

Chapter 9

Why War? Motivations for Fighting in the Human State of Nature

Azar Gat

Abstract The chapter addresses the causes of fighting among hunter-gatherers, whose way of life represents 99.5% of the history of the genus *Homo* and about 90% of that of *Homo sapiens sapiens*. Based on anthropological observations on the behavior of extant and recently extinct hunter-gatherer societies, compared with animal behavior, the chapter begins with somatic and reproductive causes. It proceeds to demonstrate that other motives, such as dominance, revenge, the security dilemma, and “pugnacity,” originally arose from the somatic and reproductive competition. Rather than being separate, all motives come together in an integrated motivational complex, shaped by the logic of evolution and natural selection.

9.1 Introduction

In contrast to long-held Rousseauite beliefs that reached their zenith in the 1960s with the writings of Konrad Lorenz (1966) and Niko Tinbergen (1968), widespread deadly violence within species – including humans (Keeley 1996, Gat 1999, 2006; LeBlanc and Register 2003) – has been found to be the norm in nature. What are the evolutionary rewards that can make this highly dangerous activity worthwhile? This question relates to the age-old philosophical and psychological inquiry into the nature of the basic human system of motivation. Numerous lists of basic needs and desires have been put together over the centuries (Hobbes *Leviathan*, Chap. 6, Maslow 1970; Burton 1990), but in the absence of an evolutionary perspective, they have always had something arbitrary and trivial about them. They lacked

A. Gat
Department of Political Science, Tel-Aviv University, Tel-Aviv, Israel
e-mail: Azargat@post.tau.ac.il

a unifying regulatory rationale that would suggest the reason why the various needs and desires came into being, or the way in which they related to one another. Arguing that the human motivational system as a whole should be approached from the evolutionary perspective, I examine what can be meaningfully referred to as the “human state of nature”, the 99.5% of the genus *Homo*’s evolutionary history in which humans lived in small kin groups as hunter-gatherers. In this “state of nature,” people’s behavior patterns are generally to be considered as having been evolutionarily adaptive. They form the biological inheritance that we later carried with us throughout history, when this inheritance constantly interacted with our staggering cultural development.

Although I shall survey the reasons for warfare among hunter-gatherers one by one, it is not my intention to provide yet another “list” of elements. Instead, I seek to show how the various reasons come together in an integrated motivational complex, shaped by the logic of evolution and natural selection for billions of years, including the two million-year history of our genus, *Homo*, and the tens of thousands of years of our species, *H. sapiens sapiens*. The aspects discussed include the pursuit of subsistence resources and reproduction as ultimate causes, and behaviors relating to dominance, revenge, the security dilemma, the supernatural, and playfulness, as proximate and subordinate causes that arise from the first.

9.2 Subsistence Resources

Competition over resources is a prime cause of aggression and deadly violence among humans, as in other animals. The reason for this is that food, water, and, to a lesser degree, shelter against the elements are tremendous selection forces. As Darwin, following Malthus, explained, living organisms, including humans, tend to propagate rapidly. Their numbers are checked only by the limited resources of their particular ecological habitats and by all sorts of competitors, such as conspecifics, animals of other species which have similar consumption patterns, predators, parasites, and pathogens.

When their environments suddenly expand, an unusual event in nature, demographic growth is dramatic. One of the best known examples is the rapid proliferation of Old World wildlife into new territories in the wake of the European age of discovery. Humans propagated equally dramatically in similar circumstances. As recently as several tens of thousands of years ago, the small groups that crossed over from Asia into North America propagated into hundreds of thousands and millions of people, filling up the Americas. Similarly, the small “founder groups” that arrived in the Pacific islands during the last two millennia, in most cases no more than a few dozens of people landing on each island, rapidly filled up their new habitats, increasing in numbers to thousands and tens of thousands.

Such dramatic “breaking of the barriers” was rare, however. Contrary to the Rousseauite imagination, humans, and animals, did not live in a state of primordial plenty. Even in lush environments, plenty is a misleading notion, for it is relative,

first, to the number of mouths that have to be fed. The more resource-rich a region is, the more people it attracts from outside, and the greater the internal population growth that takes place. As Malthus pointed out, a new equilibrium between resource volume and population size would eventually be reached, recreating the same tenuous ratio of subsistence that was the fate of most preindustrial societies throughout history. The concept of “territoriality,” which became popular in the 1960s (Ardrey 1966; Lorenz 1966; Tinbergen 1968), should be more subtly defined in this light. Among hunter-gatherers, territories varied dramatically in size – territorial behavior itself gained or lost in significance – in direct relation to the resources and resource competition. The same applies to high population density, another popular explanation in the 1960s for violence. Except in the most extreme cases, it is mainly in relation to resource scarcity that population density functions as a trigger for fighting. Otherwise, Tokyo and the Netherlands would have been among the most violent places on earth (Durham 1976; Dyson-Hudson and Smith 1978; Mueller 1983; Huntingford and Turner 1987; de Waal 1996).

