

Warfare and the Evolution of Culture

Jonathan Haas
MacArthur Curator
Department of Anthropology
The Field Museum
Roosevelt Rd. at Lakeshore Dr.
Chicago, IL 60605

External Professor
Santa Fe Institute
1399 Hyde Park Rd.
Santa Fe, NM 87501

Warfare is perhaps the ugliest and most repugnant of all human cultural adaptations. It has its roots in the demographic and economic changes of the Neolithic revolution and its blighted branches continue to darken skies across the globe in the contemporary period. The conduct of war has had a profound impact on the trajectory of cultural systems in virtually every corner of the world. Today it has evolved to the point that it stands as the biggest single threat to the survival of humanity on the face of the planet. The importance of warfare in human affairs has made it the focus of intense research in a wide range of disciplines from biology to history, psychology and political science (see Bremer and Cusack 1995; Eibl-Eibesfeldt 1979; Wright 1965). Each discipline adds a different dimension to our understanding of the causes and role of warfare in the past, present and future of the human species. Archaeology makes specific contributions to the study of war in two ways: First, archaeology provides insights into the origins and evolution of war extending thousands of years back into the prehistoric past. Second, archaeology provides a diachronic perspective on the causes and effects of war in many different kinds of societies over very long periods of time.

By looking back across long stretches of time, archaeology offers the advantage of being able to examine patterns in the development of warfare in circumstances very different from those found in either the contemporary or historic worlds. If the vision of social science is restricted to historic and contemporary records, then we are led to the almost inevitable conclusion that warfare is ubiquitous and inevitable in the human species. Ethnographically, anthropologists have given accounts of some level of organized warfare in most societies around the world from the simplest to the most complex (Ember and Ember 1992). Warfare is even more prevalent in the written record of history. Indeed warfare often provides the guideposts of history - e.g. the Revolutionary War; War of 1812, Civil War, WWI, WWII, the Vietnam War, the Gulf War, etc.

The Archaeology of War (and Peace)

The problem with relying on ethnography and written history to study warfare is that they only pertain to a period relatively late in the sequence of human occupation on the face of the earth.

The historic and modern records of warfare all come from a time when human society in all corners of the world has been dominated by large, state polities intimately involved in regional or global systems of economic competition. Even the least complex contemporary band and tribal societies of the nonWestern world have been significantly impacted by the aggressive dominance of Western colonialism for centuries (Ferguson and Whitehead 1994). The pervasive warfare we see today throughout the world, in all kinds of societies, is all taking place within the context of the ideological, economic, environmental and demographic relationships of the modern nation states and a global economy. Any inferences drawn from written history and ethnography about the causes and "inevitability" of warfare are dominated by the relatively recent circumstances brought about by the evolution and global spread of the nation state. Warfare may be ubiquitous in the modern and

historic worlds, but humanity has been around a lot longer than written history and the nation state. The first hominids diverged from their primate relatives in Africa several million years ago. The first modern homo sapiens in turn emerged also in Africa several hundred thousand years ago, and soon migrated across most of Africa, Europe and Asia. Looked at from the perspective of several hundred thousand years of human occupation of the planet, the last five to six thousand years of written history begins to lose its stature as a indicator of what is natural or inherent in the humans species. For an alternative perspective on why wars start and long-term patterns of both war and peace in the evolution of cultural systems, we must look back into the more distant, prehistoric past.

Within this context archaeology comes to play a central and complementary role in the social sciences by helping to understand the causes and consequences of warfare and ethnic conflict across cultures and across time. It is archaeology and the archaeological record that hold the most appropriate intellectual resources to answer broad, pressing questions about the inevitable or intrinsic qualities of human warfare.

The nature of the archaeological record is both restrictive and liberating in studying war. It is restrictive in the sense of being very incomplete. Archaeologists study patterns of human behavior only indirectly through the material remains left behind as a result of that behavior. They have to rely on the treasures and detritus of the past to make inferences about how and why people acted the way they did. Some parts of the ancient past are more accessible through archaeology than others. For example, relatively sound inferences can be made about technology, settlement and subsistence through material remains, but it is increasingly difficult to extend those inferences to social structure, political organization and then on to beliefs and ideology (see Binford 1972). Reconstructing warfare stands somewhere in the middle of the two extremes. Direct manifestations of war can be identified in skeletal remains (projectile points stuck in rib cages, scalp marks on skulls, "parry" fractures on forearms). Weaponry can also be directly observed in the archaeological record, though it may often be difficult to distinguish hunting from war weapons. On the other hand, evidence of battles, war parties, and warrior organizations are another step removed from the material remains found in archaeology. The ideology of warfare and the personal motivations of warriors are even more difficult if not impossible to extract from the archaeological record.

While the evidence of archaeology is limited to the material remains of past human behavior, it is also liberated from some of the complications of history. Both written and oral history inevitably provide a biased perspective on events of the past. As those events are told or put down in writing, they are necessarily interpreted by the tellers and writers. The issue is particularly relevant in studying warfare as history is almost always written by the victors. (One can but imagine, for example, how historians would have explained the outbreak of World War II, had Germany

been victorious.) Without the detail and interpretive overlay of history, archaeology can effectively focus attention on diachronic patterns of human behavior rather than on specific events. The material record of archaeology also provides the empirical foundation for scientific explanations of the emergence and development of those prehistoric behavioral patterns. In terms of warfare in particular, archaeology can be most productive in the study of long term evolutionary patterns of social conflict through an explicit focus on material conditions reasonably reflected in the archaeological record, including environment, demography, technology, and economics. This is not to say that other, nonmaterial conditions do not affect the historical manifestations of warfare in any given society. But archaeology can provide valuable insights into the relative impact of material variables on the origins and development of warfare-related patterns across a broad array of prehistoric cultures.

In considering the origins of warfare among humans, it is necessary first to articulate a general sense of the meaning applied to the term. Ferguson (1984:5) has offered one of the most precise definitions of warfare in anthropology: "organized, purposeful group action, directed against another group that may or may not be organized for similar action, involving the actual or potential application of lethal force." Keeley (1996:x) has proposed a similar, but more succinct definition for warfare: "the armed conflict between societies." Both of these definitions include a broad range of human behavior from the organized campaigns of modern nation states to the raids and skirmishes of village horticulturalists. At the same time, they exclude a range of behaviors that may be similar in appearance to warfare but are structurally quite different. For example, various kinds of nonviolent competition between groups - "price wars" or Atrade wars@ - do not fulfill an anthropological definition of warfare.

Likewise, homicide and violence within a group do not meet the warfare criterion of intergroup conflict. Evidence of homicide or violence alone in the archaeological record, therefore, does not stand as a valid independent indicator of warfare.

What does constitute evidence of warfare in the archaeological record is a subject of some discussion. A number of scholars have addressed the question of how to identify warfare archaeologically (Venc1 1984; Haas and Creamer 1993; Redmond 1994; Wilcox and Haas 1994; Milner 1995; Keeley 1996). Although each offers a somewhat different set of criteria, there are general points of agreement. Without going into detail it is useful to enumerate the primary kinds of evidence commonly recognized as indicators of warfare in the archaeological record:

Settlement

- Defensive redoubts
- fortifications
- palisades
- lookout features
- strategic defensive locations

- overlooking access routes
- line-of-sight connections
- "no-man's-land" - unoccupied territory between group frontiers
- Burial information
 - mass graves
 - warrior graves
- Skeletal indicators
 - Aparry@ fractures (forearm breaks)
 - frontal head fractures
 - scalping marks
 - skewed distribution (more or fewer fighting age males, for example) of age and sex in burial population
- Site markers
 - burned communities
 - pillaging - deliberate destruction
 - physical signs of attack
- Warfare/military paraphernalia
 - warfare-specific weapons
 - specialized projectile weapons
 - swords
 - clubs
 - shields
 - body armor
- Artistic depictions of war
 - rock /art
 - ceramics
 - murals

Although not exhaustive, this list of potential material manifestations illustrates how warfare can be identified in the archaeological record before the appearance of written records. It can also be expected that in times of war the associated archaeological manifestations will tend to occur in clusters rather than as isolates.

Recognizing the absence of warfare archaeologically is somewhat more difficult. What does peace look like? It cannot necessarily be inferred that a society is at peace if all the markers of war are absent from some sample of the archaeological record. A small village in the middle of a large state, for example, might exhibit no indications of conflict of any kind; yet, the encompassing state polity might well be engaged in war in a much wider arena. Determining whether a given society is at war or at peace, ultimately, depends on a broad assessment of regional settlement, skeletal populations, artifactual assemblages and art. Historical patterns are also significant. Periods of war may be followed by periods of peace in cycles or "long waves" (Marshall 1987). In the archaeological record of a region then, signs of warfare may appear and disappear over long periods of time. Thus, as the presence of clusters of markers of conflict and defensive posturing is a measure of the presence of war, the absence or disappearance of such markers in the historical sequence of a society can be taken conversely as a measure of the reign of peace.

