhere that this one site may have included 200 to 300 inhabitants through much of the year (Roney and Hard 2002). The other three cerros de trincheras may have housed as few as 50 or as many as 150 inhabitants. This situation contrasts sharply with models of preagricultural times, when small populations of foragers are thought to have spent much of the year dispersed into individual nuclear family units. Response to raiding and warfare is one of several processes that can lead to population aggregation, but at least these observations are consistent with assumptions of prehistoric warfare.

LeBlanc points out that rapid construction is another characteristic of many defensive sites. He argues that when small, dispersed communities are abandoned due to the threat of attack, large defensive sites are often built immediately thereafter, using techniques particularly suited to rapid construction. One line of evidence suggests that the cerros de trincheras in northwestern Chihuahua were built rapidly, rather than growing slowly through accretion. The perimeter berms at the four sites described here suggest that large portions of these sites did not grow slowly through uncoordinated construction. Instead, the features appear to have been planned to accommodate specific needs and constructed in coordinated efforts.

Several of LeBlanc's expectations are either not met or cannot be addressed using data from northwestern Chihuahua. For example, none of the sites have protected domestic water supplies, a characteristic that is largely precluded by their hilltop location. However, all are adjacent to the floodplain of the Rio Casas Grandes, with relatively easy access to water.

LeBlanc also suggests that smaller sites needed more defensive capabilities than larger sites, hypothesizing that smaller sites are more likely to be located in highly defensible settings. We have found no evidence of this. Indeed, Cerro Juanaqueña is almost certainly the largest Late Archaic site in the region, and it is among the most defensible. LeBlanc does state that during intervals of extreme warfare, small sites may cease to exist. Instead, everyone resides in some form of larger, fortified community. Given the brief span of occupation at Cerro Juanaqueña,

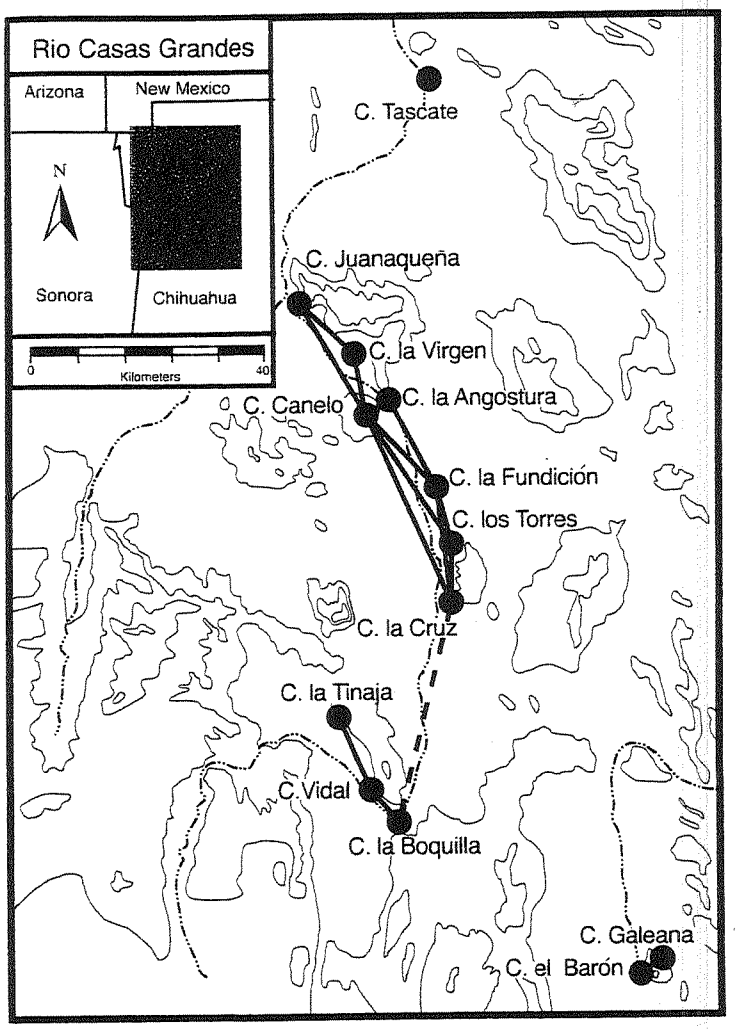
and the apparently synchronous use of cerros de trincheras in this region, this may well be the case during two distinct episodes in the Late Archaic period.