Competition over resources existed in most hunter-gatherer cultures and sometimes escalated into conflict, mostly among, but occasionally also within, groups. This competition was largely about nourishment, the basic and most critical somatic activity of all living creatures, which often causes dramatic fluctuations in their numbers. Resource competition, and conflict, is not, however, a given quantity but a highly modulated variable. Resource competition and conflict change over time and place in relation to the varying nature of the resources available and of human population patterns in diverse ecological habitats. The basic question, then, is what the main scarcities, stresses, and hence, objects of human competition, are in any particular circumstances.

In extreme cases, such as the mid-Canadian arctic, where resources were highly diffused and human population density was very low, resource competition and conflict barely existed. In arid and semi-arid environments, like those of Central Australia, where human population density was also very low, water holes were often the main cause of resource competition and conflict. They were critical in times of drought, when whole groups of Aborigines are recorded to have perished. For this reason, however, there was a tendency to control them, also violently, even when stress was less pressing (Meggitt 1965b, p 42). In well-watered environments, where there was no water shortage and hence, no water competition, food often became the chief cause of resource competition and conflict, especially in times of stress, and also in expectation of and preparation for stress (Ember and Ember 1992: 242–262; also Hamilton 1975: 146). As Lounados (1997: 33) writes with respect to Aboriginal Australia: “In southwestern Victoria, competition between groups involved a wide range of natural resources, including territory, and is recorded by many early European observers throughout Victoria.” Lounados’s next sentence shows that his “competition” also includes “combat.”

The nature of the food in question varied with the environment. Still, it was predominantly meat of all sorts that was hotly contested among hunter-gatherers. This fact, which is simply a consequence of nutritional value, is discernible

throughout nature. Herbivores rarely fight over food, for the nutritious value of grass is too low for effective monopolization. Fruit, roots, seeds, and some plants that are considerably more nutritious than grass are often the object of competition and fighting, both among animals and humans. Meat, however, represents the most concentrated nutritional value in nature and is the object of the most intense resource competition: hence, the inherent state of competition and conflict found between Stone Age human hunters.

Let us understand more closely the evolutionary calculus that can make the highly dangerous activity of fighting over resources worthwhile. In our affluent societies, it might be difficult to comprehend how precarious people's subsistence in premodern societies was (and still is). The specter of hunger and starvation was ever-present. Affecting both mortality and reproduction, they constantly trimmed down population numbers. Thus, struggle over resources was very often evolutionarily cost-effective. The benefits of fighting also had to be matched against possible alternatives (other than starvation). One of them was to move elsewhere. This, of course, often happened, especially if one's enemy was much stronger, but this strategy had clear limitations. By and large, there were no "empty spaces" for people to move to. In the first place, the quality of space is not uniform, and the best, most productive habitats were normally already taken. One could be forced out to less hospitable environments, which may also be already populated by other less fortunate people. Indeed, finding empty niches required exploration, which again might involve violent encounters with other human groups. Furthermore, a move meant leaving a habitat with whose resources and dangers the group's members were intimately familiar, and traveling into uncharted environments. Such a change could involve heavy costs. Moreover, giving in to pressure from outside might establish a pattern of victimization. Encouraged by its success, the alien group might repeat and even increase its pressure. A strategy of conflict concerns not only the object presently in dispute but also the whole pattern of future relations. Standing for one's own might, in fact, mean lessening the occurrence of conflict in the future. No less, and perhaps more, than actual fighting, conflict is about deterrence.

Having discussed the possible benefits and alternatives of fighting, deterrence brings us to the costs side. Conflict becomes an evolutionarily more attractive strategy for those who resort to it to lower their risk of incurring serious bodily harm and death. Consequently, displays of strength and threats of aggressive behavior are the most widely used weapons in conflict, both among animals and humans. Furthermore, when humans, and animals, do resort to deadly violence, they mostly do so under conditions in which the odds are greatly tilted in their favor (Crofoot and Wrangham, this volume). Among animals, it is mostly the defenseless young, chicks and eggs that fall victim to deadly violence, whereas adult animals are very cautious of fighting to the finish with their peers for fear of self-injury. Among hunter-gatherer and other prestate societies, it is not the open-pitched battle but the raid and ambush that constitute the principal and, by far, the most lethal form of warfare. Asymmetrical fighting is the norm in nature, including the human state of nature (Gat 1999).

