Pinker's List: Exaggerating Prehistoric War Mortality

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Exaggerating Prehistoric War Mortality

R. Brian Ferguson

War, in one form or another, appeared with the first man.
Barack Obama, *Nobel Peace Prize Acceptance Speech*

This chapter is one of a pair (see also Ferguson, chapter 11) that challenge the idea that deadly intergroup violence has been common enough in our species, evolutionary history to act as a selection force shaping human psychological tendencies, toward either external violence or internal cooperation. Broken down, there are three related propositions: (a) war was ubiquitous throughout our species, evolutionary history; (b) war is a natural expression of evolved tendencies toward deadly violence against individuals outside the social group; (c) war casualties were sufficiently high to select for behavioral tendencies conferring reproductive advantage in intergroup competition. For either (b) or (c) to be true, (a) must be true. This chapter and chapter 11 argue that archaeological evidence shows (a) to be false.

Archaeology and Evolutionary Theories

The archaeological record has little to say about questions of intra-species violence over most of human evolution. The evidentiary record prior to the development of states is our best window into early human behavior. If war is our species' natural way, if we are innately inclined to war, it should show up there, in prehistory. For many, many scholars in evolutionary psychology and kindred approaches, it has become accepted as "fact" that war was the rule among prehistoric peoples, and regularly accounted for a very high percentage of all, and especially male, deaths (Fry, chapter 1).

The lineage of theories attributing war to innate predispositions to kill those outside the in-group is deep and broad (Ferguson, 1984a, pp. 8–12; 2001, pp. 106–111; 2011; Sussman, chapter 6). Fifteen years ago, ethologists, sociobiologists, evolutionary psychologists and others did not have much archaeological data to support their hypothesis of war forever backwards, in which men killed other men to further their own reproductive success. They relied on ethnography, especially of the Yanomami (Chagnon, 1968; 1988), or war-mongering chimpanzees (Goodall 1986) or projections based on the Man the Hunter scenario (Lee & DeVore, 1968; cf. Fry, 2006; Hart & Sussman, 2009). But in 1996, a major book brought archaeology to the fore in this discussion, and seemingly proved the omnipresence of war among non-state peoples.

Keeley's (1996) *War Before Civilization* forcefully asserts that war is and was ubiquitous among non-state peoples. Although most of his material is drawn from ethnography, Keeley's Figure 6.2 (1996, pp. 90–91) graphs percentage of deaths from warfare in nine archaeological cases. Noting that some war deaths would not leave recoverable traces, he concludes that actual prehistoric death tolls "probably ranged from about 7 percent to as much as 40 percent of all deaths." Male percentages, of course, would be greater. This graph is an empirical cornerstone of much subsequent theorizing. (For critiques of Keeley, see Carman & Carman, 2005; Chapman, 1999; Pearson, 2005; Thorpe, 2005).

LeBlanc with Register (2003) followed with a second foundational book, *Constant Battles,* which claims that "*everyone* had warfare in *all* time periods" (2003, p. 8, emphasis in original), and attributes war to the Malthusian tendency of population growth overrunning and degrading natural resources. Both books, as well as many other writings, assert that a neo-Rousseauian tendency—of which I am supposedly the standard bearer—in anthropology and archaeology has artificially "pacified the past." (Keeley, 1996, pp. 17–24, 163–171; LeBlanc, 2007; LeBlanc with Register, 2003, pp. 3–8).[1] In often caustic tones, these and others denounce peace-oriented, politically-correct, advocates-instead-of-scientists, who fail to look for signs of war, or ignore them when found, or define them away as symbolic or ritualistic. In some cases, I believe, the evidentiary "pacification of the past" has been true in *archaeology*—though not in the writings of cultural anthropologists for at least 40 years (see Ferguson 1997; 2006, p. 475). Yet many archaeologists have diligently searched for signs of violence for years, and their work informs this chapter.

Archaeologists accustomed to discussing and debating among themselves seem not to be aware of how central the idea of war forever backwards is in a small industry of scholarship, which claims to plumb the depths of the human mind and behavior. The proposition that war was common and deadly enough to act as a selection mechanism on our species is *axiomatic* in evolutionary psychology. Founders of the field Tooby and Cosmides (2010, p. 191) state the common conception:

> War is found throughout prehistory (LeBlanc with Register 2003; LeBlanc 1999; Keeley 1996). Wherever in the archaeological record there is sufficient evidence to make a judgment, there traces of war are to be found. It is found across all forms of social organization—in bands, chiefdoms, and states. It was a regular part of

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The Convergence of Evolutionary and Cultural Views

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hunter-gatherers life wherever population densities were not vanishingly low, and often even in harsh marginal habitats.

They also invoke chimpanzees and tribal people such as the Yanomami—as do most of the authors noted in this section, in varying combinations. They then use this established "fact" to explain the evolution of a wide range of specialized, innate cognitive modules, including those for hate, anger, coalitional politics, and morality.

Van Vugt (2008, p. 5) premises his argument that human males have an evolved "male warrior complex" with: "Fossil evidence of human warfare dates back at least 200,000 years, and it is estimated that as many as 20–30% of ancestral men died from intergroup violence (Keeley, 1996)." Winegard and Deaner (2010, p. 434) citing Keeley and Bowles (another key writer, see below), claim that "male mortality due to warfare is estimated at between 13 and 30% in traditional societies," and use that to explain "sport fandom." Bracha, Bienvenu, and Eaton (2007, p. 2) state that in "mid-Paleolithic intergroup warfare, victors killed a high percentage of post-pubertal males (estimates range from 15% to 50%) and took reproductive-age females (and some children) captive (LeBlanc with Register, 2003)." Their "Paleolithic-human-warfare hypothesis" is posited to explain "evolved adaptations that lead to blood-injection phobia" among contemporary pre-menopausal women. Boyer and Bergstrom (2011, p. 1037) invoke archaeological findings of high levels of deadly violence to explain the development of threat detection in children; Kanazawa (2009, p. 26–27) to argue that evolved tendencies to capture women in war explains contemporary civil wars; Goetz (2010, p. 16) to construct a theory of status and domestic violence; Snyder, Fessler, Tiokhin, Frederick, Lee, and Navarrete (2011, p. 127) to account for women's fear of crime; Navarrete, et al. (2010, pp. 933–935) to explain gender specific aspects of race bias; and Low (2000, p. 13) as the selective basis for a whole spectrum of innate gender differences. Moreno (2011) argues that mitochondrial haplotypes associated with ritual fighting, murder, and warfare gave the human "culture or tribe" that spread out of Africa a competitive advantage over any others. This list could easily be expanded (also see Jones, De Bruine, Little, Watkins, & Feinberg, 2011, p. 1204; Potts & Haydon, 2008, pp. 152–156; Smirnov, Arrow, Kennett, & Orbell, 2007, p. 929; Wilson, 1999, p. 18), but the point is made—it is taken as established archaeological fact that somewhere around a quarter of all males died in war throughout prehistory, and that such a death rate is more than enough to be a selection mechanism.

This perspective is not confined to evolutionary psychology proper. Several prominent political theorists apply the same data to explain contemporary international relations. Fukuyama (1998, pp. 24–27) combines discussion of chimpanzees and Yanomami with Keeley to make the point that a "feminized" foreign policy could be dangerous in a world of males evolved to be bad. Thayer (2004) is unusual in having read some archaeology beyond the few touchstone pieces, and sometimes seems to say war had a relatively recent inception (2004, pp. 118–119). Yet he falls back on long-term selection by war to explain patterns of contemporary international relations, such as

xenophobia and ethnocentrism (2004, pp. 254–261). Gat (2006, p. 12; 2009, p. 574)—whose work has become a foundational source in itself—cites Keeley, LeBlanc, and of course chimpanzees, as having vanquished the neo-Rousseauians. For him, the pervasiveness of war throughout humanity's evolutionary past has produced an integrated motivational complex including practically any reason one could imagine for collective violence (cf. Ferguson 2000). Goldstein (2011, p. 38) prefaces his arguments about stopping war by quoting LeBlanc, "the foremost authority . . . and other experts agree: 'Twenty-Five percent of deaths in warfare [among adult men] may be a conservative estimate. Prehistoric warfare was common and deadly, and no time span of geographical region seems to have been immune.'"