The Origins of War

The question of when warfare first appears in the archaeological record of humanity has some interesting philosophical implications. In the classic debate of Hobbes and Rousseau, the two polar positions hold that humans "in a state of nature" (meaning before the rise of states, governments, laws, etc.) were either engaged in constant warfare or lived in perpetual peace (see Haas 1982: 26-30 and Keeley 1996: 5-8 for a discussion of this philosophical debate). This is a basic philosophical argument over human nature and it is manifested in many modern discussions about whether or not humans are inherently aggressive and whether there are deep-rooted biological foundations underpinning intraspecies human conflict (Ardrey 1966; Lorenz 1966; Eibl-Eibesfeldt 1979; Montagu 1968, 1978; McCauley 1990). Archaeology makes an explicit contribution to the discussion by being able to provide an empirical record of the prevalence of war in the evolution of cultural systems prior to the emergence of complex, state-level polities.

The first signs of conflict or violence in the archaeological record appear in the Paleolithic. Between 20,000 and 30,000 years ago, skeletal remains with signs of violence - projectile points embedded in bone, depressed fractures on crania - have been found in rare, isolated cases in Paleolithic Europe and Egypt (Roper 1969; Keeley 1996:37; Wendorf and Schild 1986). Although there are no accepted human remains in the Western Hemisphere this early, there are similar isolated occurrences of violence in skeletal remains in the evolutionarily analogous PaleoIndian period from 7000 to 12,000 years ago. The recently discovered Kennewick Man in Washington state, for example, was found with an embedded projectile point (Henderson 1998).

Such data on violence and homicide among very early hunting and gathering populations provides only murky insights into behavior that may have been related to conflict or warfare. The number of cases of demonstrable violence is very small and spread out over a time span of more than 10,000 years. Each case is an isolated incident and never part of a larger pattern. There are no indications of defensive settlement strategies or any of the other markers of warfare. But then again, such markers would be extremely hard to detect in low density, nomadic populations living 20-30,000 years ago. Available data are inadequate to determine whether these were historically unique and idiosyncratic events representing homicidal behavior within a community or manifestations of broader intergroup conflict. Based solely on the paucity of evidence, it cannot be inferred that warfare was absent in Paleolithic populations, though the rarity of cases would indicate that any conflict in the Paleolithic was at most episodic and infrequent. Conversely, the evidence certainly does not support the idea that warfare was a ubiquitous and inevitable part of the human cultural landscape of early modern humans. The few cases of skeletal trauma ultimately constitute an insufficient body of evidence to assess whether the origins of human warfare extend in any significant way back before 15,000 years ago (or

into the PaleoIndian period in the Americas).

Moving up in time there is clearer evidence for warfare during the time immediately preceding the development of settled village agriculture. However, the manifestations of conflict among preagricultural hunters and gatherers is still highly episodic. In Europe, for example, there is another small handful of cases of skeletal trauma and individuals killed by projectile points coming from Mesolithic sites dating between 10,000 and 20,000 years ago (Vencl 1991). There are also occasional depictions of what has been interpreted as possible warfare in European rock art from this period (Haddington 1969; Ferrill 1985; Watkins 1989). In Australia there are depictions of conflict in rock art dating back to 10,000 B.P. (Tacon and Chippendale 1994). In Egypt, a repeatedly used cemetery at the site of Gebel Sahaba (12,000 to 14,000 BP) contains the clearest evidence for warfare during the time from 14,000 to 12,000 B.P. (Wendorf 1968). Of the 58 individuals recovered from this cemetery, 24 appear to have been killed by projectile weapons (points penetrating skulls, embedded in bones, etc.). Fractures of the forearms, consistent with "parry" fractures, were the most common pathology in the skeletal population (Anderson 1968). No habitation site has been located anywhere near this cemetery, and it is unique for this time period in terms of the number and density of individual inhumations in a single concentrated location.

The Archaic period(roughly 10,000 to 4,000 B.P.) in the Americas, where the developmental sequence is pushed up several thousand years in time, also shows evidence of conflict. In South American there are possible defensive features (walls and slingstones) in two known Preceramic sites along the coast (Topic 1989) and violence manifested in skeletal remains at a third coastal site (Engel 1963). The signs of warfare in each of these isolated cases are equivocal and not reinforced by additional corroborating markers of warfare. The North American Archaic record reveals less equivocal and somewhat more frequent signs of conflict. In the Eastern Woodlands and particularly in the southern U.S., skeletal remains with embedded projectile points occur with some frequency in shell midden sites dating to the period from 4,000 to 7,000 B.P. (Milner 1995, 1997). There is also evidence of possible scalping in some late Archaic sites in the Southeast (Smith 1995). The West Coast also has a pattern of warfare related violence - primarily frontal bone cranial injuries - at shell midden sites dating from 3000 to 7000 B.P. (Walker 1989).

Collectively the body of evidence for warfare before the onset of agriculture and the associated patterns of sedentism and surplus production is small but undeniable. There seem to have been at least isolated incidences of human conflict that left behind limited but measurable markers in the archaeological record. The data from this period are ultimately insufficient to assess the relative intensity of war or nature of conflict at any given point in time. The relative infrequency of violence in human skeletal remains and the absence of other kinds of non-skeletal markers in the archaeological record carries a number of additional implications. In particular, it is impossible to infer that

warfare was endemic or ubiquitous in the preagricultural epoch of human cultural development. The Hobbesian view of humans in a constant state of "Warre" is simply not supported by the archaeological record. ("...during the time men live without a common Power to keep them all in awe, they are in that condition which is called Warre" [Hobbes 1968].) Also, the causes of war, those material and nonmaterial factors that provoke societies to go to war, appear to have cropped up only fitfully in the lives of early hunters and gatherers. These populations in general appear not to have had the kinds of population densities, resource shortages, and ethnic diversity that came to play important roles in stimulating warfare in later periods. Just why people did go to war in this early time period remains difficult to tease out of the archaeological record. Available data are generally insufficient to make the kinds of explicit inferences about demography, economics, health, and environment that are central to most systematic explanations offered for the onset of war either ethnographically or archaeologically for later time periods (Ferguson 1984a, 1990; Haas 1990; Reyna and Downs 1994; Haas and Creamer 1993; Keeley 1996: 113-126; Ember and Ember 1992).

Nevertheless, there does seem to be one factor that is common to most if not all the cases of conflict in the time before the rise of agriculture: some degree of residential stability. At the site of Gebel Sahaba in Egypt, for example, although the economy was apparently based on hunting and gathering, the cemetery itself is a reflection of stability. The cemetery is adjacent to the Nile River and no associated residential camp or community has been located (Wendorf 1968). However the repeated use of the cemetery and the unusually large number (58 - the largest in the world known for this time period) of individuals interred there indicate a repetitive and persistent use of the area by a community over a very prolonged period of time. The large percentage of individuals with signs of perimortal trauma (Anderson 1968) indicate either that conflict took place at the site repeatedly or that casualties were brought back to this one site from battlegrounds some distance away. With either scenario, the community using the cemetery established a lasting affinity to this specific location (see Clark 1971).

A similar kind of stability is found in other early sites with manifestation of conflict. As noted above, most of the examples of skeletal trauma in the southeastern U.S. come from individuals buried in and around shell middens indicative of prolonged or repeated residence (Milner 1997). These midden sites represented concentrations of relatively stable food resources and were particularly attractive to foraging groups (Smith 1986, 1989). The Peruvian sites with manifestations of violence or defensive features are also associated with stable settlements based on exploitation of localized abundant marine resources (Topic 1989 and Engel 1963).

The occurrence of archaeological markers of conflict at sites with incipient residential stability would indicate that territoriality played a role in these early cases of warfare. With some locales significantly more productive than others, under certain

environmental and demographic conditions there would be positive economic reasons for both defending and attacking those locations. Conflicts over "possession" of productive natural resource zones might be expected specifically under conditions of population pressure or environmental degradation. Where there is too little food for too many people, the differential distribution of scarce resources on the landscape would lead to competition for the more productive zones. Conflict would have been one alternative manifestation of that competition.

In the few cases where conflict did arise in early hunting and gathering societies it does not appear to have played a significant role in the evolutionary development of those cultural systems. In his classic study of the Yanomamo, Chagnon notes that warfare "affects all aspects of their social organization, settlement pattern and daily routines" (1983:5). As discussed below, warfare in later periods has such an impact on the development of cultural systems in patterned and predictable ways.

It affects settlement patterns as people move into defensive postures; social interaction as people unite and separate for military reasons, and community organization as new roles and lines of authority emerge. While there are certainly changes in settlement, interaction and organization in the development of early hunting and gathering groups (see Straus, et al. 1996; Moore 1985; Price and Brown 1985; Renouf 1991; Bettinger 1991, these changes are not correlated positively or negatively with the relatively rare instances of conflict manifested in the archaeological record. War in the initial stages of human cultural development appears to have been ephemeral and ad hoc. Although it undoubtedly played an important role in the lives of the people engaged in the conflict at the time, there is no evidence that it had a significant causal impact on the pattern of development in the evolution of early hunting and gathering societies.