Other criteria that cannot be satisfactorily addressed on the basis of current information pertain to site distributions. During many periods of warfare in the Southwest, settlements tend to occur in distinct clusters separated by no-man's-land. Sites are clustered to provide mutual aid, and the empty zones between clusters are not exploited intensively, because they are not secure. The cerros de trincheras in northwestern Chihuahua form a distinct cluster as LeBlanc predicts, but settlement pattern data from the Late Archaic period are so incomplete that we are reluctant to stress this argument. Similarly, arguments related to the sequence of site abandonment within clusters and the sequence of cluster abandonment within a region simply cannot be evaluated at this time.

We do know that line-of-sight communication is possible between many of the cerros de trincheras in northwestern Chihuahua. Figure 2.3 shows all of the cerros de trincheras that we have documented, as well as the visual linkages among them. The 14 sites form three, or perhaps four, separate groups. Cerro Tascate in the north appears to be isolated, and three sites in the Rio Santa Maria drainage form a separate group. Seven sites in the Rio Casas Grandes drainage are definitely intervisible: Cerro Juanaqueña, Cerro la Virgen, Cerro el Canelo, Cerro la Angostura, Cerro la Fundición, Cerro los Torres, and Cerro la Cruz. Further south, Cerro la Boquilla de San Diego, Cerro Vidal, and Cerro Tinaja also form a definite group of visually interconnected sites. These two groups are connected by a line of sight between Cerro la Cruz and Cerro la Boquilla de San Diego.

Other Evidence

Several other observations have a bearing on the likelihood that the Late Archaic cerros de trincheras in northwestern Chihuahua reflect intensive episodes of raiding and warfare. First, LeBlanc and other authors often consider poorly treated human remains as evidence of warfare. These are human remains that did not receive the formal, highly standardized treatment typical in many prehistoric Southwestern societies. At Cerro Juanaqueña we excavated only 0.1 percent of the cultural deposits (37.8



2.3 Line-of-sight relationships between Chihuahua cerros de trincheras locations.

m^3 excavated; 31,000 m^3 total), and we did not encounter any formal burials. However, three different proveniences on the site did yield 10 small fragments of human bone, and two of the human bone fragments from two different proveniences were burned (Schmidt and Nisengard 2000). It is possible that these bone fragments are derived from disturbed burials that we simply did not encounter in our test excavation units. Also, Late Archaic cremations are known from the Southwest Basin and Range province, and this behavior, or even accident, could account for the burned fragments of human bone. However, it is also possible that these observations reflect poorly treated human remains, another indicator of violence and warfare.

Second, a phenomenal number of projectile points have been recovered from Cerro Juanaqueña. This site has yielded more than 300 projectile points, and another 220 bifaces or biface fragments, most of which are also almost certainly from projectile points or preforms. This contrasts dramatically with artifact assemblages from many other Late Archaic sites in the Southwest. Based on size, most of these projectile points are dart points. They accompany a faunal assemblage that is strongly dominated by rabbits, a prey species most often taken by clubs, throwing sticks, and nets rather than by projectiles. These considerations raise the possibility that the artifact assemblage at Cerro Juanaqueña, and perhaps at some of the other cerros de trincheras as well, reflects raiding and defense.

Third, radiocarbon dates from four cerros de trincheras in northwestern Chihuahua suggest that use of these sites was brief and synchronous throughout the region. The 23 AMS radiocarbon dates from Cerro Juanaqueña indicate that its principal period of use was a brief interval around 1250 BC, with a second, more limited occupation around 300 BC. Four AMS radiocarbon dates from Cerro los Torres and Cerro el Canelo indicate that those sites were occupied at the same time as the principal occupation at Cerro Juanaqueña, about 1250 BC. Two AMS radiocarbon dates from Cerro Vidal show that it was occupied at the same time as the second occupation at Cerro Juanaqueña, around 300 BC. These data suggest that regional occupation of cerros de trincheras was synchronous during two episodes. These observations are difficult to reconcile with the "agriculture" and "display" models for cerros de trincheras.

Summary and Conclusion

Why did people live on hilltops in the Rio Casas Grandes valley 3,000 years ago? Three lines of argument, each substantiated with independent data, point to warfare. First, based on a global cross-cultural sample, people expend the additional energy to live on elevated landforms when defense is a key concern and when there is an absence of other places to live. The latter is certainly not a concern in the Rio Casas Grandes valley. The few other conditions of hilltop living include avoidance of flooding, access to agricultural fields, access to a wild resource (in one case), and symbolic reasons. In no case are hills residentially occupied for solely symbolic reasons. Agriculture is a common factor in hill living only when associated with conditions of limited options or unique circumstances. Low elevations suffice to avoid flooding. In contrast, special uses of hilltops are common and frequently relate to ritual activities. These findings strongly suggest, when linked with the other arguments, that raiding and warfare are the most likely explanation for residential use of the cerros de trincheras.