The ubiquity of ancient war is argued to have selected for not only aggressive, violent behavior, but for *cooperation* as well. War is, after all, a supremely cooperative behavior, where one's life or death may depend on the actions of one's fellows. This is not a new idea, but it has been given new salience in a series of publications by Bowles and colleagues (Bowles, 2006; Bowles & Gintis, 2011, pp. 102–196; Choi & Bowles, 2007). Importantly for this chapter, Bowles presents his own compilation of adult mortality due to war (which only partly overlaps with Keeley's) in 15 prehistoric areas (Bowles, 2009, p. 1295). Death rates range from 0 to 46 percent. He and colleagues make a group-selection argument that the average number of deaths in external conflict is capable of explaining the evolution of altruistic, group-beneficial but self-detrimental behaviors—like going to war. Pinker, as usual, has made a big, public splash in the evolutionary pool. In *The Blank Slate* (2002, p. 56), he made his evolutionary position clear, "Hobbes was right, Rousseau was wrong," and approvingly quotes William James: "We, the lineal representatives of the successful enactors of one scene of slaughter after another, must, whatever more pacific virtues we may also possess, still carry about with us, ready at any moment to burst into flame, the smoldering and sinister traits of character by means of which they lived through so many massacres, harming others, but themselves unharmed."

The Better Angels of Our Nature (2011, pp. 1, 48–49), opens with archaeological illustrations of the "shockingly violent" human past. After discussing the supposed evolutionary logic of deadly competition, he returns to archaeology (plus chimpanzees and recent tribals) as the ultimate foundation of his claim that humans naturally tend toward violence—and we still do today—but those primitive impulses have been thwarted and controlled by the forces of modernity. Pinker's list of archaeological evidence, in his Figure 2–2, combines citations from Keeley (1996) and Bowles (2009), producing 21 prehistoric cases, to calculate an average prehistoric death-from-warfare rate as 15 percent (2011, pp. 48–49). The claim that 15 percent of prehistoric populations died in war supports his earlier claim of killer instincts, and provides a springboard for his new book, to show how much nicer we have become than our base nature. This is the most comprehensive list of archaeological data putatively establishing the ubiquity of high-casualty warfare throughout the human past. Given all the publicity for the book, it will surely be widely read, and that is why this chapter is titled Pinker's List.

Archaeologists carefully slogging through the evidence must realize that this is how the findings of their discipline are being portrayed and used to make sweeping claims about human nature and society. Archaeological findings are said to prove that prehistoric people in general were plagued by chronic warfare that regularly claimed about 15 percent of total population, and a quarter or more of the adult men. These numbers have become axiomatic. The point of this chapter, along with chapter 11, is to demonstrate, with abundant evidence, that this "fact"—as widely invoked as it is—is utterly without empirical foundation (see also Dye, chapter 8; Haas & Piscitelli, chapter 10). To use the word favored by opponents of "pacification of the past," the axiom is a *myth*. The clear and present danger is that the past is being artificially "warrified."

This chapter shows that Pinker's List consists of cherry-picked cases with high casualties, clearly unrepresentative of prehistory in general. Chapter 11 shows the results of a more representative approach. By considering the *total* archaeological record of prehistoric populations of Europe and the Near East up to the Bronze Age, evidence clearly demonstrates that war began sporadically out of warless condition, and can be seen, in varying trajectories in different areas, to develop over time as societies become larger, more sedentary, more complex, more bounded, more hierarchical, and in one critically important region, impacted by an expanding state.

The Death List

Pinker's (2011, p. 49) List compiles data from Keeley and Bowles to include 21 cases. One case has no killings, and it will be shown that six more of the 21 cases can be tossed out. The others, valid cases of multiple violent deaths, will be shown to be a very selective compilation of high-killing situations, in no way representative of "typical" war casualties of prehistoric people in general. In the following discussion, cases will be presented in approximate chronological order. The initial number in parentheses is the place of the case in Pinker's List, followed by percentage of deaths, and (K) for the source of Keeley (1996, p. 197) or (B) for Bowles (2009, online supporting material p. 4). (Keeley calculates on the basis of total number of individuals, and Bowles on adults only. That does make a difference, but it is a complication not worth engaging for present purposes).

(2) 40.7 percent (K) Jebel Sahaba Nubia, Site 117; and (20) 2.3 percent (K) near Site 117.

Since it was described in 1968, at the height of Ardrey-ism, Site 117 has stood as the earliest conclusive evidence of war, regularly noted as 12,000–10,000 BC. In the final Paleolithic graveyard, remains of 24 out of 59 men, women and children, have lithic material interpreted as parts of projectiles either embedded in or closely associated with their skeletons. Several are in multiple burials (1968, pp. 990, 993). There is no reason to challenge this as evidence of war, but it is unique in its early occurrence and death rate, and given its importance, some questions do need to be raised.

First is the early date. There is no direct dating of 117 remains. The lithics, however, closely resemble the Qadan industry, estimated at 13,000–5000 BC. If 117 came near the end of this 8,000-year span, it would still be early, but later than other evidence for war from Europe and the Near East. The narrowing of time to 12,000–10,000 BC is based on further similarity of 117 lithics to those of another site, ANE-1. ANE-1 itself is dated by complicated inferences: a lithic sequence and chronology which is "highly tentative," and the relative frequency of associated Late Pleistocene faunal remains, which could coincide with a known Nile aggradation event (Wendorf, 1968, pp. 990–991). The aggradation event, which seems firm around 12,000–10,000 BC (Burleigh & Matthews, 1982, 159–160; Wendorf, Schild, & Haas, 1979, p. 222), is the only basis of putting a year to Site 117. But the linkage is tenuous. This soft dating would not be a big deal, were it not for the fact that on that basis rests 117's claim of being the earliest war anywhere. If the early date is correct, it puts the Jebel Sahaba cemetery within a major ecological crisis, as the Nile cut a gorge that eliminated the previous broad spectrum subsistence base, including marsh resources. After this, the area was entirely abandoned by humans (Ferguson, 2006, pp. 482–483).

Then there are the lithics themselves, 110 associated with skeletons, plus 73 more in the fill (Wendorf, 1968, pp. 959, 982). These are not "arrowheads" but presumably glued or tied to shafts in microlithic fashion. For that purpose, they are remarkably poorly made. Ninety-seven pieces are unretouched chips and flakes (Wendorf, 1968, p. 988). "In a normal assemblage all of these would be classified as debitage or debris, and none would be considered tools" (Wendorf, 1968, p. 991). "Evidently, any pointed thin flake was on occasion employed as a point, and any piece with a thin sharp edge could serve as a barb" (Wendorf, 1968, p. 992). But the lithic material also includes scrapers (Wendorf, 1968, p. 991), and nine cores or core fragments (Wendorf, 1968, pp. 979, 983). Their physical position relative to bones is key for Wendorf, yet some are found inside skulls, with no entry wounds (1968, pp. 971, 973). Classifying all those with associated lithics as war casualties is going too far. Jurmain (2001, p. 20), a judicious specialist in paleo-osteology, concludes the number of violent deaths actually should be counted as 4 out of 41 relatively complete skeletons, or 9.8 percent.