War in the Neolithic

The foundations for endemic and persistent warfare are to be found in the Neolithic with the development of agriculture and associated growth of population around the globe. ("Neolithic" is applied here in a very general sense to encompass the time between the transition to agriculture and the emergence on the first complex, state-level societies in a given world area. This transition took place at different times in different places and of course some areas never developed agriculture or experienced the indigenous development of states.) Growing bodies of data gathered over the past 20 years coupled with a conscious effort by archaeologists to study prehistoric warfare (see Keeley 1996: vii-x) have revealed manifestations of warfare in the archaeological record of Neolithic cultures in almost every area of the world. The evidence for Neolithic warfare is also much more prevalent and compelling than it was for earlier periods. Archaeologists have recovered cases of single warfare related events such as massacres and raids (Zimmerman, et al. 1981) as well as broad regional patterns of endemic warfare lasting centuries (Walker 1989; Lambert and Walker 1991; Keeley and Cahen 1989; Underhill 1989; Willey 1990; Wilcox and Haas 1994). This record of warfare before the appearance of state societies in turn

convincingly refutes the Rousseauian notion of a peaceful past that was somehow corrupted by the agencies of government (Rousseau 1964). Clearly there was strategic, intense, bloody, and fatal warfare in Neolithic societies without any influence from more complexly organized outside states.

While acknowledging the presence of warfare in Neolithic societies, it is important to recognize that warfare comes and goes in any given local record of long-term occupation. There are also significant contextual patterns in the appearance and disappearance of war in any given sequence. The first appearance of warfare in the historical sequence of an area often coincides with the initial transition from a mobile hunting and gathering subsistence strategy to more sedentary strategy of more intensified production of domesticated resources (or intensified procurement of concentrated natural resources such as shellfish). The southwestern U.S. provides a good example of the ebb and flow of Neolithic warfare. The area is a good archaeological laboratory as huge areas have been intensively surveyed in the Southwest and thousands of sites have been excavated to provide a well-dated regional culture history (Cordell 1997; Plog 1997).

The first signs of warfare in the Southwest come during the transition out of the Archaic into the "Basketmaker" period at roughly 2500 B.P. to 1500 B.P. This was a time when the people living in the northern Southwest were moving from full-time hunting and gathering to a semi-sedentary lifestyle based on a combination of domesticated maize and wild resources (see Powell 1983; Irwin-Williams 1973; Matson 1991; Wills 1989). The archaeological record of the period exhibits signs of sporadic conflict primarily in skeletal remains. Scalps and scalped heads have been recovered along with contemporaneous (if somewhat equivocal) depictions of scalps in rock art (Matson and Cole 1994; Hurst and Turner 1993). Skulls with fractures consistent with warfare have been recovered from a number of sites at this time period as well as individuals with projectile points embedded in bone or within the head or body (Wilcox and Haas 1994). Significantly, with very rare exceptions, the sedentary residential sites from this time period are not located in defensive or defensible positions (Matson and Lipe 1978; Plog 1986; Dean, et al. 1978; cf. Matson 1994; Rohn 1975). The overall pattern of Basketmaker warfare is one of widespread but episodic violence aimed at individuals, rather than raiding for resources or conquest.

Following this transitional period, the people in the northern Southwest came to adopt a more fully sedentary economy based on the classic New World trilogy of maize, beans and squash. The period from approximately 1500 to 800 B.P. was one of relative peace throughout the northern Southwest. There continue to be scattered and infrequent markers of isolated conflict in the region. There are short periods, for instance, when the homesteads of one valley are all surrounded by stockades (see Hall 1944), and a handful of homes appear to have been deliberately burned. The vast majority of thousands of surveyed and excavated residential sites dating to this period are not defensively

located and show no signs of raiding or burning. Similarly, out of the thousands of skeletons recorded, warfare related violence is present, but extremely rare. (The special case for cannibalism is not included here. There is a growing body of evidence of widespread cannibalism in the northern Southwest during the period from about 1000 to 800 B.P. [Turner 1989, 1993; Turner and Turner 1992, 1995; White 1992; Billman, et al. n.d.] Interpretations of the context and causes of the cannibalism have been widely divergent, but it is not clear at this time whether it is an internal mechanism of social control or an act of war aimed at enemies.) Looking at the region as a whole at this time, warfare may have cropped up sporadically at the local level, but did not have a significant impact on the trajectory of culture change at the regional level.

Warfare reemerged as an important component of the cultural landscape in the northern Southwest in the 12th and 13th centuries A.D. During a relatively short span between A.D. 1150 and 1300, signs of warfare proliferate markedly. Sites are located in highly defensible positions, stockades are widespread, many more sites are burned and exhibit signs of pillaging, skeletal markers of warfare-related violence are common, and unoccupied stretches of "no-man's-land" appear in between clusters of contemporaneous communities (Farmer 1957; Mackey and Green 1979; Upham and Reed 1989; Haas and Creamer 1993; Wilcox and Haas 1994). (It should be noted that the signs of cannibalism disappear from the archaeological record during this time of endemic regional warfare.) The pattern of archaeological markers indicate that violence was aimed at entire communities more than at individuals and that the conflict involved military coordination beyond the level of the residential community (Haas and Creamer 1994). The nature of the warfare was intense and brutal at this time and was an integral part of the lives of people of the northern Southwest for 50 to 100 years. At the end of the 13th century, a large portion of the region was abandoned and people were concentrated in a relatively small number of habitation zones. The signs of warfare in the archaeological record again drop precipitously during and after this time of immigration and social upheaval though they do not disappear completely. Rather, the post-1300 pattern reverts to one similar to the time before A.D. 1200 with episodic, infrequent signs of conflict cropping up here and there in the archaeological record. This pattern continues up through the early historic period just following the arrival of the first Europeans in the mid-16th century after which the local social dynamics shifted over to a new historical and evolutionary trajectory (Haas and Creamer 1997).

This abbreviated history of warfare fits a pattern of "long waves" as it enters and leaves the cultural landscape of the ancient Southwest. Similar patterns can be found in the archaeological record of many other parts of the world during the Neolithic. The dates, sequences and historical features of war are unique in each area, but the long term pattern of alternating periods of war and peace are much the same. There are also some general similarities in the nature and circumstances of conflict that cut across different world areas (see Milner 1997; Billman 1996; Dolukhanov

1996; Randsborg 1996; see also Ember and Ember 1994). Warfare often first appears in the historic sequence of a region during the initial transition from nomadic hunting and gathering to sedentary food production (or intensified food procurement). This initial conflict often involves physical violence aimed at individuals - i.e. killing people is the goal of the war rather than capturing land or resources. Such a pattern is not surprising given the lack of surplus in the economy and the mobility of the population. Removing people from an area, either by death or duress, also would have resulted in more resources for those who were left.

With the development of agriculture, a new and stable source of food became available, relieving economic stress within the system and eliminating a primary impetus for waging war. Subsequent population growth, surplus resources, sedentism and fluctuating environmental variables eventually combine to resurrect conditions conducive to warfare. In this kind of second wave, however, raiding for resources, land, and women becomes more economically attractive (see Vayda 1976; Ferguson 1984, 1990), and expectably this is the kind of warfare that prevails in the fully-developed agricultural societies of the Neolithic.

For societies engaged in full-time subsistence agriculture, warfare is an expensive proposition and not one undertaken lightly. What is it that caused people in the Neolithic to choose this expensive option and engage in warfare with other groups? The long waves of war seen in the archaeological record of the Neolithic are consistent with three different objectives: capturing resources, driving away (or killing) neighbors, and revenge. (The question of the individual motives of warriors - prestige, glory, reproductive success, etc. - is hotly debated in the ethnological literature [see Ferguson 1984; Reyna and Downs 1994; Groebel and Hinde 1989; Haas 1990] However, such motives are difficult to extract and interpret from the archaeological record and are not addressed here.) In the first two situations, the decision to wage war is essentially economic - either raiding someone else for their resources or eliminating competitors. In both cases offensive military tactics are applied as strategies to improve the immediate economic well-being of one group at the expense of another. Defensive measures in turn are taken to protect families and resources at the local level. In the Southwest example cited above, the emergence of warfare in the 12th and 13th centuries takes place within the context of high population densities, deteriorating environment, and increasing manifestations of malnutrition. The material manifestations of conflict are consistent with small war parties raiding neighbors for food resources and individual villages moving to protect communal storehouses from just those kinds of attacks (Haas and Creamer 1993).

Revenge as a motive for going to war does not offer an explanation for the origins of war in any given historical sequence, but it can help to explain the perpetuation of war. If, for example, Group A decides to raid Group B for strictly economic reasons - to steal grain to feed their starving children - and in doing so they

kill the grandmother matriarch of Group B, then Group B has a very different kind of motive for a return raid on Group A (see Chagnon 1983; cf. Ferguson 1995). Revenge is one of the primary reasons why warfare is such an expensive alternative for societies faced with economic hardship and shortages. Raiding one's neighbors to steal food by itself does not necessarily require great expenditures of energy and resources - but defending one's home from retribution can bear a very high cost. Furthermore, once the conflict starts in an area, the cyclical quest for revenge can keep it going long after the initial economic conditions have dissipated.