Second, Keeley's conditions that stimulate warfare were likely to have been present, including: rapid population growth that may have stressed resources, introduction of food production, a zone of contact between farmers and foragers, and unpredictable droughts and floods.

Third, the cerros de trincheras sites meet LeBlanc's predicted defensive characteristics, including: defensible land forms, defensive site layouts, rapid construction, large populations, and site intervisibility. Other data suggestive of warfare include two distinct but synchronous occupations among the four sites, and large numbers of projectile points at Cerro Juanaqueña. In summary, these sites are best understood as residential defensive settlements rather than any of the alternative models.

Acknowledgments

Our research in northwestern Chihuahua has been supported by the Instituto Nacional de Antropología e Historia in Mexico, D.F., and Ciudad Chihuahua. The work has been funded by the National Science Foundation (SBR-9708621O, SBR-9809839, and SBR-0219185) and by the National Geographic Society. The University of Texas at San Antonio provided two UTSA Faculty Research Awards, among other support, and the U.S. Bureau of Land Management has supported our work.

One of us (RH) held a National Endowment for the Humanities University Teachers Fellowship while this chapter was being prepared for publication. Christiane Cunnar of Human Relations Area Files at Yale University generously provided access to eHRAF. Joe Davis and Larissa Galenes assisted with technical aspects of the research. The detailed comments of two anonymous reviewers improved the chapter.

Appendix 2.1 Ethnographic Data

Group	Country	Fieldwork Years	Limited Option	Defensive	Agricultural	Environmental	Symbolic	Nonresidential	Monumental	Hill Height
Akan (Ashanti)	Ghana	1941–1946				X	X	Agricultural, markets, army assembly grounds	X	Low

Akan (Ashanti) towns are centered on the palace of chief; some are situated on hills, but most are on the plains. Kumasi, capital of the Ashanti kingdom, in the eighteenth and nineteenth centuries was on a low rocky eminence above a permanently wet valley, suggesting why hill living was preferred at this location. A highly decorated, huge palace was encircled by a decorated wall, and both are considered monumental. Ashanti conducted wars of conquest with competing chiefdoms and fought the British. The British built a fort at Kumasi in the late nineteenth century, but prior to this there is no evidence that Kumasi hill location was defensive, although Hull (1976) suggested surrounding marsh was defensive. When the British abolished the office of the Ashanti priest-king and destroyed the symbolic fetish at Krobo Hill, the capital of Manya-Krobo state and residence of the priest-king, people abandoned Krobo Hill and settled at the foot of the hill, suggesting the hill location was tied to the symbolic value of location.

Alor	Alor, Indonesia	1938–1939		X		X				100–150 m

Alor located villages on mountain spurs and ridges for safety during warfare prior to Dutch pacification in 1918, although water must be transported up. After pacification, the government insisted villages relocate to the valley floor, although the lower elevations are colder, causing discomfort.

Appendix 2.1 Continued

Group	Country	Fieldwork Years	Limited Option	Defensive	Agri-cultural	Environ-mental	Sym-bolic	Nonresi-dential	Monu-mental	Hill Height
Amhara	Ethiopia	1946–1970	X					Terrace agricul-ture, churches, markets, forts, grazing		

Amhara live on the deeply incised Shoan plateau that leaves only ridgetops for settlements and most other structures. Hilltops and hillsides are also preferred to avoid rainy season flooding. Substantial warfare, but no indications settlements were located for defense.

Andamans	India	1906–1908		X				Lookouts		

Jarawa Andamans prefer to make camps on hills or ridges, clear vegetation, and post a look-out for enemies.

Aymara	Bolivia	1937–1969	X		X			Herding, hills have named spirits, shrines of stones		

Aymara live in the steep Andes Mountains, and land suitable for farming is scarce. Scattered homes built on agricultural terraces are watered by mountain springs. Prehispanic hilltop fortified towns are not considered a case here, as they are not Aymara and not well understood.