Yet if they were all war deaths, their number raises the question of how that population could have survived. Noting that, Wendorf suggests that this was a special burial area for those who died violently, not for everyone (1968, p. 993). He supports that inference by noting (Pinker case #20) that in a similar cemetery just across the Nile, with 39 skeletons, there was "almost no evidence of violence," with only one likely victim (1968, p. 993). All questions considered, this Nubian record really is overdue for systemic reconsideration—although it seems that the key remains with embedded flakes are now absent from the collection (Judd, 2006, p. 162). Taking it as it has been presented, Site 117 stands as good evidence of very early war, but it is unique in the world for that

combination of antiquity and carnage (see Haas & Piscitelli, chapter 10). Pinker's #20 is based on just one individual. In principle, one single violent death in a sample cannot be taken as evidence of war, since one killing could occur in many ways. That brings the list down from 21 to 20 cases.

(21) 0.0 percent (B) Gobero, Niger.

Some 200 individuals were recovered from several lakeside cemeteries from 9700 to 4500 BC. Although there is one triple burial, none show indications of violent death (Sereno et al., 2008, p. 10). This is the only case with no deaths in Pinker's combination of the Keeley and Bowles figures, raising the question of why Bowles included it, when other sequences without signs of violence are not. This brings the number of cases with war to 19.

(4) 22 percent (B) Voloshkoe; and (5) 15.9 percent (K)/ 21 percent (B) Vasilyevka, Ukraine.

Voloshkoe and two cemeteries at Vasilyevka, along the Dnieper rapids, are the earliest European locations showing signs of war. (All European cases are considered in context in chapter 11, and these two, like Jebel Sahaba, are from a period of ecological crisis. Only their unusual character is noted here.) At Voloshkoe, of 19 individuals, 5 have some combination of embedded or associated points and missing appendages (26.3 percent). At Vasilyevka I, 1 (or 2) of 19, and at Vasilyevka III, 5 of 44 have embedded or closely associated points (9.5 percent/11.1 percent for I and III combined (Lillie, 2004, pp. 87–91). (Bowles's percentage is for Vasilyevka III, but based on adults only). These Dnieper sites indicate a very high rate of death by violence, but they are hardly typical. Vasilyevka III is radiocarbon calibrated at 10,000–9,035 BC, and its materials seem somewhat younger than Vasilyevka I and Voloshkoe (Lillie, 2001, pp. 56; 2004, pp. 88–91). That puts the Dneiper rapids warfare right around the transition from Pleistocene to Holocene. Dolukhanov, thoroughly familiar with Eastern European archaeology from Paleo to Neolithic (1997), calls this "the earliest indisputable evidence of warfare" (1999, p. 79). In fact, it is the earliest in all of Europe, (and second earliest in the world). Earlier, contemporary, and later findings discussed in chapter 11 show it to be an outstanding exception to the general record.

(18) 1.7 percent (K) Calumnata, Algeria.

In this case, 2 out of 60 individuals, from 6300–5350 BC, are said to have died from violence, one from a projectile and one from apparently intentional fractures. Keeley, Pinker's source, bases this on a secondary account. The primary source (Dastugue, 1970, pp. 122–126), however, concludes that the irregular cranial fracture probably did *not* come from a weapon, but a collision with something like a jagged rock. (Another individual had a massive fracture suggesting enormous pressure.) As for the flint tip embedded in a vertebrae, given the absence of anything else suggesting war, the author suggests a case of homicide. One death does not indicate war, and the List is down to 18.

(11, 12) 8.0 percent (K) Brittany; and 12 percent (B) Ile Teviec, France.

These two cases in Pinker are actually the same site, which has been presented with different information and dates in Keeley and Bowles. The List is now 17. Teviec, c. 4625 BC, has 23 or 25 individuals (the basis of Keeley's percentage), with 16 adults (the basis of Bowles's). One appears to have died from two projectiles. One has traces of blows on the cranium, and another has a partially healed hole (Dastugue & de Lumley, 1976, p. 617; Newell, Constandse-Westermann, & Meiklejohn, 1979, pp. 132–137; Vencl, 1991, pp. 220, 222). Since there were signs of healing, including this as a death is questionable—but to avoid seeming picky, I leave this case in the List. Teviec takes us into the later European Mesolithic, into major societal changes contemporary with transformations in landscape and food sources associated with mid-Holocene (5000–3000 BC) climate fluctuations in temperature and rainfall (Barber, Chambers, & Maddy, 2004). As discussed in chapter 11, the Mesolithic has acquired a (debated) reputation as being especially violent (cf. Roksandic, 2004), and is said to be the time when war began (Vencl, 1999). Teviec displays signs of "complex hunting and gathering," such as increasing sedentism, reliance on aquatic resources (shellfish), and hierarchical differentiation. (Bender, 1985, p. 23). Ethnographically, complex hunter-gatherers have a well-established reputation of being prone to war, in sharp contrast to nomadic hunter-gatherers (Kelly, 1995, pp. 303, 311–315, Kelly, chapter 9; see also Fry, chapter 1).[2]

(10) 12 percent (B) Bogebakken, Denmark; (9) 13.6 percent (K) Vedback, Denmark; and (14) 3.8 percent (K) Skateholm I, Sweden.

Once again, two of Pinker's separate cases, Bogebakken and Vedback, are actually one and the same. Now Pinker's tally is cut to 16. Older carbon dates for Vedback Bogebakken range from 4300–3800 BC, but calibrated 4800–4400 is more accurate (Schulting, personal communication). In one triple burial of a man, woman, and child, the man has a bone arrowhead between the vertebrae of the neck. Albrethson and Peterson (1976, p. 20) count only that one as due to violence, but given the circumstances, I will settle on a compromise figure of two. Skateholm I, just 80 km. from Vedback and perhaps 200 years earlier, has 2 out of 53 individuals with embedded projectile points (Albrethson & Petersen, 1976, pp. 4, 7–8, 14, 20; Newell, Constandse-Westermann, & Meiklejohn, 1979, pp. 47, 50; Price, 1985, pp. 351–352). Both are late Mesolithic, from the Ertebolle tradition, which has produced several other instances of non-lethal violence (Thorpe, 2003, p. 172; 2005, p. 11). But once again, Ertebolle is unusual in that sense. In Thorpe's survey of trauma in Europe and elsewhere, he notes: "reaching southern Scandinavia, the overwhelming impression

is of a significantly higher level of conflict visible in the archaeological record than in the areas considered before" (2005, p. 11)—not typical of prehistoric peoples. Even so, in contrast to selecting only sites with signs of violence, if all skeletal remains from the Ertebolle tradition were pooled, then the percentage of violent instances would be much less.

Across the Atlantic: Representative Cases, or Extremes?

The remaining cases from Pinker's combined list take us into the New World (with one exception), and to much more recent times. In several cases, settlement information that was lacking in earlier cases is discussed. The North American record of violence across regions is very complicated, with different kinds of indicators, suggesting different sorts and intensities of violence, present/absent or rising/falling at different times (see Ferguson, 2006, p. 490–495; Lambert, 2002, pp. 211–230). The PaleoIndians of 11000–5000 BC were not free of interpersonal violence. Kennewick Man from 7000–5500 BC (McManamon 1999) and an approximate contemporary from Grimes Burial Shelter (Owsley & Jantz, 2000) both have embedded points. But PaleoIndian remains display a remarkable uniformity of Clovis style tools, "from Maine to Mexico, and from the East Coast to the West," which as Haas (1999, p. 14) emphasizes is uncharacteristic of people who have divided into competitive/violent groups. Evidence of war in the Eastern Woodlands dates to several thousand years before it appears in the American Southwest (Haas, 1999, p. 23). War in the Southwest is one of the best studied of all areas (see Haas, 1990; Haas & Creamer, 1997; LeBlanc, 1999; Rice & LeBlanc, 2001), but it is temporally and geographically complicated, interrupted by long periods of peace. The northern Great Plains has some of the most extreme evidence of mass killings from anywhere in the prehistoric world (see below). Yet in the southern Plains, prior to 500 AD, of 173 skeletal remains, only one shows signs of violent death, a woman with two blows to the head (calculated from Owsley, Marks, & Manhein, 1989, pp. 116–119). The North American record foregrounds the question of representativeness of particular cases.