Going to war for both economic and revenge reasons was better suited to the conditions created by agriculture and sedentism in the Neolithic than to the more ephemeral resources and campsites of the antecedent hunting and gathering period. As might be expected, the role of warfare in Neolithic society is also more pervasive. Its impact is felt most strongly in settlement, community relations and political organization. Again the histories of individual areas are all unique, but there are nevertheless patterns in the effect that warfare has on similar kinds of agriculturally based societies.

Warfare affected Neolithic settlement in several ways. First, it contributed to the broader evolutionary trend toward increasing community aggregation. Defensive considerations bring people together for the strategic advantages of increased numbers and to realize greater efficiency in the construction of fortifications (see, for example, Burgess, et al. 1988). Rowlands (1972:458-459) also notes that "warfare may impede the fission of settlements as they reach a critical size and are no longer in balance with the economic resources available." Concerns with defense thus creates pressures for people to aggregate into larger communities and for communities to grow beyond economically optimal sizes. Second, when concerned about attacks from the outside, Neolithic farmers moved away from their fields and into site locations that were less convenient but more defensible. Such a shift would result in increased costs to the farmers getting to-and-from their fields, shortened fallow periods, and overexploitation of localized resources (such as fuelwood) around the defensive sites (Smith 1972; cf. Kohler and Van West 1996). Finally, endemic warfare led to the abandonment of stretches of militarily "dangerous" land - "no-man's-lands" - in between warring groups (Rowlands 1972; Wilcox and Haas 1994; Kowalewski, et al. 1989). While serving as neutral frontier zones, these abandoned areas resulted in potentially productive lands being taken out of production and effectively worsening regional shortages. Overall, the onset of conflict would have resulted in settlement changes that were not economically efficient and exacerbated the costs of waging war against one's neighbors in the Neolithic.

The impact of warfare on community relations in the Neolithic was a combination of push and pull. Warring communities tend to be pushed apart and defensively allied communities tend to be pulled together. Although war between groups does not necessarily stop all other forms of interaction, it does dampen the level and

nature of that interaction. To the extent opposing groups are already ethnically different from one another (in terms of language, customs, etc.) warfare may magnify and intensify the differences; whereas conflict between ethnically similar groups may lead to the coalition of new ethnic boundaries between warring parties (see Horowitz 1985).

Conversely, Neolithic warfare would have played a strong centripetal force in bringing allied communities and groups together. The threat of attack from the outside provides incentives for increased interaction, communication, and coordination between neighboring groups of communities. There are military advantages to be gained in organizing stronger war parties as well as communal defensive strategies. The organization of multiple communities for warfare purposes in turn requires some degree of coordinated or centralized decision making. Warfare stimulates the formation of political alliances between groups across wide areas and similarly may result in new forms of intergroup exchange and interaction (Ember and Ember 1971; Bernbeck 1995). On a broad evolutionary scale warfare ultimately comes to play a central role in the formation of discrete tribal polities. Tribal organization, transcending local village autonomy, emerges out of the increased levels of interaction, need for supracommunity coordination, and common interests in economic and military matters (Service 1971; Voss 1980; Haas 1990a; Haas and Creamer 1993). Warfare alone did not bring about the evolution of tribal polities, but it reinforced a broad evolutionary trajectory toward increasing social integration during the Neolithic (see Braun and Plog 1982; Gibson and Geselowitz 1988; Gregg 1991; Habicht-Mauche, et al. 1987)

Before leaving the Neolithic it should be pointed out that while warfare appears somewhere in the historical sequence of most world areas, it is not omnipresent in the archaeological record of the period. The overwhelming majority of Neolithic residential sites in the world are not defensively located, they are not surrounded by stockades, and they have not been burned or pillaged. Manifestations of warfare in rock art, burials, skeletons, and weaponry are rare rather than common. The number of well-documented cases of endemic, intense warfare at the regional level are few and far between. In contrast, extensive regional surveys and excavations have exposed long sequences in virtually every corner of the globe where material manifestations of war are absent or highly localized and episodic. War was more the exception not the rule during the Neolithic.

Warfare and the Development of Cultural Complexity

With the rise of more complex and centralized polities at the end of the Neolithic, warfare becomes a much more common and integral part of the cultural repertoire around the world. The archaeological records of chiefdoms and emergent state societies in every major world area are replete with markers of conflict, warriors, military activities, defense, and weaponry (see, for example, Adams 1966; Haas 1982; Otterbein 1985; Wilson 1988; Underhill 1989; Carneiro 1990; Hassig 1992; Redmond 1994; Anderson

1994; Billman 1996; Earle 1997; Kristiansen 1997; Connah 1987; Culbert 1991; Chang 1986; Maisels 1993; Marcus and Flannery 1996).

Although there is persistent disagreement among archaeologists over how to draw the line between states and chiefdoms, there are interesting similarities in patterns of warfare that crosscut the full spectrum of early complex polities. At the same time, there are important differences that distinguish the role of warfare in societies at different ends of that complexity spectrum.

The most striking common pattern found in the archaeological record of all kinds of centralized and hierarchical polities around the world is the universality of warfare. Material manifestations of warfare are found in settlement patterns, technological innovations, architecture, art, burials and skeletal remains. The scale and ubiquity of these manifestations is also much greater than what is seen in the Neolithic. The fortifications found in early complex societies, for example, are often dramatically greater than the relatively simple palisades and defensive features of the Neolithic farming villages (e.g., Hastorf 1993; Wheatley 1971; Webster 1976; Chang 1980; Milner 1997; Puleston and Callender 1967; Elam 1989). Also, the focus of defensive strategies often (though not always) shifts from the individual community to geographical zones or regions. Thus, rather than fortify the individual residential units in a valley, specialized fort sites are constructed to defend the valley as a whole (see, for example, Billman 1996; Hassig 1992; Adams 1977). This type of areal defensive strategy embodies both the territorial organization and the centralized decision-making structure of these early states and chiefdoms. Specialized war-related weaponry - such as swords, maces, armor, and chariots - proliferate in the archaeological record. (See Otterbein 1967 for a good ethnohistoric illustration of the development of specialized weaponry in the context of intensified warfare.)

While the history, frequency and nature of warfare in various chiefdoms and early states is specific to individual locations, it is a prominent crosscultural variable in the political relations of all these complex polities. There continues to be an ebb and flow to the conflict, but the intervals between war and peace are much shorter - short waves - than the long wave variability seen in preceding Neolithic cultural sequences. Because short wave phenomenon are much harder to distinguish in the archaeological record, most information on the frequency of conflict in complex polities comes either from early writing or from the ethnohistoric record. In Mayan hieroglyphic accounts, for example, mention of conquest events have been found with dates from one to thirty years apart over a period of about 250 years (Culbert 1988: 143-148; Culbert 1991; Hassig 1992: 219-221). Some cities are mentioned repeatedly (as being conquered or doing the conquering) and some only occasionally or never. Less decisive battles and skirmishes probably occurred with somewhat greater frequency, but are not often mentioned in the glyphs. Similarly in 3rd millennium B.C. Mesopotamia, Maisels (1990: 178-179) notes: Awar became the rule of the epics, cities were ringed with large defensive walls, their rulers thought mainly of war and conquest and thus the danger of sudden attack was an ever present reality. @

In the ethnohistoric record of a number of different chiefdoms conflict is even more frequent (Redmond 1994; Carneiro 1990; Walter 1969; Otterbein 1985; Vayda 1967; Ferguson 1984b). As Carneiro (1990:193) notes for the 16th century chiefdoms in the Cauca Valley of Columbia, Awarfare was universal, acute, and unending. @

The chronic nature of warfare in chiefdoms and early states meant that military affairs and concerns permeated much more deeply and pervasively into the lives of people and the organization of society. Warfare was intimately interwoven with the economy and ideology of these societies (Haas 1982; Earle 1991, 1997). The development of specialized military personnel - warriors, soldiers, officers, was one index of the relationship between warfare and the economy. The number and organization of these individuals varies substantially in different cultures, ranging from a relatively small retinue of individuals surrounding a chief to a large, standing, professional army. Whatever the size of the specialized military force, they were necessarily supported by surplus extracted from the economy (see, for example, Earle 1977).

In turn, the military enhanced the economy by providing protection for producers and trade networks, and by capturing new territory, workers, and foreign resources (Gelb 1973; Webb 1975; Webster 1975; Sasson 1969; Kristiansen 1991; Postgate 1992; Hassig 1992; Yoffee 1995; Billman 1996) The interaction between ideology and warfare is yet another indication of the depth of integration of war into all parts of the social systems of ancient complex polities. It is manifested archaeologically primarily in the iconographic depiction and glorification of warriors and war in a variety of artistic media. As writing systems develop in different world areas they also quickly come to recount tales of battles, victories, and the deeds of great soldiers (Fash 1991; Marcus 1992; Postgate 1992; Chang 1980). As ideology provide legitimation for the actions of the military, the military served as a means to reinforce the glory and word of a society=s gods and to spread the influence of those gods to a wider pool of believers (Sharer and Grove 1989; Demarest and Conrad 1992; Joyce and Winter 1996).