Basques	Spain	1976–1981	X		X			Herding, schools, churches, hermi-tages, foundries for wind, mountain fortifica-tions		

Basque farmsteads are scattered on mountainsides in Pyrenees and Cantabrian Mountains. Some communities are built on hillocks. Apparently there is limited bottomland, as two-thirds of the land is mountainous. Mountain herder huts are used. Special buildings are placed on hilltops. In 1936 Basque separatists fortified themselves on summit of Mt. Intxorta.

Buka	Bougainville	1929–1930	X[a]	X[b]		X[a]				

Buka living (a) on the coast, where raiding had ceased, utilized cliff top locations in order to watch for schools of bonito and/or when insufficient land was available along beach to escape very high waves. (b) In the interior, where raiding was still prevalent, hamlets are positioned on hilltops and hidden from sight by thick brush.

Copper Inuit	Canada	1908–1916		X		X		Hunting lookouts		

Copper Inuit's numerous summer base camps, which Stefánsson visited, were placed on hills for fear of Indian attack, to watch for caribou, and to avoid mosquitoes. Tents were camouflaged for fear of attacks. All later visitors reported summer camps down low by rivers.

Appendix 2.1 Continued

Group	Country	Fieldwork Years	Limited Option	Defensive	Agri-cultural	Environ-mental	Sym-bolic	Nonresi-dential	Monu-mental	Hill Height
Dogon	Mali	1931–1989	X	X	X	X	X	Terrace agricul-ture, ritu-als, priest house, temple, lookouts		300 m

Dogon villages are sometimes walled, and many are located on plateaus behind narrow gorges and on mountain scree slopes for defense against slave raiding. Since British pacification in the late nineteenth and early twentieth centuries, many more villages were spread out on plains and plateaus; but mountain rims and slopes were still occupied. They provided access to water and agricultural fields, had symbolic value, and were used when other locations were filled. These scree and mountain rim villages now attract tourists (1980s). Elaborate priest's houses are isolated from villages high on hills, contain symbols of political alliance, and are loci of rituals.

Eastern Toraja	Indonesia	1892–1932		X				Agri-culture, spirits		

Eastern Toraja made extensive use of hilltop, fortified, defensive villages. However, people lived on farms and occupied fortified villages only during raids. Following Dutch intervention in 1905, Toraja moved their villages to valley bottoms.

Ganda	Uganda	1900–1972	X					Agri-culture, ritual centers, shrines, temples, churches	X	Low

Ganda. Around Lake Victoria is swampland, leaving innumerable low, flat topped hills as dry land. Throughout the twentieth century, villages were constructed on hill slopes, as the hilltops were too rocky. The settlements consisted of scattered homesteads surrounded by fields. In early 1900s substantial warfare but appears unrelated to village locations or hilltop defense. At same time chiefly capitals or palaces were frequently relocated to various hills and encircled by reed fences several miles long. These classified as monumental here. Modern Kampala constructed on a series of hills.

Garo	India	1908; 1936–1983		X[a]		X[b]		Agri-culture, temples, altars, spirits		high[a]/ low[b]

Garo. (a) Prior to British pacification in 1876, Garo aggregated in large villages on high hills and participated in head hunting and raiding. Some villages were fortified with pointed bamboo stakes. (b) After pacification, Garo live in small villages on low hills to avoid soil moisture along drainages.

Appendix 2.1 Continued

Group	Country	Fieldwork Years	Limited Option	Defensive	Agricultural	Environmental	Symbolic	Nonresidential	Monumental	Hill Height
Hadramaut	South Yemen	1918–1951		X				Terrace agriculture, fortifications, garrisons	X	60–100 m

Hadramaut have numerous hilltop settlements including fortified towns, cities, sultans' capitals, fortified sultans' residences, military fortifications, garrisons, and watchtowers. Many hilltop settlements were occupied in the early twentieth century. High-bastioned walls surround some settlements and are visible at a distance. Battlements, palaces, custom houses, and mosques are the most visible buildings. In some cases fortified sultans' palaces and/or military garrisons are on high hills with corresponding villages built below against slopes. Numerous hilltop ruins represent centuries of use. Conflicts involve competing chiefdoms, blood feuds, and caravan raids. Conflicts ceased by ca. 1950.

Highland Scots	Scotland	1919–1959; 1981	X		X			Grazing huts, community structures		

Highland Scots sometimes build houses and scattered farms on hills and hillslopes because the region is mountainous. Sometimes towns expand up mountain slopes.