(16) 5.6 percent (K) Kentucky.

The earliest evidence of war in North America comes from the Eastern Woodlands, where discussion benefits from Milner's (1999, pp. 120–122) exhaustive search for all signs of violence (and see Dye, 2009, pp. 49–85; Dye, chapter 8; Lambert, 2002, pp. 226–227; Milner, 2007, pp. 191–195). In the Early Archaic period, 8500–6000 BC, there are only scattered signs of interpersonal violence, although skeletal remains are limited. In the Middle Archaic, 6000–3000 BC, with greatly expanded skeletal collections, scattered violence continues. The earliest suspicion of war comes from the Windover cemetery in central Florida, about 5400 BC, where 9 of 168 individuals show signs of violence, mostly healed cranial and forearm fractures, but with one embedded point (Dickel, Aker, Baron, & Doran, 1988). A sequence of major climate changes

beginning in the mid-Holocene led to extensive landscape modification, which was followed by social transformations in the late Middle and Late Archaic (3000–1000 BC), including larger populations, increased sedentism, a shift to foraging focused on especially favorable locations such as wetlands or rivers surrounded by much less productive regions, incipient cultivation, long distance exchange of elite goods, physical distance between groups, and internal status differentiation (Dye 2009, pp. 51–67; Dye, chapter 8; Winters, 1974, pp. x–xii; Jefferies, Thompson, & Milner, 2005, p. 20; Milner, 2007, pp. 191–192). In other words, the later Middle Archaic has most of the preconditions for war (see chapter 11).

Skeletal indicators of conflict and war increase in this period, though still at far lower levels than found post-500 AD. Pinker's example, Indian Knoll, Kentucky, 4100–2500 BC (Winters, 1974, p. xix), is one of just three cases noted as having multiple deaths, with 48 of 880 burials having embedded points, mutilations, and/or multiple interments (Webb, 1974, pp. 147–155, 173–205).[3] By the subsequent Middle Woodland period (100 BC–400 CE), increased cultivation was accompanied by what seems to be a time of peace. "Skeletons with conflict-related wounds are known from this time horizon, but they are quite uncommon relative to the innumerable burials that have been excavated" (Milner, 1999, p. 122). Violence phased back in during the Late Woodland period (400–1000 CE), leading up to the chronic chiefly warfare and massive fortifications of the Mississippian period, prior to Western contact. Indian Knoll, then, is not representative or typical of prehistoric violence, it is extraordinary in the number and percentage of war deaths, at least until the Mississippian era (see Bridges, 1996; Dye, 2006, 2009).

(9) 22.7 percent–32.4 percent 30 sites from British Columbia, 3500 BC–1774 AD, averages calculated from different sets by (K) and (B).

Both Keeley and Bowles draw on numerous excavations from the Pacific Northwest Coast. In my first publications on war (1983, 1984b), I described a pre-contact pattern of intensive, high casualty warfare, patterned by demographics and resource distribution (such as salmon streams), which affected the whole structure of society, and had roots going back at least three thousand years. I picked this area to study because of the striking intensity of war at the time of Western contact (and after). Archaeological research since then has provided an abundance of evidence from different locales and periods: skeletons with embedded points, multiple traumas, trophy taking, specialized weapons, settlement nucleation, movement to defendable sites, refuges, fortifications, territorial marking and separation, and militaristic iconography (Ames & Maschner, 1999, pp. 195–218; Coupland, 1989; Cybulski, 1992; 1994, pp. 80–83; Lovisek, 2007; Moss & Erlandson, 1992). There is no doubt that specific locations on the Pacific Northwest Coast had casualties at the level claimed to express innate human aggressiveness. But this region cannot be taken as typifying hunter-gatherers throughout prehistory. Instead, the Northwest Coast has become the type-case for "warlike" *complex* hunter-gatherers (Fry, chapter 1).

Another problem is in the *averaging* of cases, which in this rich archaeological record show tremendous variation. The basic picture is outlined by Ames and Maschner (1999, pp. 209–211). There are some suggestions of violence in the sparse archaeological findings prior to 4400 BC, but not enough to draw any conclusions. In the Early Pacific period, 4400–1800 BC, 8 out of 12 adult males show signs of some sort of violence at Namu, not necessarily lethal; but at Blue Jackets Creek series on the Queen Charlotte Islands, there is "virtually no trauma," (Cybulski, 1992, pp. 157–158). Signs of war multiply as populations grow through the Middle Pacific (1800 BC–200/500 AD), though they concentrate in the Northern Coast around Prince Rupert Harbor, where there are iconographic indications of a militaristic ideology. Middle Pacific war signs are much fewer in the south around the Straits of Georgia, where resources are less concentrated and less variable, and their military orientation seems consistent with defense against northern raiders. In the Late Pacific, beginning around 500 CE, with elaborating cultural complexity, major climatic fluctuations, and the inferred arrival of the bow and arrow, there is a profusion of settlement defenses, and war becomes common even in the south. While many details of this complicated picture are debated, it is generally accepted that war developed in some northern locations became more intense over time, and gradually spread to the south. The prehistoric Pacific Northwest Coast was indeed characterized by intensive warfare, but averaging all cases conceals the great spatial and temporal variation. On the question of representativeness, in terms of the high number of victims of violence, and the continuation of war signs (in some areas) for over three thousand years, the Northwest Coast may be fairly characterized as the most warlike region in all North America—except perhaps the region of Central and Southern California, coming up shortly.

(3) 30 percent (B) Sarai Nahar Rai, India.

Geographically interrupting the North American record is a single case from among the voluminous record of South Asian human remains (see Kennedy, 2000). Put at 3140–2854 BC, it is called Mesolithic. The claimed death rate of 30 percent puts this near the top of Pinker's list. This is highly questionable. Three out of the eight well-preserved skeletons are the basis of the claim (Sharma, 1973, pp. 138–139). One is clear-cut, with an embedded microlith. The two others have microliths resting on the pelvic girdle, or alongside the humerus. Not only are microliths found as grave offerings here, but the burials were also packed with dirt from hearths, which contained many microliths from cooking game. Under these circumstances, only the embedded point is good evidence of violence. As noted, one individual is inadmissible as evidence of war. Pinker's List is down to 15.

(15) 6 percent (B) Southern California, 28 sites, 3500 BC–1380 AD; (17) 5 percent (K, B) Central California, 1500 BC–500AD; (13) 8 percent (B) Central California, 1400 BC–235 AD; and (19) 4 percent (B) Central California, 2 sites, 240–1770 AD.

These four cases, including many individual sites, come from western California, spanning about 5,000 years. Pinker's #17 reflects a broad estimate by Moratto (1984, pp. 183–184), summarizing all Central California remains from the Middle Horizon (2000 BC–500 AD), and estimating a prevalence of projectile wounds >5 percent. Pinker's #19, from two Central California sites, is based on reports by Jurmain (1991, 2001). At Ala-329, (500–1700 AD), 10 of 440 individuals, and at CA-SCI-038, (21 BC-1770 AD), 6 of 162 show signs of projectile wounds. The first problem is that Pinker's #13 is based on a study (Andrushko, Schwitalla, & Walker, 2010) of trophy-taking and dismemberment, using a data base of 13,453 individuals from all Central California sites from 3000 BC to 1700 AD. This data set encompasses the times and places covered by Moratto and Jurmain. One could justifiably cite Moratto and Jurmain separately, or Andrushko and colleagues alone, but one cannot count two cases and a summary including those sites as three different studies. Subtracting only one, this brings Pinker's List down to 14.