Beyond spreading the word of religion, the expansionist role of the military served to extend the territorial limits of chiefdoms and states through conquest and incorporation (Carneiro 1970; 1978; 1981; 1990; 1994; Wilson 1988; Roscoe and Graber 1988). The examples of conquest in the archaeological record of ancient complex polities in every subregion of the world are far too common to enumerate (see, for example, Zeitlin 1990; Yoffee 1995).

There are relatively small scale incidents of conquest that may be mentioned in early texts, but are otherwise indistinguishable in the archaeological record. Thus in the Mayan area again, for example, hieroglyphic texts there are fairly frequent claims of conquest of one city by another (Culbert 1991), but little if any sign of such conquest in the material remains of either city. In contrast, when all of southern and central Mesopotamia was consolidated through conquest by the Akkadian ruler, Sargon, in the 3rd millennium B.C., the entire cultural landscape was altered in terms of settlement, architecture, ceramics, resource

distribution, and political hierarchy (Liverani 1993; cf. Hassig 1988 and Bauer 1992 for similar accounts of conquest/expansionism by Aztecs and Incas, respectively). Although clearly rulers used warfare and military might as tools to expand their territory, it is generally not cost effective for rulers to depend on the physical might of the armed forces to govern a population on a continuing, regular basis (Haas 1982; DeMarrais, et al. 1996). Expansionist states formed by conquest and ruled by brute force, such as that forged by Sargon, were subject to rebellion and fragmentation (see Yoffee 1995). An alternative strategy, applied in the Inca and Aztec cases, was to attempt to legitimize the governing authority of the victorious party through a combination of ideological and economic measures (Hassig 1988; Bauer 1992; Morris and Thompson 1985).

Together, the military organization, economy and ideology in chiefdoms and early states provided the chiefs and rulers in these societies with a complementary triad of power bases for exercising control over their respective populations (Haas 1982; Mann 1986; Earle 1997). While all three tend to play a role in the power structure of ancient complex polities, their relative importance varies tremendously depending on historical contingencies. Thus, there are times when rulers rely more heavily on the military in the exercise of their power and at other times depend on their control over economic resources or access to the gods. As the frequency and intensity of warfare fluctuate in any given system, the role and importance of the military in the governmental power structure also fluctuate.

With the maturation of emergent complex polities into fully developed states, warfare continues to play an imposing role in every major world area. Warfare plays a particularly central role in the formation of empires as the armed forces of one society expands its rule and boundaries through the physical conquest of adjoining and distant territories (Sinopoli 1994; Schreiber 1987, 1992; Conrad and Demarest 1984; Murra 1986; Allsen 1987; Hassig 1988; Gabba 1976; Engels 1978). Civil war, in turn, leads to the demise of those same empires. Ultimately, the historical trajectory of every state is affected by the ebb and flow of conflict over time. Alliances are formed and dissolved, boundaries expand and contract. Warfare serves both a means of exercising power within society and a means of extending the rule of a state to neighboring polities.

The bloody smear of warfare has blotted the face of humanity now for thousands of years. Its oppressive presence has contaminated all the cultures of the contemporary ethnographic world in exposing them to the terror and grief of armed violence between opposing social groups. In trying to understand the role of warfare in the evolution of cultural systems, the window of archaeology provides a number of valuable insights.

1. There is simply no evidence to support the notion that warfare is an omnipresent and natural component of human existence. In looking at the vast archaeological record of humanity on the planet, there are millennial periods during which there are simply

no material manifestations of social conflict over huge tracts of territory. Although the absence of evidence does not preclude the possibility of warfare, it is significant to point out that for any given cultural region, clear evidence of warfare appears at a recognizable historical moment in the archaeological record. The juxtaposition of the presence and absence of markers of warfare helps to further affirm that intergroup conflict itself is present at some times and absent at others in the history of a given culture.

2. The archaeological record demonstrates that warfare is not just an ugly stepchild of complex, centralized societies. At least intermittent warfare appears long before the emergence of the first chiefdoms and states. The signs of warfare in Neolithic tribal societies, without any influence of state expansion and colonialism, are unequivocal. It is perhaps important, however, to emphasize the qualifier intermittent. The frequency of warfare in prestate tribal societies in the archaeological past appears to be significantly lower than the incidence of warfare in ethnographically-known tribal societies in the present world of pervasive European colonialism.

3. Warfare grows out of a combination of economic and demographic variables. It emerges in the ancient past in association with some degree of territoriality and sedentism and with concentrations of resources. The development of agriculture is not a necessary precondition for the onset of war, but it provides an accommodating environment within which warfare can arise and spread. Population growth, sedentary village life, surplus production, fluctuating environment, and intergroup competition combine in various formulas to foster the outbreak of violence in different world areas.

4. The level, intensity, and impact of warfare tend to increase as cultural systems become more complex. In the early record of simpler societies, warfare is highly episodic and has relatively slight impact on social organization, settlement, demography or technology. As social systems become more complex, signs of warfare appear more frequently in the archaeological record and it has a greater impact on social systems. People aggregate into defensive communities, coordinate strategies between communities, and develop specialized social and technological devices for waging war. At least in some areas, warfare played a central causal role in the eventual evolution of even more complex chiefdom and state societies.

5. Warfare is an integral part of the power structure, organization, and operation of all early chiefdom and state societies recognizable in the archaeological record. Chiefs and state rulers used warfare and the associated military apparatus to exercise power at home and to expand/defend their boundaries against outside enemies - real or perceived. The higher frequency of warfare in states and chiefdoms is not necessarily a product of organizational complexity; rather, the economic and demographic conditions that are conducive to warfare and also conducive to the development of complex, centralized polities.

6. Ultimately, relief from warfare is to be found in relieving the material conditions that foment warfare. The archaeological record demonstrates fairly clearly that warfare both comes and goes in waves. While combinations of economic, demographic and environmental pressures may lead to war, the abatement of those pressures also serves to effectively dampen the perpetuation of conflict. The ideology and prestige systems that often develop to maintain and support a military apparatus in a society, do not ultimately outweigh the oppressive costs of waging war without external incentives. Warfare is not inevitable.

- Adams, Robert McC.
1966 The Evolution of Urban Society. Aldine, Chicago.
- Adams, William Y.
1977 Nubia: Corridor to Africa. Allen Lane, London.
- Allsen, T. T.
1987 Mongol Imperialism. University of California Press, Berkeley.
- Anderson, David G.
1994 The Savannah River Chiefdoms: Political Change in the Late Prehistoric Southeast. University of Alabama Press, Tuscaloosa.
- Anderson, J.E.
1968 "Late Paleolithic Skeletal Remains from Nubia." In The Prehistory of Nubia, Assembled and edited by Fred Wendorf, pp. 996-1040. Southern Methodist University Press, Dallas.
- Ardrey, Robert
1966 The Territorial Imperative. Atheneum, NY.
- Baines, John and Jaromir Malek
1996 Atlas of Ancient Egypt. Facts on File, NY.
- Bauer, Brian S.
1992 The Development of the Inca State. University of Texas Press, Austin.
- Bernbeck, Reinhard
1995 A Lasting Alliances and Emerging Competition: Economic Developments in Early Mesopotamia. @ Journal of Anthropological Archaeology 14(1):1-25.
- Bettinger, Robert L.
1991 Hunter-Gatherers: Archaeological and Evolutionary Theory. Plenum, NY.
- Billman, Brian
1996 The Evolution of Prehistoric Political Organization in the Moche Valley, Peru. Unpublished Ph.D. dissertation, Department of Anthropology, University of California, Santa Barbara.
- Billman, Brian R., Patricia M. Lambert and Banks L. Leonard
n.d. "Cannibalism, Warfare, and Drought in the Mesa Verde Region during the Twelfth Century A.D." Manuscript forthcoming in American Antiquity.

- Binford, Lewis R.
1972 An Archaeological Perspective. Seminar Press, NY.
- Braun, David P. and Stephen Plog
1982 "Evolution of 'Tribal' Social Networks: Theory and Prehistoric North American Evidence." American Antiquity 47:504-25.
- Bremer, Stuart a. and Thomas R. Cusack, eds.
1995 The Process of War: Advancing the Scientific Study of War. Gordon and Breach, Amsterdam.
- Burgess, C., P. Topping, C. Mordant, and M. Maddison, eds.
1988 Enclosures and Defenses in the Neolithic of Western Europe. British Archaeological Reports, I.S. No. 403(i), Oxford.
- Carneiro, Robert
1970 AA Theory of the Origin of the State.@ Science 169:733-738.
- 1978 APolitical Expansion as an Expression of the Principle of Competitive Exclusion.@ In Origins of the State, edited by Ronald Cohen and Elman Service, pp. 205-223. Institute for the Study of Human Issues, Philadelphia.
- 1981 AThe Chiefdom: Precursor of the State.@ In The Transition to Statehood in the New World, edited by Grant Jones and Robert Kautz, pp. 37-79. Cambridge University Press, NY.
- 1990 "Chiefdom-level Warfare as Exemplified in Fiji and the Cauca Valley." In The Anthropology of War, edited by Jonathan Haas, pp. 190-211. Cambridge University Press, New York.
- 1994 AWar and Peace: Alternating Realities in Human History.@ In Studying War: Anthropological Perspective, edited by S.P. Reyna and R.E. Downs, pp. 3-28. Gordon and Breach, Amsterdam.
- Chagnon, Napoleon
1983 Yanomamo: The Fierce People, 3rd Edition. Holt, Rinehart and Winston, NY.
- 1990 AReproductive and Somatic Conflicts of Interest in the Genesis of Violence and Warfare among Tribesmen.@ In The Anthropology of War, edited by Jonathan Haas, pp. 77-104. Cambridge University Press, NY.
- Chang, Kwang-chih
1980 Shang Civilization. Yale University Press, New Haven.