Hopi	USA	1890–1995		X	X	X	X	Terrace agriculture, shrines, spirits		120 m

Hopi settled on mesa tops for fear of Spanish revenge after pueblo revolt of 1680. Hopi pueblos have symbolic values and provide access to a range of agricultural strategies as well as springs. They are also ceremonial centers. Although many people have relocated to the base of the mesas, many others have remained on the mesa tops.

Iban	Borneo	1861; 1915		X				Agriculture		High

Iban, in 1861, retreated to a fortified settlement on the 3,000-ft summit of Sadok Mountain to resist British attempts to pacify Iban headhunting. There is a similar report from 1915. Iban normally built longhouse settlements on low terraces.

Ifugao	Philippines	1868–1941; 1961–1965			X			Terrace agriculture, rituals		

Ifugao rancherias are constructed on mountainside terraces to be close to irrigated, terraced fields that can rise thousands of feet up steep mountainsides. Extensive blood feuds and headhunting occurred until 1908, but settlement locations appear not to be defensive. Rice terraces are visually impressive. During WWII, Japanese built fortifications high in mountains of Ifugaoland, and families would also hide in mountains.

Appendix 2.1 Continued

Group	Country	Fieldwork Years	Limited Option	Defensive	Agri-cultural	Environ-mental	Sym-bolic	Nonresi-dential	Monu-mental	Hill Height
Inca	Peru	1532–1560; 1610; 1940s	X	X	X			Terrace agricul-ture, field houses, herding struc-tures, shrines, temples, garrisons, observa-tories, roads	X	High

Inca of ca. 1500–1650 lived on extensive terraced fields, had mountain-top fortified cities and towns, and lived on hillsides to conserve level land for farming. Extensive ethnohistory and archaeological data.

Iroquois	USA	1844–1859; 1933–1950		X				Ceme-teries	X	

Iroquois constructed palisaded villages from ca. 1000–1700s that were frequently located on hilltops or elevated terraces away from major waterways. Council houses are considered monumental based on scale, labor investment, and visibility. By mid-to-late 1700s, many Iroquois (e.g., the Seneca) were no longer threatened by warfare and lived in unpalisaded, smaller villages along river flats.

Khasi	India	Pre-1830s; 1872; 1910–1911; 1955–1958	X[b]	X[a]	X[b]	X[b]		Agri-culture, crema-toriums, ancient monu-ments, sacred groves, markets		

Khasi. (a) Prior to British pacification in 1830s, there was substantial Khasi warfare, and settlements were located on hills with fortifications. (b) Late 1800s to present: villages located on hill slopes, as there is an apparent absence of flat land. Preferred locations were below summits for protection from wind. Hillsides around villages are farmed. Massive stone monuments and crematoriums built on hilltops as late as 1800s and probably for centuries before.

Appendix 2.1 Continued

Group	Country	Fieldwork Years	Limited Option	Defensive	Agricultural	Environmental	Symbolic	Nonresidential	Monumental	Hill Height
Korea	Korea	1883–1932; 1965		X				Terrace agriculture, ancient defensive refuges, fortified temples, shrines, graves	X	High

Korean case refers to ancient to nineteenth-century urban centers, including Seoul, Heizanchin, An-byong, Kaisong, and Hwang-ju, that are located on elevated hills surrounded by steep mountains and encircled with huge, fortified city walls. Gates are elaborate, decorated affairs and considered here to be monumental. Temples and palaces are also considered to be monumental. Elite offices and residences were built on hillslopes. Defensive constructions were built and used over centuries during Korean, Chinese, and Japanese conflicts ca. 1500s–1700s. Some of these locations were defensive refuges and occupied only during war. In contrast, Korean farming villages, from the late 1800s to the present, are located on valley bottoms and lower slopes of mountains providing protection from wind and access to fields. Lower slopes are used to a greater extent when valleys are very narrow. Hilltops and hillsides used extensively for shrines, graves, and temples.

Kuna	Panama	1935–1936				X		Agriculture, cemeteries		30 ft

A Kuna riverside village is located on 30-ft-high bluff above river to escape danger of flooding river.

Kurds	Iraq	1946–1957		X				Agriculture, shrines	X	

The Kurd case refers only to ancient fortified cities, capitals, and towns built on hilltops and cliffs, although many are still occupied. Examples include an immense palace complex that was built in 1748 on a rocky outcrop opposite Mt. Ararat, with domes, minarets, monumental gates, and multilevel courtyards that are considered monumental here. In addition the town of Rowanduz was built on a defensible bluff after it was destroyed in WWI. During Iran-Iraq war in 1980s 30–40-ft-high watchtowers were built on hill summits. Agricultural villages are also built on the lower part of steep slopes below springs. Summer temporary huts are built on terraced hillsides for coolness.