Both Central and Southern California have long been recognized for exceptional rates of violence among prehistoric peoples. After discussing projectile wounds from other areas, Jurmain (2001, p. 14) comments: "In the New World, the most frequent occurrence of such projectile lesions, however, has been observed at sites in California. Indeed, especially from sites in both central and southern California, the incidence of such lesions is as high as for any region in the world."[4] Andrushko and colleague's (2010, pp. 85, 88, 91) study of mutilation and trophy-taking is powerful evidence for the development of cultural traditions of violence, and probably war. Signs of trophy-taking are found for all times over a five-thousand-year period, (76 individuals, or .56 percent of the sample), but they are entirely absent in Southern California. Within Central California, trophy taking is fifteen times more frequent in the Early/Middle Transition period (500–200 BC) than before or after, which the authors associate with the rise of hierarchical social structure, and migrations of outside groups into the area. Yet other explanations besides war, such as sacrifice or chiefly punishment, should not be ruled out for this kind of data, especially since only 6 of the 76 victims had a projectile point associated with the remains, and considering the nearness of Mesoamerica.[5]

Southern California (Pinker's #15), today known as the Chumash area for its historic population, is also known for violence, but in different forms, and with different timing. The major finding (Lambert, 1997, pp. 82, 89–97) from 30 sites dating from 6000 BC to 1804 AD in the Santa Barbara area and Channel Islands, is a pattern of healed cranial fractures indicating non-lethal fights, compared by the author to the Yanomami. Only 2 percent of the skull fractures are perimortem. As discussed in chapter 11, a consistent record (here 98 percent) of *healed* cranial trauma cannot be taken as a diagnostic of war, since it could equally result from a non-lethal mechanism of conflict resolution (Fry & Szala, Chapter 23). Projectile wounds, in contrast, do suggest lethal intent, and are found in 58 individuals out of 1,744, or 3.3 percent. (Again, Bowles calculates a higher percent by restricting the cases used to adults). Forty-three percent of those

have multiple wounds. Projectile wounds come from all periods, but peak dramatically from 580–1380 AD. Given the variability and temporal sweep of these studies, chronological generalizations are difficult. Still, the earliest records show less violence compared to later, and findings are not inconsistent with a major increase in warfare after 500 AD—as already mentioned regarding British Columbian fortifications, and the fading peace of the Eastern Middle Woodlands. Lambert and Walker (1991, pp. 970–971) and Walker & Thornton (2002, p. 515) see localized periods of higher violence as tied to local markers of climatic change and nutritional stress, and to the spread of the bow and arrow (cf. Gamble, 2005). Increasing warfare for a millennium before the European intrusion is common across North America, and major climate change is often temporally linked to those increases. For the current purpose of evaluating Pinker's List, the points are: rates of violence in prehistoric California are far above most comparable North American sites; and within California, they show great variability in practice, and become more common going from earlier to later periods.

(1) 60 percent (K) Crow Creek, South Dakota; (7) 16.3 percent (K) Illinois; and (8) 15 percent (K) Northeast Plains.

At Crow Creek in South Dakota, hundreds were massacred (Willey, 1990, pp. xv, 486). Originally dated to 1325 AD, it is more probably a few decades later (Bamforth, 2006, p. 75). All of the 486 individuals of the agricultural Coalescent Tradition appear to have been killed at the same time. (The 60 percent figure is based on an estimated total village population). This is the highest level of casualties in Pinker's List. It is also "the largest archaeologically recovered massacre in the world" (Willey, 1990, p. xx). The next case is from Norris Farms #36, a cemetery along the middle Illinois River containing 264 burials from about 1300 AD, where 43 individuals appear to have died violently based on projectile points, unhealed major trauma, and/ or animal scavenging marks indicating the bodies were originally left exposed (Milner, Anderson, & Smith, 1991). In Milner's (1999, p. 114) comprehensive survey of war signs in the Eastern Woodlands, he characterizes Norris Farms as the "one notable exception to the general pattern of low casualties." The third case, Northeast Plains, Pinker dates at a mid-point of 1485, but this is another problematic case. The death estimate comes from Keeley, who puts it at 1325–1650 AD, on the sole basis of the following sentence from Wiley (1990, p. xxiv): "Owsley (1988), using a sample of over 700 skeletons from Coalescent Tradition cemeteries, found indications of scalping on as many as 15 percent of the series." "Owsley (1988)" is an abstract of a conference presentation. Repeated efforts to get clarification of the contents of that presentation were unsuccessful. After considering Owsley's publications (1977; 1994a; 1994b), which do not provide any figure or date matching Wiley's description, it seems possible that this figure includes the remains from Crow Creek. Crow Creek, however, is already counted. Since the overlap is not confirmed, this case will remain on the list, but any early Coalescent

instances in Owsley's sample would have been subject to the same conditions as applied at Coalescent Crow Creek.

Crow Creek and Norris Farms must be put in context to evaluate their representativeness. In the Eastern forest, the peace of the Middle Woodlands period gave way to returning signs of violence in the Late Woodlands after 500 CE, but greater temporal resolution is difficult. In the northern Plains, there are very few signs of violence until after 900 AD. In both regions, a major shift to defensively located and fortified villages began around 1050, and continued for centuries (Bamforth, 2006, p. 81; Lambert, 2002, p. 224; Milner, 1999, pp. 122–123). These war signs coincide with the Mississippian period, beginning between 800 and 900 AD, and continuing until the invasion of Europeans. From the midwest to southeastern United States, the Mississippian and surrounding traditions were marked (with local variations) by larger populations, big planned settlements, intensive maize cultivation, use of maritime resources, elaborate ceremonialism, mound-building, chiefly hierarchies, and large-scale warfare.

The increase in fortifications coincides with critical climatic instability for larger horticultural populations. Increasingly detailed reconstructions indicate five distinct periods of drought lasting 40 to 60 years between 1030 and 1600 CE (Bamforth, 2006, p. 73). Both Crow Creek (Bamforth, 2006, p. 67) and Norris Farms (Milner et al., 1991, p. 591) skeletons show clear signs of nutritional stress. These late prehistoric developments come at a time of greatly intensified violence linked to climatic perturbations across much of North America. Yet even in these violent times, Crow Creek and Norris Farms are noted as extreme in their levels of violence (Milner, 1999, pp. 114–117; Lambert, 2002, pp. 225–228). They are not representative, even in this especially violent time.

Conclusion

So let us look back over Pinker's list. Of the original 21, Gobero, Niger is out because it has no war deaths. Three cases, the burial ground across the Nile from Site 117, Sarai Nahar Rai, India, and Calumnata Algeria are all eliminated because they only have one instance of violent death. One site each was dropped because of duplication in Brittany, southern Scandinavia, and California. That leaves two-thirds of the original List, 14 examples, which purportedly represent average war mortality among "prehistoric people." Jebel Sahaba, the two cases from the Dnieper gorge, and Indian Knoll are all highly unusual in their very early dates and number of casualties, when compared to other contemporary locations, including 117's neighbor's cemetery (see Ferguson, chapter 11). Three European sites are from the Mesolithic, which has gained a reputation for violence compared with earlier and later cultures, and two of those are from the Ertebolle tradition, which has an established reputation of being especially violent even within the Mesolithic. Four cases (compiled from many more individual sites) are from the Pacific coast, British Columbia, and Southern-Central California, all of which have higher levels of violence than any other

long-term North American sequence, and which still show great variations by time and place. The final three are from Illinois and South Dakota or thereabouts, which, even during the most violent centuries in the entire sequence of prehistoric North America, stand out as the extreme points of warfare killings.