- 1986 The Archaeology of Ancient China, Fourth Edition. Yale University Press, New Haven.
- Clark, J. Desmond
1971 AA re-examination of the evidence for agricultural origins in the Nile Valley.@ Proceedings of the Prehistoric Society, Vol. XXXVIII, Part II: 34-79.
- Connah, Graham
1991 Africal Civilizations: Precolonial Cities and States in Tropical Africa, an Archaeological Perspective. Cambridge University Press, Cambridge.
- Conrad, Geoffrey W. and Arthur Demarest
1984 Religion and Empire: the Dynamics of Aztec and Inca Expansionism. Cambridge University Press, Cambridge.
- Cordell, Linda
1997 Archaeology of the Southwest. Second Edition. New York, Academic Press.
- Culbert, T. Patrick
1988 APolitical History and the Decipherment of Maya Glyphs.@ Antiquity 62:135-152.
- Culbert, T. Patrick, ed.
1991 Classic Maya Political History. Cambridge University Press, NY.
- Dean, Jeffrey, S., A.J. Lindsay, Jr., and W. Robinson
1987 APrehistoric Settlement in Long House Valley, Northeastern Arizona.@ In Investigations of the Southwestern Anthropological Research Group: An Experiment in Archeological Coopertion. The Proceedings of the 1976 Conference, edited by Robert C. Euler and George Gumerman, pp. 25-44. Museum of Northern Arizona, Flagstaff.
- Dean, Jeffrey, S., Robert C. Euler, George J. Gumerman, Fred Plog, Richard H. Hevly, and Thor N.V. Karlstrom
1985 "Human Behavior, Demography, and Paleoenvironment on the Colorado Plateaus." American Antiquity 50(3):537-554.
- Demarest, Arthur A. and Geoffrey W. Conrad, eds.
1992 Ideology and Pre-Columbian Civilizations. School of American Research Press, Santa Fe, NM.
- DeMarrais, Elizabeth, Luis Jaime Castillo, and Timothy Earle
1996 AIdeology, Materialization, and Power Strategies.@ Current

Anthropology 37(1):15-31.

Dolukhanov, Pavel

1996 "War and Peace in late prehistoric Europe - Social Networks and Power on the East European Plain in the Late Neolithic - Early Bronze Age." Paper presented at the conference on Ancient Warfare: Archaeological Perspectives, Durham, England, 1996.

Earle, Timothy

1977 AA Reappraisal of Redistribution: Complex Hawaiian Chiefdoms.@ In Exchange Systems in Prehistory, edited by Timothy K. Earle and Jonathan Ericson, pp. 213-232. Academic Press, NY.

1997 How Chiefs Come to Power. Stanford University Press, Stanford.

Earle, Timothy, ed.

1991 Chiefdoms: Power, Economy and Ideology. Cambridge University Press, NY.

Eibl-Eibesfeldt, Irenaus

1979 The Biology of War. The Viking Press, New York.

Elam, J. Michael

1989 ADefensible and Fortified Sites.@ In Monte Alban=s Hinterland, Part II: The Prehispanic Settlement Patterns in Tlacolula, Etna and Ocotlan, the Valley of Oaxaca, Mexico, edited by Stephen A. Kowalewski, Gary M. Feinman, L. Finsten, Richard E. Blanton and Linda M. Nicholas, pp. 385-407. Memoir 23, Museum of Anthropology, University of Michigan, Ann Arbor.

Ember, Caroline R. and Melvin Ember

1992 "Resource Unpredictability, Mistrust, and War: A Cross-Cultural Study." Journal of Conflict Resolution 36:242-262.

Ember, Melvin and Carol R. Ember

1971 AThe Conditions Favoring Matrilocal Versus Patrilocal Residence.@ American Anthropologist 73:571-694.

1994 "Cross-Cultural Studies of War and Peace: Recent Achievements and Future Possibilities." In Studying War: Anthropological Perspectives, edited by S.P. Reyna and R.E. Downs, pp. 185-208. Gordon and Breach, Amsterdam.

Engel, Frederic

1963 A Preceramic Settlement on the Central Coast of Peru: Asic, Unit 1. Transactions of the American Philosophical Society,

New Series 53:3. Philadelphia.

Engels, Donald. w.

1978 Alexander the Great and the Logistics of the Macedonian Army.
University of California Press, Berkeley.

Farmer, Malcolm F.

1957 "A Suggested Typology of Defensive Systems of the Southwest."
Southwestern Journal of Anthropology 13:249-266.

Fash, William L.

1991 Scribes, Warriors, and Kings: The City of Copan and the
Ancient Maya. Thames and Hudson, London.

Ferguson, R. Brian

1984 "Introduction: Studying War." In Warfare, Culture and
Environment, edited by R. Brian Ferguson, pp. 1-81. Academic
Press, Orlando.

1984a Warfare, Culture and Environment, ed. Academic Press,
Orlando.

1984b AA Reexamination of the Causes of Northwest Coast Warfare.
In Warfare, Culture and Environment, edited by R. Brian
Ferguson, pp. 267-328. Academic Press, Orlando.

1990 "Explaining War." In The Anthropology of War, edited by
Jonathan Haas, pp. 26-55. Cambridge University Press, New
York.

1995 Yanomami Warfare: A Political History. School of American
Research Press, Santa Fe.

1997 Review of War Before Civilization by Lawrence Keeley.
American Anthropologist 99(2):424-425.

Ferguson, R. Brian and Neil Whitehead, eds.

1994 War in the Tribal Zone: Expanding States and Indigenous
Warfare. School of American Research Press, Santa Fe, NM.

Ferrill, Arther

1985 The Origins of War: From the Stone Age to Alexander the
Great. Thames and Hudson, London

Fried, Morton H.

1967 The Evolution of Political Society: An Essay in Political
Anthropology. Random House, NY.

Gabba, E.

1976 Republican Rome, the Army and the Allies. Blackwell, NY.

- Gelb, I.J.
 1973 APrisoners of War in Early Mesopotamia.@ Journal of Near Eastern Studies 32:70-98.
- Gibson, D. Blair and Michael N. Geselowitz, eds.
 1988 Tribe and Polity in Late Prehistoric Europe: Demography, Production, and Exchange in the Evolution of Complex Social Systems. Plenum, NY.
- Gregg, Susan A., ed.
 1991 Between Bands and States. Center for Archaeological Investigations, Southern Illinois University, Carbondale.
- Groebel, Jo and Robert A. Hinde
 1989 Aggression and War: Their Biological and Social Bases. Cambridge University Press, New York.
- Gumerman, George J., ed.
 1988 The Anasazi in a Changing Environment. Cambridge University Press, NY.
- Haas, Jonathan
 1982 The Evolution of the Prehistoric State. Columbia University Press, NY.
- 1989 AThe Evolution of the Kayenta Regional System.@ In The Sociopolitical Structure of Prehistoric Southwestern Societies, edited by Steadman Upham, Kent Lightfoot and Roberta Jewett, pp. 491-508. Westview Press, Boulder, CO.
- 1990a "Warfare and the Evolution of Tribal Polities in the Prehistoric Southwest." In The Anthropology of War, edited by Jonathan Haas, pp. 171-189. Cambridge University Press, New York.
- Haas, Jonathan, ed.
 1990b The Anthropology of War. Cambridge University Press, New York.
- Haas, Jonathan and Winifred M. Creamer
 1993 Stress and Warfare among the Kayenta Anasazi of the 13th Century A.D. Fieldiana: Anthropology, n.s. 88.
- 1996 "The Role of Warfare in the Pueblo III Period." In The Pueblo III Period in the Northern Southwest, edited by Mike Adler. University of Arizona Press, Tucson.
- 1997 AWarfare Among the Pueblos: Myth, History and Ethnography.@ Ethnohistory 44:2235-261.