Lau Fijan	Fiji	1924–1934		X				Great temple located at hilltop fortress		840 ft

Lau Fijans abandoned fortified villages on peaks of hills and cliffs following European settlement and cessation of warfare in the middle of the nineteenth century. Hill settlements were then relocated to flats.

Luo	Uganda	1900		X				Rituals, ceremonial structures		High

Luo villages are built high up on the hillsides for protection against hostile clans.

Appendix 2.1 Continued

Group	Country	Fieldwork Years	Limited Option	Defensive	Agri-cultural	Environ-mental	Sym-bolic	Nonresi-dential	Monu-mental	Hill Height
Maori	New Zealand	1870–1920		X					X	

Maori built about 6,000 fortified hill villages between ca. fifteenth century AD and ca. 1850. Ethnohistorical and archaeological sources describe their use and construction. Many times hilltop fortified sites served as citadels for a dispersed and mobile settlement pattern. At times fortified sites were chiefly centers. Cases include occupation on a permanent basis as well as only in response to threats. Many include concentric palisades, terraces, ditches, firing platforms, gateways, and storage pits. Carved posts, as tall as 30 ft, with decorated images named after ancestors with defiant symbolism are classified as monumental here. Most fortified sites were abandoned shortly after European contact in late 1700s, but some continued to be used as late as ca. 1850 and involved Maori use of firearms and conflict with Europeans.

Maya	Mexico	1932–1936		X				Agricul-ture		120 m

A Maya rebel group established headquarters on the bamboo palisaded hill of Icaiche ca. 1853 after other Maya formally submitted to Mexican government. Icaiche Maya resisted British expansion in the Yucatan in the late 1800s. The village was still occupied in 1889 but abandoned by 1932.

Mbuti	Congo	1970–1973				X				

Mbuti temporary honey camps are located on steep hills.

Miao	Thailand	1895; 1921–1941	X	X	X			Agri-culture, sacred trees, field houses		

Miao live in mountainous terrain with few level areas. However, in hostile regions of the mountains, they also selected defensible village positions, including slopes with a difficult approach, small mountain spurs, or platforms cut into side of mountains. Miao stated that they preferred the mountains to the lowlands. These Thai Miao had migrated from mountainous area of central China and settled in mountainous area of Thailand where lowlands were already occupied. Field houses were built on slopes in rice fields.

Okinawa	Okinawa	1951–1961	X[b,c]	X[a]	X[b,c]			Terrace agricul-ture, shrines, sacred groves, priestess' dwelling	X[a]	

Okinawa has three contexts of hilltop residence: (a) In thirteenth to sixteenth centuries, with emergence of warring chiefdoms, fortified castles established on hilltops. These are considered monumental here as they were decorated with elaborate gates and lacquered fencing and are now ruins. (b) In 1724 increasing population of unemployed upper class were allowed to settle in unused hilly country. There they established villages, known as yaadui, on hilltops, apparently due to limited options. (c) In northern Okinawa, due to limited flat land, villages have been built on tops of low rolling hills for centuries.

Appendix 2.1 Continued

Group	Country	Fieldwork Years	Limited Option	Defensive	Agri-cultural	Environ-mental	Sym-bolic	Nonresi-dential	Monu-mental	Hill Height
Pawnee	USA	1928–1954		X		X		Ceme-teries, home of sacred animals, lookouts, sacred bundles placed on hills		High

Some Pawnee villages were fortified with sod walls and constructed on high bluffs above rivers primarily in defense from Sioux during the first half of the nineteenth century. The evidence includes ethnohistoric, oral history, and archaeological sources. By mid-nineteenth century, Pawnee relocated to reservations. The fortifications were still visible in the early 1900s. Weltfish's (1965) informant from 1928–1936 on the Pawnee Reservation indicated living in hilltop villages was considered to be more healthful.

Pomo	USA	1903–1918	X							

Pomo villages tend to be located on ridge slopes and crests as a product of deep canyons and little level land in the Sierra Nevada.

Rundi	Uganda; Rwanda; Burundi	1911–1925; 1949–1951	X		X			Terrace agricul-ture, royal ceme-teries		

Rundi settlements tend to be on mountain ridges and higher slopes of valley because valley bottoms are swamps and lower slopes are steep.