Is this sample representative of war death rates among prehistoric populations? Hardly. It is a selective compilation of highly unusual cases, grossly distorting war's antiquity and lethality. The elaborate castle of evolutionary and other theorizing that rises on this sample is built upon sand. Is there an alternative way of assessing the presence of war in prehistory, and of evaluating whether making war is the expectable expression of evolved tendencies to kill? Yes. Is there archaeological evidence indicating war was absent in entire prehistoric regions and for millennia? Yes. The alternative and representative way to assess prehistoric war mortality is demonstrated in chapter 11, which surveys all Europe and the Near East, considering *whole* archaeological records, not selected violent cases. When that is done, with careful attention to types and vagaries of evidence, an entirely different story unfolds. War does not go forever backwards in time. It had a beginning. We are not hard-wired for war. We learn it.

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Notes

1. I am the only person identified among "a handful of social anthropologists [who] have recently codified this vague prejudice into a theoretical stance that amounts to a Rousseauian declaration of universal prehistoric peace" (Keeley, 1996, p. 20).
2. Although Kelly (1995) correctively emphasizes the danger of generalizing about nomadic hunter-gatherers, or projecting any contemporary people as representatives of prehistory, they are still the best window we have into ways of life over human evolutionary history.
3. The other two cases are a cluster of seven Late Archaic sites around Kentucky Lake in Tennessee, where 10 out of 439 individuals died violently, or 2.3 percent (Smith, 1997, pp. 250–252); and an unpublished thesis on Creek Tennessee reports three males with points and mutilation in one grave, though no population figures are available (Dye, 2009, p. 62).
4. I could not find enough information to comment on any preconditions for war in times as early as Middle Horizon, although later prehistory (Moratto, 1984, pp. 171–172) is characterized by the Mesolithic/complex hunter-gather-like preconditions of war: seasonal sedentism; broad-spectrum foraging using wetlands and streams, and especially salmon runs like on the Northwest Coast; central locations with "ceremonial lodges or chief's residences;" and occupation by distinct and geographically separated ethnicities (see chapter 11).
5. A more widespread pattern of taking heads as trophies was historically associated with many different California groups, and the similarity of associated ritual across language divides is a good illustration of spreading cultural practices of war (Lambert, 2007).

References

Albrethson, E. A., & Petersen, E. B. (1976). Excavation of a Mesolithic cemetery at Vedbaek, Denmark. *Acta Archaeologica, 47,* 1–28.

Ames, K. M., & Maschner, H. G. D. (1999). *Peoples of the Northwest Coast: Their archaeology and prehistory.* London: Thames and Hudson.

Andrushko, V. A., Schwitalla, A. W., & Walker, P. L. (2010). Trophy-taking and dismemberment as warfare strategies in prehistoric central California. *American Journal of Physical Anthropology, 141,* 83–96.

Bamforth, B. B. (2006). Climate, chronology, and the course of war in the middle Missouri region of the North American Great Plains. In E. N. Arkush, & M. W. Allen (Eds.), *The archaeology of warfare: Prehistories of raiding and conquest* (pp. 66–100). Gainesville, FL: University Press of Florida.

Barber, K. E., Chambers, F. M., Maddy, D. (2004). Late Holocene climatic history of northern Germany and Denmark: Peat macrofossil investigations at Dosenmoor, Schleswig-Holstein, and Svanemose, Jutland. *Boreas, 33,* 132–144.

Bender, B. (1985). Prehistoric developments in the American midcontinent and in Brittany, northwest France. In T. D. Price, & J. A. Brown (Eds.), *Prehistoric hunter-gatherers: The emergence of cultural complexity* (pp. 21–57). Orlando, FL: Academic Press.

Bowles, S. (2006). Group competition, reproductive leveling, and the evolution of human altruism. *Science, 314,* 1569–1572.

Bowles, S. (2009). Did warfare among ancestral hunter-gatherers affect the evolution of human social behavior? *Science, 324,* 1293–1298.

Bowles, S., & H. Gintis (2011). *A cooperative species: Human reciprocity and its evolution.* Princeton: Princeton University Press.

Boyer, P. & B. Bergstrom (2011). Threat-detection in child development: An evolutionary perspective. *Neuroscience and Biobehavioral Reviews, 35,* 1034–1041.

Bracha, H. S., Bienvenu, O. J., & Eaton, W. W. (2006). Testing the Paleolithic-human-warfare hypothesis of blood-injection phobia in the Baltimore EA follow-up study—Towards a more etiologically-based conceptualization of DSM-V. *Journal of Affective Disorders, 97,* 1–4.

Bridges, P. S. (1996). Warfare and mortality at Koger's Island, Alabama. *International Journal of Osteoarchaeology, 6,* 66–75.

Burleigh, R., & K. Matthews (1982). British Museum natural radiocarbon measurements XIII. *Radiocarbon, 24,* 151–170.

Carman, J., & P. Carman (2005). War in prehistoric society: Modern views of ancient violence. In M. P, Pearson, & I. J. N. Thorpe (Eds.), *Warfare, violence and slavery in prehistory: Proceedings of a Prehistoric Society conference at Sheffield University, BAR International Series, 1374,* 217–224. Oxford: Archaeopress.

Chagnon, N. (1968). *Yanomamō: The fierce people.* New York: Holt, Rinehart, Winston.

Chagnon, N. (1988). Life histories, blood revenge, and warfare in a tribal population. *Science, 239,* 985–992.

Chapman, J. (1999). The origins of warfare in the prehistory of Central and Eastern Europe. In J. Carman, & A. Harding (Eds.), *Ancient Warfare* (pp. 101–142). Stroud: Sutton Publishers.

Choi, J-K, & S. Bowles (2007). The coevolution of parochial altruism and war. *Science, 318,* 636–640.

Coupland, G. (1989). Warfare and social complexity on the Northwest Coast. In D. Claire, & B. C. Vivian (Eds.), *Cultures in conflict: Current archaeological perspectives* (pp. 205–214). Calgary: University of Calgary Archaeological Association.

Cybulski, J. S. (1992). *A Greenville burial ground: Human remains and mortuary elements in British Columbia coast prehistory.* Hull, Quebec: Canadian Museum of Civilization.

Cybulski, J. S. (1994). Culture change, demographic history, and health and disease on the Northwest Coast. In C. S. Larsen and G. R. Milner (Eds.), *In the wake of contact: Biological responses to conquest* (pp. 75–85). New York: John Wiley and Sons.

Dastugue, J. (1970). Pathologie des hommes de Columnata. In Chamla, M.C., *Les hommes epipaleolithiques de Columnata (Algerie Occidental). Memoires du Centre de Recherches Anthropologiques Prehistoriques et Ethnographiques, 15,* 118–126.

Dastugue, J., & M-A. de Lumley (1976). Las maladies des hommes prehistoriques du Paleolithique et du Mesolithique. In H. de Lumley (Ed.) *La prehistoire Francaise* (pp. 612–622). Paris: Editions du Centre National de la Recherche Scientifique.

Dickel, D. N., C. G. Aker, B. K. Baron, & G. H. Doran (1988). An orbital floor and ulna fracture from the Early Archaic of Florida. *Journal of Paleopathology, 2,* 165–170.

Dolukhanov, P. M. (1997). Landscape at the Mesolithic-Neolithic transition in the boreal East European plain. In J. Chapman and P. Dolukhanov (Eds.), *Landscapes in flux: Central and Eastern Europe in antiquity,* (pp. 289–306). Oxford: Oxbow Books.

Dolukhanov, P. M. (1999). War and peace in prehistoric Eastern Europe. In J. Carman, & A. Harding (Eds.), *Ancient Warfare* (pp. 73–87). Stroud: Sutton Publishers.

Dye, D. (2006). The transformation of Mississippian warfare: Four case studies from the mid-South. In E. N. Arkush, & M. W. Allen (Eds.), *The archaeology of warfare: Prehistories of raiding and conquest* (pp. 101–147). Gainesville, FL: University Press of Florida.