- Habicht-Mauche, Judith A., John Hoopes and Michael Geselowitz
 1987 AWhere=s the Chief?: The Archaeology of Complex Tribes.@
 Paper presented at the 52nd Annual Meeting of the Society for
 American Archaeology, Toronto.
- Haddington, Evan
 1979 Secrets of the Ice Age: The World of the Cave Artists.
 London.
- Hall, Edward Twitchell, Jr.
 1944 Early Stockaded Settlements in the Gobernador, New Mexico.
 Columbia Studies in Archeology, Columbia University, NY.
- Hassig, Ross
 1988 Aztec Warfare: Imperial Expansion and Political Control.
 University of Oklahoma Press, Norman.
 1992 War and Society in Ancient Mesoamerica. University of
 California Press, Berkeley.
- Hastorf, Christine
 1993 Agriculture and the Onset of Political Inequality Before the
Inca. Cambridge University Press, Cambridge.
- Henderson, Diedtra
 1998 Seattle Times (March 27) "Ancient bones seem to say Kennewick
 Man was homicide victim."
- Hobbes, Thomas
 1968 Leviathan. Penguin Books, Maryland.
- Horowitz, Donald L.
 1985 Ethnic Groups in Conflict. University of California Press,
 Berkeley.
- Irwin-Williams, Cynthia
 1973 The Oshara Tradition: Origins if the Anasazi Culture.
 Eastern New Mexico University, Portales.
- Joyce, Arthur A. and Marcus Winter
 1996 AIdeology, Power, and Urban Society in Pre-Hispanic Oaxaca.@
Current Anthropology 37(1):33-47.
- Keeley, Lawrence H.
 1996 War Before Civilization: The Myth of the Peaceful Savage.
 Oxford University Press, NY.
- Keeley, Lawrence H. and D. Cahen
 1989 AEarly Neolithic Forts and Villages in Northeastern Belgium:
 A Preliminary Report.@ Journal of Field Archaeology 16:157-
 176.

- Kohler, Timothy A. and Carla R. Van West
 1996 "The Calculus of Self Interest in the Development of Cooperation: Sociological Development and Risk Among the Northern Anasazi." In Evolving Complexity and Environment: Risk in the Prehistoric Southwest, edited by J.A. Tainter and B.B. Tainter, pp. 171-198. Addison-Wesley, Reading, MA.
- Kowalewski, Stephen A., Gary M. Feinman, L. Finsten, Richard E. Blanton and Linda M. Nicholas
 1989 Monte Alban=s Hinterland, Part II: The Prehispanic Settlement Patterns in Tlacolula, ETLA and Ocotlan, the Valley of Oaxaca, Mexico. Memoir 23, Museum of Anthropology, University of Michigan, Ann Arbor.
- Kristiansen, Kristian
 1991 Chiefdoms, States, and Systems of Social Evolution. In Chiefdoms: Power, Economy and Ideology, edited by Timothy Earle, pp. 16-43. Cambridge University Press, NY.
- 1997 "The Emergence of Warrior Aristocracies in later European Prehistory and Their Long Term History." Paper presented at conference on "Leaders to Rulers: The Development of Political Centralization." The Field Museum, Chicago.
- Lambert, Patricia and Phillip L. Walker
 1989 Skeletal Evidence for Stress During a Period of Cultural Change in Prehistoric California. In Advances in Paleopathology, Journal of Paleopathology: Monographic Publication No. 1, edited by Luigi Capasso, pp. 207-212. Marino Solfanelli, Chieti, Italy.
- Liverani, M.
 1993 Akkad: The first World Empire. Sargon, Padua.
- Lorenz, Konrad
 1966 On Aggression. Harcourt, Brace and World, NY.
- Mackey and Green
 1979 Alargo Gallina Towers: An Explanation. @ American Antiquity 44:145-154.
- Maisels, Charles Keith
 1993 The Emergence of Civilization: From Hunting and Gathering to Agriculture, Cities and the State in the Near East. Routledge, London.
- Mann, Michael
 1986 The Sources of Social Power. Cambridge University Press, Cambridge.

- Marcus, Joyce
 1992 Mesoamerican Writing systems: Propoganda, Myth, and History in Four Ancient Civilizations. Princeton University Press, Princeton.
- Marcus, Joyce and Kent V. Flannery
 1996 Zapotec Civilization: How Urban Society Evolved in Mexico=s Oaxaca Valley. Thames and Hudson, London.
- Marshall, Michael
 1987 Long Waves of Regional Development. St. Martin=s Press, NY.
- Matson, R.G.
 1991 The Origins of Southwestern Agriculture. University of Arizona Press, Tucson.
- 1994 AAnomalous Basketmaker II Sites On Cedar Mesa: Not So Anomalous After All.@ Kiva 60:2.
- Matson, R.G. and Sally J. Cole
 1994 AEthnicity and Conflict among the Basketmaker II of the U.S. Southwest.@ In The Archeology of Contact; Processes and Consequence, edited by B. Kulle. The Archeological Association of the University of Calgary, Calgary.
- Matson, R.G. and William D. Lipe
 1978 ASettlement Patterns on Cedar Mesa: Boom and Bust on the Northern Periphery.@ In Investigations by the Southwestern Anthropological Research Group: An Exercise in Archeological Cooperation, edited by R.C. Euler and G. Gumerman, pp. 1-12. Museum of Northern Arizona Bulletin no.50. Museum of Northern Arizona, Flagstaff.
- McCauley, Clark
 1990 AConference Overview.@ In The Anthropology of War, edited by Jonathan Haas, pp. 1-25. Cambridge University Press, Cambridge.
- Milner, George R.
 1995 AAn Osteological Perspective on Prehistoric Warfare.@ In Regional Approaches to Mortuary Analysis, edited by Lois A. Beck, pp. 221-244. Plenum, NY.
- 1997 APrehistoric Warfare in Eastern North America.@ Journal of Archaeological Research 5:
- Montagu, Ashley
 1976 The Nature of Human Aggression. New York.

- Montagu, Ashley, ed.
1968 Man and Aggression. New York.
- 1978 Learning Non-Aggression: The Experience of the Non-Literate Societies. Oxford University Press, New York.
- Moore, Andrew M.T.
1985 "The Development of Neolithic Societies in the Near East."
In Advances in World Archaeology, Vol. 4. Edited by Fred Wendorf and Angela Close, pp. 1-70. Academic Press, Orlando.
- Morris, Craig and Donald E. Thompson
1985 Huanuco Pampa: an Inca City and Its Hinterland. Thames and Hudson, London.
- Murra John V.
1986 AThe Expansion of the Inka State: Armies, War, and Rebellions.@ In Anthropological History of Andean Politics, John v. Murra, N. Wachtel, and J. Revel, eds., pp. 49-58. Cambridge University Press, Cambridge.
- Otterbein, Keith F.
1967 AThe Evolution of Zulu Warfare.@ In Law and Warfare: Studies in the Anthropology of Conflict, edited by Paul Bohannon, pp. 351-357. Natural History Press, Garden City, NY.
- 1985 The Evolution of War: A Cross-Cultural Study. HRAF Press, New Haven, CT.
- Peregrine, Peter
1992 Mississippian Evolution: A World-System Perspective. Monographs in world Archaeology 9, Prehistory Press, Madison, WI.
- 1993 AAn Archaeological Correlate of War.@ North American Archaeologist, 14(2):139-151.
- Plog, Fred
1984 AExchange, Tribes and Alliances: The Northern Southwest.@ American Archaeology 4(3):217-223.
- Plog, Stephen, ed.
1986 Spatial Organization and Exchange: Archeological Survey on Northern Black Mesa. Southern Illinois University Press, Carbondale.
- 1997 Ancient Peoples of the American Southwest. Thames and Hudson, London.

- Postgate, J.N.
1992 Early Mesopotamia: Society and Economy at the Dawn of History. Routledge, London.
- Powell, S.
1983 Mobility and Adaptation: Tyhe Anasazi of Black Mesa, Arizona. Southern Illinois University Press, Carbondale,
- Price, T. Douglas and James Brown, eds.
1985 Prehistoric Hunter-Gatherers: The Emergence of Cultural Complexity. Academic Press, Orlando.
- Puleston, Dennis E. and E.W. Callender, Jr.
1967 ADefensive Earthworks at Tikal.@ Expedition 9(2):40-8.
- Randsborg, Klavs
1996 "Hjortspring: Warfare in Early Europe.@ Paper presented at the conference on Ancient Warfare: Archaeological Perspectives, Durham, England, 1996.
- Redmond, Elsa M.
1994 Tribal and Chiefly Warfare in South America. Memoirs of the Museum of Anthropology, University of Michigan, No. 28, Ann Arbor.
- Renouf, M.A.P.
1991 "Sedentary Hunter-Gatherers: A Case for Northern Coasts." In Between Bands and States, edited by Susan A. Gregg, pp. 89-107. Center for Archaeological Investigations, Southern Illinois University at Carbondale, Occasional Paper No. 9.
- Reyna, Stephen P. and R.E. Downs, eds.
1994 Studying War: Anthropological Perspectives, Gordon and Breach, Amsterdam.
- Rohn, A.
1975 AA Stockaded Basketmaker III Village at Yellow Jacket, Colorado.@ Kiva 40: 113-19.
- Roper, M.
1969 AA Survey of the Evidence for Intrahuman Killing in the Pleistocene.@ Current Anthropology 10:427-59.
- Roscoe, Paul B. and Robert B. Graber, eds.
1988 Circumscription and the Evolution of Society, special issue of American Behavioral Scientist 31(4):403-511.
- Rousseau, Jean-Jacques