Serbs	Yugoslavia	ca. 1914; 1922; ca. 1950			X			Agri-culture, ceme-teries, shrines		

Serb settlements in the 1920s are on hills and on river and high alluvial terraces that are dissected with river gorges in the Jassenica region. In the 1950s some elevated locations are abandoned in favor of settlements near valley-bottom roads to participate in commerce.

Shluh/ Berbers	Morocco	1920–1928		X				Mauso-leums		

Shluh/Berbers' hamlets, villages, and leaders prefer to construct fortified settlements on hilltops. Also present are fortified communal storage structures.

Siwan	Egypt	1899–1927		X				Ancient tombs	X	

Siwa, the principal town, was constructed on the summit of two limestone hills by an oasis. Siwa is fortified with a continuous wall that originally had only a single gate. Rooms constructed in "pueblo" fashion about 3 to 8 stories. Eight mosques with minarets are in town and are considered monumental. By early 1900s settlements were spreading out on adjacent plains. Now the city is at base of hill, and Siwa ruins on hilltop attract tourists. Some smaller fortified towns and villages were constructed on precipitous cliffs. The town of Aghurmi is built on a high, precipitous rock and is walled with a single gate.

Appendix 2.1 Continued

Group	Country	Fieldwork Years	Limited Option	Defensive	Agricultural	Environmental	Symbolic	Nonresidential	Monumental	Hill Height
Slovenes	Slovenia	1964–1965		X				Churches, old fortifications	X	

Slovenes built castles and fortifications on hilltops (now in ruins) because they were involved in conflicts with invading Turks and warring city-states in the 1400s. However, old hilltop churches remain in use.

Tanala	Madagascar	1926–1927		X				Rituals		

Tanala, 50–75 years ago (before 1926), lived in villages of 50–80 families in defensive positions, usually on hilltops, and fortified by 10–12-ft-high log palisades and deep ditches. The houses were built on 1.5–2.5-ft-high terraces or stone-faced platforms. The Tanala now live on the flats.

Tarahumara	Mexico	1891–1998; 1930–1989	X		X	X		Agriculture, herding, field houses		

Tarahumara construct rancherias in dissected canyon region on narrow ridgetops and farm hillsides due to absence of valley bottoms. In uplands, some winter houses are placed on ridgetops for better solar exposure and access to firewood.

Tzeltal	Chiapas, Mexico	1925				X		Agriculture, shrines, churches		Small

Tzeltal build scattered, isolated houses on small prominences in hilly pine country where slash and burn agriculture is practiced. Reasons given include drainage and being able to watch for strangers. Nearby prehispanic high terraced hills that form pyramids are not considered.

Appendix 2.2 Bibliographic Sources for Appendix 2.1

Group	Sources
Akan (Ashanti)	Busia 1951; Fortes et al. 1947; Hull 1976; McLeod 1981; Meyerowitz 1974; Steel 1948
Alor	Du Bois 1944
Amhara	Buxton 1949; Hoben 1973; Messing and Bender 1985
Andamans	Radcliffe-Brown 1922
Aymara	Bouroncle Carreón 1964; Buechler and Buechler 1971; Carter 1965; La Barre 1948; Tschopik 1951
Basques	Milbrath 1986; Ott 1981; Turnbull 1981; Urla 1987; Zirakzadeh 1985; Zulaika 1988
Buka	Blackwood 1935
Copper Inuit	Jenness 1959; Stefánsson 1914
Dogon	Beek 1990; Cazes and Jacquard 1981; Griaule and Dieterlen 1986; Palau Marti 1957; Parin et al. 1963; Paulme 1940
Eastern Toraja	Adriani and Kruyt 1950; Downs 1956
Ganda	Apter 1967; Fallers 1964; Fallers 1960; Kagwa et al. 1934; Kiwanuka 1972; Mair 1934; Ray 1991; Richards 1966; Roscoe 1911
Garo	Burling 1963; Choudhury 1958; Khaleque 1988; Playfair 1909; Rongmuthu 1960; Sinha 1966
Hadramaut	Ingrams 1938; Meulen and Wissmann 1932; Sturler-Raemaekers 1953
Highland Scots	Darling 1955; Geddes 1955; Gregor and Crichton 1946; Moisley 1962; Stephenson 1984
Hopi	Clemmer 1995; Courlander 1982; Ellis 1974; Talayesva and Simmons 1942; Titiev 1971
Iban	Pringle 1968; Sandin 1967; Wagner 1972
Ifugao	Barton 1922, 1938; Beyer and Barton 1911; Conklin 1967; Dumia 1979; Kwiatkowski 1994; Lambrecht 1929, 1932, 1957; Villaverde and Case 1909
Inca	Cieza de Leon 1883; Cobo 1893; Rowe 1946; Vega 1871
Iroquois	Blau et al. 1978; Fenton and Tooker 1978; Morgan 1901; St. John 1981