Dye, D. (2009). *War paths, peace paths: An archaeology of cooperation and conflict in Native Eastern North America.* Lanham, MD: Altamita Press.

Ferguson, R. B. (1983). Warfare and redistributive exchange on the Northwest Coast. In E. Tooker, (Ed.) *The development of political organization in Native North America: 1979 proceedings of the American Ethnological Society* (pp. 137–147). Washington: American Ethnological Society.

Ferguson, R. B. (1984a). Introduction: Studying war. In R. B. Ferguson (Ed.), *Warfare, culture, and environment* (pp. 1–81). Orlando: Academic Press.

Ferguson, R. B. (1984b). A re-examination of the causes of Northwest Coast warfare. In R. B. Ferguson (Ed.), *Warfare, culture, and environment* (pp. 267–328). Orlando: Academic Press.

Ferguson, R. B. (2001). Materialist, cultural and biological theories on why Yanomami make war. *Anthropological Theory, 1,* 99–116.

Ferguson, R. B. (2006). Archaeology, cultural anthropology, and the origins and intensifications of war. In E. N. Arkush, & M. W. Allen (Eds.), *The archaeology of warfare: Prehistories of raiding and conquest* (pp. 469–523). Gainesville, FL: University Press of Florida.

Ferguson, R. B. (2011). Born to live: Challenging killer myths. In R. W. Sussman and C. R. Cloninger (Eds.), *Origins of altruism and cooperation* (pp. 249–270). New York: Springer.

Fry, D. P. (2006). The human potential for peace: An anthropological challenge to assumptions about war and violence. New York: Oxford University Press.

Fukuyama, F. (1998). Women and the evolution of world politics. *Foreign Affairs, 77*(5), 24–40.

Gamble, L. H. (2005). Culture and climate: Reconsidering the effect of palaeoclimatic variability among southern California hunter-gatherer societies. *World Archaeology, 37,* 92–108.

Gat, A. (2006). *War in human civilization.* New York: Oxford University Press.

Gat, A. (2009) So why do people fight? Evolutionary theory and the causes of war. *European Journal of International Relations, 15,* 571–599.

Goetz, A. T. (2010). The evolutionary psychology of violence. *Psicothema, 22,* 15–21.

Goldstein, J. S. (2011). *Winning the war on war: The decline of armed conflict worldwide.* New York: Penguin.

Goodall, J. (1986). *The chimpanzees of Gombe: Patterns of behavior.* Cambridge, MA: Belknap Press.

Haas, J. (1990). Warfare and the evolution of tribal polities in the prehistoric Southwest. In J. Haas (Ed.), *The anthropology of war* (pp. 171–189). Cambridge: Cambridge University Press.

Haas, J. (1999). The origins of war and ethnic violence. In J. Carman, & A. Harding (Eds.), *Ancient Warfare* (pp. 11–24). Stroud: Sutton Publishers.

Haas, J., & Creamer, W. (1997). Warfare among the Pueblos: Myth, history, and ethnography. *Ethnohistory, 44,* 235–261.

Jefferies, R. W., V. D. Thompson, & G. R. Milner (2005). Archaic hunter-gatherer landscape use in west-central Kentucky. *Journal of Field Archaeology, 30,* 3–23.

Jones, B. C., DeBruine, L. M., Little, A. C., Watkins, C. D., & Feinberg, D. R. (2011). "Eavesdropping" and perceived male dominance rank in humans. *Animal Behavior, 81,* 1203–1208.

Jurmain, R. (1991). Paleodemography of trauma in a central California population. In D. J. Ortner, & A. C. Aufderhiede (Eds.), *Human paleopathology: Current synthesis and future options* (pp. 241–248). Washington: Smithsonian Institution Press.

Jurmain, R. (2001). Paleoepidemiological patterns of trauma in a prehistoric population from central California. *American Journal of Physical Anthropology, 115,* 13–23.

Kanazawa, S. (2009). Evolutionary psychological foundations of civil wars. *The Journal of Politics, 71,* 25–34.

Keeley, L. H. (1996). *War before civilization: The myth of the peaceful savage.* New York: Oxford University Press.

Kelly, R. L. (1995). *The foraging spectrum: Diversity in hunter-gatherer lifeways.* Washington: Smithsonian Institution Press.

Kennedy, K. A. R. (2000). *God-apes and fossil men: Paleoanthropology in Southeast Asia.* Ann Arbor: University of Michigan Press.

Lambert, P. M. (1997). Pattern of violence in prehistoric hunter-gatherer societies of coastal southern California. In D. L. Martin, & D. W. Frayer (Eds.), *Troubled times: Violence and warfare in the past* (pp. 77–109). New York: Columbia University Press.

Lambert, P. M. (2002). The archaeology of war: A North American perspective. *Journal of Archaeological Research, 10,* 207–241.

Lambert, P. M. (2007). Ethnography and linguistic evidence for the origins of human trophy taking in California. In R. J. Chacon, & D. H. Dye (Eds.), *The taking and displaying of human body parts as trophies by Amerindians* (pp. 65–89). New York: Springer.

Lambert, P. M., & P. L. Walker (1991). Physical anthropological evidence for the evolution of social complexity in coastal Southern California. *Antiquity, 65,* 963–973.

LeBlanc, S. A. (1999). *Prehistoric warfare in the American Southwest.* Salt Lake City: University of Utah Press.

LeBlanc, S. A. (2007). Why warfare? Lessons from the past. *Daedalus,* Winter, 13–21.

LeBlanc, S. A., & Register, K. E. (2003). *Constant battles: The myth of the peaceful, noble savage.* New York: St. Martin's Press.

Lee, R. B., & DeVore, I. (Eds.), (1968). *Man the hunter.* New Brunswick, NJ: Transaction Press.

Lillie, M. C. (2001). Mesolithic cultures of Ukraine: Observations on cultural developments in light of new radiocarbon determinations from the Dnieper Rapids cemeteries. In K. J. Fewster, & M. Zvelebil (Eds.), *Ethnoarchaeology and hunter-gatherers: Pictures at an exhibition, BAR International Series, 955,* 53–63. Oxford: Archaeopress.

Lillie, M. C. (2004). Fighting for your life? Violence at the late-glacial to Holocene transition in Ukraine. In M. Roksandic (Ed.), *Violent interactions in the Mesolithic: Evidence and meaning, BAR International Series, 1237,* 89–93. Oxford: Archaeopress

Lovisek, J. A. (2007). Human trophy taking on the Northwest Coast: An ethnohistorical perspective. In R. J. Chacon, & D. H. Dye (Eds.), *The taking and displaying of human body parts as trophies by Amerindians* (pp. 45–64). New York: Springer.

Low, B. S. (2000). *Why sex matters: A Darwinian look at human behavior.* Princeton: Princeton University Press.

McManamon, F. (1999). The initial scientific examination, description, and analysis of the Kennewick Man human remains. http://www.nps.gov/archeology/kennewick/mcmanamon.htm, accessed 03/07/12

Milner, G. R. (1999). Warfare in prehistoric and early historic eastern North America. *Journal of Archaeological Research, 7,* 105–151.

Milner, G. R. (2007). Warfare, population, and food production in prehistoric eastern North America. In R. J. Chacon, & R. G. Mendoza (Eds.), *North American indigenous warfare and ritual violence,* (pp. 182–201). Tucson: University of Arizona Press.

Milner, G. R, Anderson, E., & Smith, V. G. (1991). Warfare in late prehistoric west-central Illinois. *American Antiquity, 56,* 581–603.

Moratto, M. J. (1984). *California Archaeology.* Orlando: Academic Press.

Moreno, E. (2011). The society of our "out of Africa" ancestors (I): The migrant warriors that colonized the world. *Communicative & Integrative Biology, 4,* 163–170.