- 1964 The Social Contract and Discourse on the Origin and Foundation of Inequality Among Mankind (1762 and 1755, respectively), edited by Leslie G. Crocker. Washington Square Press, New York.
- Rowlands Michael J.
 1972 "Defense: A Factor in the Organization of Settlements." In Man, Settlement and Urbanism, edited by Peter J. Ucko, Ruth Tringham, and G. W. Dimbleby, pp. 447-462. Duckworth, London.
- Ryan, Dennis J.
 1977 The Paleopathology and Paleoepidemiology of the Kayenta Anasazi Indians in Northeastern Arizona. Unpublished Ph.D. dissertation, Department of Anthropology, Arizona State University, Tempe.
- Sasson, J.M.
 1969 The Military Establishments at Mari. Studia Pohl 3, Rome.
- Schreiber, Katharina M.
 1987 AConquest and Consolidation: A Comparison of the Wari and Inca Occupations of a Highland Peruvian Valley.@ American Antiquity 52:266-284.
- 1992 Wari Imperialism in Middle Horizon Peru. Anthropological Papers of the Museum of Anthropology, No. 87. University of Michigan, Ann Arbor.
- Service, Elman R.
 1971 Primitive Social Organization: An Evolutionary Perspective, Second Edition. Random House, NY.
- Sharer, Robert J. and David C. Grove, eds.
 1989 Regional Perspectives on the Olmec. Cambridge University Press, NY.
- Sinopoli, Carla
 1994 AThe Archaeology of Empires.@ Annual Review of Anthropology 23:159-180.
- Smith, Bruce D.
 1986 "The Archaeology of the Southeastern United States: From Dalton to de Soto." In Advances in World Archaeology, Vol 5, edited by Fred Wendorf and Angela Close, pp. 1-92. Academic Press, Orlando.
- 1989 "Origins of Agriculture in Eastern North America." Science 246:1566-1571.
- Smith, Maria O.

1995 AScalping n the Archaic Period: Evidence from the Western Tennessee Valley.@ Southeastern Archaeology 14:60-68.

Smith, Philip E.L.

1972 "Land-use, Settlement Paterns and Subsistence Agriculture: A Demographic Perspective." In Man, Settlement and Urbanism, edited by Peter J. Ucko, Ruth Tringham, and G. W. Dimbleby, pp. 409-425. Duckworth, London.

Straus, Lawrence Guy, Berit Valentin Eriksen, Jon M. Erlandson, and David R. Yesner, eds.

1996 Humans at the End of the Ice Age: The Archaeology of the Pleistocene-Holocene Transition. Plenum, NY.

Streuver, Stuart and F.A. Holton

1979 Koster: Americans in Search of the Prehistoric Past. Anchor Press, NY.

Tacon, Paul and Christopher Chippendale

1994 AAustralia=s Ancient Warriors: Changing Depictions of Fighting in the Rock Art of Arnhem Land, N.T.@ Cambridge Archaeological Journal 42(2):211-248.

Topic, John R.

1989 "The Ostra Site: The Earliest Fortified Site in the New World?" In Cultures in Conflict: Current Archaeological Perspectives, Edited by Diana C. Tkaczuk and Brian C. Vivian, pp. 215-228. Proceedings of the Twentieth Annual Chacmool Conference, The Archaeological Association of the University of Calgary, Calgary.

Turner, Christy G.

1989 "Teec Nos Pos: More Possible Cannibalism in Northeastern Arizona." Kiva 54:147-152.

1993 "Cannibalism in Chaco Canyon: The Charnel Pit excavated in 1926 at Small House Ruin by Frank H.H. Roberts, Jr. American.@ Journal of Physical Anthropology 91:421-439

Turner, Christy G. and J. A. Turner

1992 "The First Claim for Cannibalism in the Southwest: Walter Hough's 1901 Discovery at Canyon Butte Ruin 3, Northeastern Arizona." American Antiquity 57:661-682.

1995 "Cannibalism in the Prehistoric American Southwest: Incidence, Taphonomy, Explanation, and Suggestions for Standardized World Definitions"Anthropological Science 103(1):1-22.

Underhill, Anne P.

- 1989 "Warfare During the Chinese Neolithic Period: A Review of the Evidence." In Cultures in Conflict: Current Archaeological Perspectives, Edited by Diana C. Tkaczuk and Brian C. Vivian, pp. 229-240. Proceedings of the Twentieth Annual Chacmool Conference, The Archaeological Association of the University of Calgary, Calgary.
- Upham, Steadman and Paul Reed
 1989 "Inferring the Structure of Anasazi Warfare", In Cultures in Conflict: Current Archaeological Perspectives, Edited by Diana C. Tkaczuk and Brian C. Vivian, pp. 153-162. Proceedings of the Twentieth Annual Chacmool Conference, The Archaeological Association of the University of Calgary, Calgary.
- Van West, Carla R.
 1994 Modeling Prehistoric Agricultural Productivity in Southwestern Colorado: A GIS Approach. Washington State University Department of Anthropology Reports of Investigations 67. Pullman, WA.
- Vayda, Andrew
 1967 AMAori Warfare.@ In Law and Warfare: Studies in the Anthropology of Conflict, edited by Paul Bohannon, pp. 359-380. Natural History Press, Garden City, NY.
- 1976 War in Ecological Perspective: Persistence, Change and Adaptive Processes in Three Oceanian Societies. Plenum, NY.
- Vencl, S.
 1984 AWar and Warfare in Archeology.@ Journal of Anthropological Archeology.
- 1991 AInterpretation des Blessures Causee par les Armes au Mesolithique.@ L=Anthropologie.
- Voss, Jerome A.
 1980 Tribal Emergence During the Neolithic of Northwestern Europe. Unpublished PhD Dissertation, Department of Anthropology, University of Michigan, Ann Arbor.
- Walker, Phillip L.
 1989 ACranial Injuries As Evidence of Violence In Prehistoric Southern California.@ American Journal of Physical Anthropology. 80:313-323.
- Walter, Eugene V.
 1969 Terror and Resistance: A Study of Political Violence. Oxford University Press, London.

- Watkins, Trevor
 1989 The Beginnings of Warfare.@ In Warfare in the Ancient World, edited by John Hackett, pp. 15-35. Facts on File, New York.
- Webb, Malcom
 1975 The Flag Follows Trade: An Essay on the Necessary Interaction of Military and Commercial Factors in State Formation. In Ancient Civilizations and Trade. J. Sabloff C. Lamberg-Karlovsky, eds. Albuquerque: School of American Research, University of New Mexico.
- Webster, David L.
 1975 Warfare and the Evolution of the State: A Reconsideration.@ American Antiquity. 40:464-70.
- 1976 Defensive Earthworks at Becan, Campeche, Mexico: Implications for Maya Warfare. Middle American Research Institute Publication 41, Tulane University, New Orleans.
- 1977 Warfare and the Evolution of Maya Civilization.@ In The Origins of Maya Civilization, edited by Richard E.W. Adams, pp. 335-372. University of New Mexico Press, Albuquerque.
- Wendorf, Fred
 1968 "Site 117: A Nubian Final Paleolithic Graveyard near Jebel Sahaba, Sudan." In The Prehistory of Nubia, Assembled and edited by Fred Wendorf, pp. 954-995. Southern Methodist University Press, Dallas.
- Wendorf, Fred and R. Schild
 1986 The Wadi Kubbaniya Skeleton: A Late Paleolithic Burial from Southern Egypt. Dallas: Southern Methodist University Press.
- Wheatley, Paul
 1971 The Pivot of the Four Quarters. Aldine, Chicago.
- White, T.D.
 1992 Prehistoric Cannibalism at Mancos 5MTUMR-2346. Princeton University Press, Princeton.
- Wilcox, David R and Jonathan Haas
 1994 The Scream of the Butterfly: Competition and Conflict in the Prehistoric Southwest.@ In Themes in Southwestern Prehistory, edited by George J. Gumerman, pp. 211-238. School of American Research Press, Santa Fe, NM.
- Willey, P.
 1990 Prehistoric Warfare on the Great Plains. Garland, New York.

Wills, W.H.
1988 Early Prehistoric Agriculture. School of American Research
Press, New Mexico.

Wilson, David J.
1988 Prehispanic Settlement Patterns in the Lower Santa Valley,
Peru. Smithsonian Institution Press, Washington, D.C.

Wright, Quincy
1965 A Study of War. University of Chicago Press, Chicago.

Yoffee, Norman
1995 A Political Economy in Early Mesopotamian States.@ Annual
Review of Anthropology 24:281-311.

Zeitlin, Robert N.
1990 A The Isthmus and the Valley of Oaxaca: Questions about
Zapotec Imperialism in Formative Period Mesoamerica.@
American Antiquity 55(2):250-261.