Appendix 2.2 Continued

Group	Sources
Kashmir	Drew 1875
Khasi	Becker 1924; Department of Economics and Statistics, Assam, Shillong 1963; Godwin-Austen 1876; Gurdon 1907; McCormack 1964; Nakane 1967; Stegmiller 1921
Korea	Andrews 1919; Bishop 1898; Bonar 1883; Brandt 1971; Carles 1888; Clark 1932; Hulbert 1906; Lee 1936; Moose 1911
Kuna	McKim 1947
Kurds	Barth 1953; Hansen 1961; Izady 1992; Johnson 1940; Masters 1953; Roosevelt 1947
Lau Fijan	Bryan 1924; Thompson 1940
Luo	Roscoe 1915
Maori	Bellwood 1971; Best 1924; Davidson 1987; Firth 1959; Groube 1970; Smith 1990
Maya	Villa Rojas 1945
Mbuti	Turnbull 1962
Miao	Abadie 1924; Bernatzik 1970; Diguet 1908; Graham 1937; Ling and Ruey 1947; Robequain 1929; Wang 1948
Okinawa	Glacken 1953; Kerr 1958; Ladefoged and Pearson 2000; Lebra 1966; Pitts et al. 1955; Sakihara 1987; Tanaka 1974
Pawnee	Hyde 1974; Murie 1914; Wedel 1936; Weltfish 1965; Wishart 1979
Pomo	Barrett 1908; Kniffen; 1939; Kroeber 1953
Rundi	Maquet 1961; Meyer 1916; Pagès 1933; Smets 1946
Serbs	Drobnjaković 1973; Filipović 1954
Shluh/Berbers	Dupas 1929; Montagne 1930
Siwan	Belgrave 1923; Cline 1936; Stanley 1912; Steindorff 1904
Slovenes	Winner 1971
Tanala	Linton 1933
Tarahumara	Bennett and Zingg 1935; Hard and Merrill 1992; Kennedy 1978; Lumholtz 1902; Pennington 1963
Tzeltal	Blom and La Farge 1927

3

Tumamoc Hill and the Early Pioneer Period Occupation of the Tucson Basin

Henry D. Wallace, Paul R. Fish, and Suzanne K. Fish

The origin of this chapter lies in a deceptively simple question and a long-standing but friendly professional debate. The question is: why on earth would anyone want to live atop Tumamoc Hill? The dispute lies in the answer, with one of us (Wallace) asserting that warfare and the requirements of defense were the prime motivation for a move to the hilltop, and two of us (Fish and Fish), suggesting specialized functions other than defense. With the Fishes' recent and previous (Fish et al. 1986) excavations atop Tumamoc Hill providing critical dating and subsurface data, and Wallace and Lindeman's (2003) excavations at Valencia Vieja (a partially coeval riverine settlement not far to the south), the authors thought this an opportune time to reexamine our perspectives on Tumamoc and its role in Tucson Basin prehistory. In the process, we refine and clarify our views, and we come to a consensus on some points. Data from the recent excavations atop Tumamoc Hill are reported here for the first time.

Many researchers have favored a primarily defensive motivation for trincheras construction; others have posited single or combined residential, agricultural, ceremonial, and signaling functions (Downum et al. 1994; Fish et al. 1994; Fontana et al. 1959; Hard and Roney 1998; Hoover 1941; Larson 1972; McGuire et al. 1999; Sauer and Brand 1931; Stacy 1974; Wallace and Doelle 2001; Wilcox 1979). Many now acknowledge some combination of these functional designations for at least the larger more complex sites. Until recently, archaeologists have assumed that most Arizona trincheras sites postdated AD 1200. For some sites in the Tucson Basin, such as Linda Vista Hill and Cerro Prieto (Downum, this vol.; Downum et al. 1994), this assumption was backed up by evidence from surface collections and excavations. In most cases, however, the inference was built on a weak association with nearby villages