Moss, M. L., & Erlandson, J. M. (1992). Forts, refugee rocks, and defensive sites: The antiquity of warfare along the North Pacific Coast of North America. *Arctic Anthropology, 29,* 73–90.

Navarette, C. D., McDonald, M. M., Molina, L. E., & Sidanius, J. (2010). Prejudice at the nexus of race and gender: An outgroup male target hypothesis. *Journal of Personality and Social Psychology, 98,* 933–945.

Newell, R. R., Constandse-Westermann, T. S., & Meiklejohn, C. (1979). The skeletal remains of Mesolithic man in Western Europe: An exhaustive catalogue. *Journal of Human Evolution, 8,* 1–228.

Owsley, D. W. (1977). Ethnographic and osteological evidence for warfare at the Larson Site, South Dakota. *Plains Anthropologist, 22,* 119–131.

Owlsey, D. W. (1988). Osteological evidence for scalping in Coalescent Tradition populations of the Northern Plains. Paper presented at the 46th Annual Plains Conference. (Abstract cited in Willey 1990).

Owsley, D. W. (1994a). Warfare in Coalescent Tradition populations of the Northern Plains. In D.W. Owsley, & R. L. Jantz (Eds.), *Skeletal biology in the Great Plains: Migration, warfare, health, and subsistence* (pp. 333–334). Washington: Smithsonian Institution Press.

Owsley, D. W. (1994b). Osteology of the Fay Tolton Site: Implications for warfare during the Initial Middle Missouri Variant. In D.W. Owsley, & R. L. Jantz (Eds.), *Skeletal biology in the Great Plains: Migration, warfare, health, and subsistence* (pp. 335– 353). Washington: Smithsonian Institution Press.

Owsley, D.W, & Jantz, R. L. (2000). Biography in the bones: Skeletons tell the story of ancient lives and peoples. *Scientific American Discovering Archaeology*. January/February, 56–58.

Owsley, D. W., Marks, M. K., & Manhein, M. H. (1989). Human skeletal samples in the Southern Great Plains. In J. L. Hofman, R. L. Brooks, J. S. Hays, D. W. Owsley, R. L. Jantz, M. K. Marks, & M.H. Manheim (Eds.), *From Clovis to Comanchero: Archaeological overview of the Southern Great Plains* (pp. 111–122). U.S. Army Corps of Engineers, Southwestern Division.

Pearson, M. P. (2005). Warfare, violence and slavery in later prehistory: An introduction. In M. P. Pearson, & I. J. N. Thorpe (Eds.), *Warfare, violence and slavery in prehistory: Proceedings of a Prehistoric Society conference at Sheffield University, BAR International Series, 1374*, 19–33. Oxford: Archaeopress

Pinker, S. 2002. *The blank slate: The modern denial of human nature*. New York: Viking.

Pinker, S. 2011. *The better angels of our nature: Why violence has declined*. New York: Viking.

Potts, M., & T. Hayden (2008). *Sex and war: How biology explains warfare and terrorism and offers a path to a safer world*. Dallas: Benbella Books.

Price, T. D. (1985). Affluent foragers of Mesolithic southern Scandinavia. In T. D. Price, & J. A. Brown (Eds.), *Prehistoric hunter-gatherers: The emergence of cultural complexity*, (pp. 341–363). Orlando, FL: Academic Press.

Rice, G. E., & S. A. LeBlanc (Eds.) (2001). *Deadly landscapes: Case studies in prehistoric southwestern warfare*. Salt Lake City: University of Utah Press.

Roksandic, M. (2004). Introduction: How violent was the Mesolithic, or is there a common pattern of violent interactions specific to sedentary hunter-gatherers? In M. Roksandic (Ed.), *Violent interactions in the Mesolithic: Evidence and meaning, BAR International Series, 1237*, 1–7. Oxford: Archaeopress.

Sereno, P. C., Garcea, E. E. A. A., Jousse, H., Stojanowski, C. M., Saliege, J-F., Maga . . . A. Stivers, J. P. (2008). Lakeside cemeteries in the Sahara: 5000 years of Holocene population and environmental change. *PLoS One, 3*(8), 1–22.

Sharma, G. R. (1973). Mesolithic lake cultures in the Ganga Valley, India. *Proceedings of the Prehistoric Society, 39*, 129–146.

Smirnov, O. H., Arrow, H., Kennett, D. & Orbell, J. (2007). Ancestral war and evolutionary origins of "heroism." *The Journal of Politics, 69*, 927–940.

Smith, M. O. (1997). Osteological indications of warfare in the Archaic period of the Western Tennessee Valley. In D. L. Martin, & D. W. Frayer (Eds.), *Troubled times: Violence and warfare in the past* (pp. 241–265). New York: Columbia University Press.

Snyder, J. K., Fessler, D. M. T., Tiokhin, L., Frederick, D. A., Lee, S. W., & Navarrete, C. D. (2011). Trade-offs in a dangerous world: Women's fear of crime predicts preferences for aggressive and formidable mates. *Evolution and Human Behavior, 32*, 127–137.

Thayer, B. A. (2004). *Darwin and international relations: On the evolutionary origins of war and ethnic conflict*. Lexington, KY: University Press of Kentucky.

Thorpe, I. J. N. (2003). Anthropology, archaeology, and the origin of warfare. *World Archaeology, 35*, 145–165.

Thorpe, I. J. N. (2005). The ancient origins of warfare and violence. In M. P. Pearson, & I. J. N. Thorpe (Eds.), *Warfare, violence and slavery in prehistory: Proceedings of a Prehistoric Society conference at Sheffield University, BAR International Series, 1374*, 1–18. Oxford: Archaeopress.

Tooby, J., & L. Cosmides (2010). Groups in mind: The coalitional roots of war and morality. In H. Hogh-Oleson (Ed.), *Human morality and sociality: Evolutionary and comparative perspectives* (pp. 191–234). New York: Palgrave MacMillen.

Van Vugt, M. (2008). Tribal instincts, male warriors, and the evolutionary psychology of intergroup relations. (Invited paper for Annals of New York Academy of Sciences, Special Issue on "Values and empathy across social barriers"). Retrieved from http://www.professormarkvanvugt.com/files/TribalInstinctsMaleWarriors and The Evolutionary PsychologyofIntergroupRelations-NewYorkAnnalsofAcademyofSciences-2008.pdf (March 30, 2012)

Vencl, S. (1991). Interpretation des blessures causees par les armes au Mesolithique. *L'Anthropologie, 95*, 219–228.

Vencl, S. (1999). Stone age warfare. In J. Carman, & A. Harding (Eds.), *Ancient Warfare* (57–72). Stroud: Sutton Publishers.

Walker, P. L., & Thornton, R. (2002). Health, nutrition, and demographic change in Native California. In R. H. Steckel, & J. C. Rose (Eds.), *The backbone of history: Health and nutrition in the Western Hemisphere*. Cambridge: Cambridge University Press.

Webb, W. (1974). *Indian Knoll*. Lexington: University of Kentucky.

Wendorf, F. (Ed.) (1968). *The prehistory of Nubia*. Dallas: Southern Methodist University Press.

Wendorf, F., Shild, R., & Haas, H. (1979). A new radiocarbon chronology for prehistoric sites in Nubia. *Journal of Field Archaeology, 6*, 219–223.

Willey, P. (1990). *Prehistoric warfare on the Great Plains: Skeletal analysis of the Crow Creek massacre victims*. New York: Garland Publishing.

Wilson, E. O. (1999). *Consilience: The unity of knowledge*. New York: Alfred Knopf.

Winegard, B., & Deaner, R. (2010). The evolutionary significance of Red Sox Nation: Sport fandom as a by-product of coalitional psychology. *Evolutionary Psychology, 8*, 432–446.

Winters, H. D. (1974). Introduction to the new edition, in W. Webb, *Indian Knoll* (pp. v–xxvii). Lexington: University of Kentucky.