9.3 Reproduction

The struggle for reproduction is largely about access to sexual partners. There is a fundamental asymmetry between males and females in this respect, which runs through most of nature. At any point in time, a female can be fertilized only once. Consequently, evolutionarily speaking, she must take care to make the best of it. It is quality rather than quantity that she seeks. She must select the male who looks the best equipped for survival and reproduction, so that he will impart his genes, and his qualities, to the offspring. In those species, like the human, where the male also contributes to the raising of the offspring, his skills as a provider and his loyalty are other crucial considerations. In contrast to the female, there is theoretically almost no limit to the number of offspring a male can produce. He can fertilize an indefinite number of females, thus multiplying his own genes in the next generations. The main brake on male sexual success is competition from other males.

All this, of course, is only an abstract, around which sexual strategies in nature are highly diverse (Symons 1979; Daly and Wilson 1983; Ridley 1994; Buss and Malamuth 1996). Some species are highly polygynous; yet access to females can be more evenly spread, all the way down to pair-bonding. However, although pair-bonding reduces, it by no means terminates, male competition. In pair-bonding systems, the quality of the female partner also gains significance. If the male is restricted to one partner, it becomes highly important for him as well to choose the partner with the best reproductive qualities he can get: young, healthy, and optimally built for bearing offspring; that is, in sexual parlance, the most attractive female.

The need to take care of very slowly maturing offspring, which required sustained investment by both parents, turned humans towards pair-bonding. However, competition over the best female partners remains. Furthermore, humans, and men in particular, are not strictly monogamous. In the first place, males tend to have more than one wife when they can. Only a minority can, however. Although in most known human societies polygyny was legitimate, only a select few well-to-do men were able to support, and thus have, the extra wives and children. Second, in addition to official or unofficial wives, men tend to search for extramarital sexual liaisons with other women, married or unmarried.

How does all this affect human violent conflict and fighting? The evidence across the range of hunter-gatherer peoples tells the same story. Within the tribal groupings, women-related quarrels and violence were rife, often constituting the principal category of violence, and occasionally escalating to blood feuds and homicide. Incidents were caused by competition among suitors, by women's abduction and forced sex, by broken promises of marriage, and by jealous husbands suspicious of their wives' fidelity. Between groups, the picture was not very different and was equally uniform (but see Chapais, this volume). Warfare regularly involved the stealing of women, who were then subjected to multiple rape, or taken for marriage, or both.

So, hunter-gatherer fighting commonly involved the stealing and raping of women, but was this the cause or a side effect of hunter-gatherer fighting? In recent anthropological literature, this question has been posed by R.B. Ferguson in respect to Yanomamo warfare. Ferguson (1995: 355–358), who holds that warfare is caused by material reasons alone, has disputed Napoleon Chagnon’s claim that the Yanomamo fought primarily for women. Chagnon (1977: 123, 146), for his part, dismissed the materialist position, enlisting the testimony of Yanomamo men who had told him amused: “Even though we like meat, we like women a whole lot more!” However, even Chagnon wavered on occasions on whether Yanomamo warfare was really *about* women.

The Yanomamo are hunters and horticulturalists rather than pure hunter-gatherers. However, the fundamental question in dispute is relevant to pure hunter-gatherers as well. As argued here, this is a pointless question that has repeatedly led anthropologists to a dead end. It artificially takes out and isolates one element from the wholeness of the human motivational complex that may lead to warfare, losing sight of the overall rationale that underpins these elements. It is as if one were to ask what people are *really* after when they go to the supermarket: meat, bread, or milk (Ferguson 2000; Gat 2000). Both somatic and reproductive elements are present in humans; moreover, both these elements are intimately interconnected, for people must feed, find shelter, and protect themselves in order to reproduce successfully. Conflict over resources was at least partly conflict over the ability to acquire and support women and children, and to demonstrate that ability in advance, in order to rank worthy of the extra wives. Brian Hayden (1994) has advanced an anthropological model whereby simple resources in resource-rich societies are accumulated and converted to luxury items in an intensified competition for status, prestige, and power (see Plourde and Henrich, this volume). He could add women to the list of converted goods. Thus, competition over women can lead to warfare *indirectly* as well as directly. As with mass and energy in Einstein’s equations, resources, reproduction, and, as we shall see, status, are interconnected and interchangeable in the evolution-shaped complex that motivates people. Motives are mixed, interacting, and widely refracted. Nonetheless, it is the purpose of this chapter to show that this seemingly immense complexity and inexhaustible diversity can be traced back to a central core, shaped by the evolutionary rationale.

Wealth, status, matrimonial success, and power were interconnected among the “big men” of northern Australia (Hart and Pilling 1964: 18, 50). The same pattern applied to the “big men” (umialik) of the Eskimo hunter-gatherers of the Alaskan coast: “If he [an umialik] had more than one wife, his ties of blood and marriage were greater than those of others, and he could depend on many persons for support. Furthermore, by being an umialik he was a person whose opinions the others respected” (Oswalt 1967, p 178; also Burch 1974, p 6). A positive feedback mechanism was in operation. Chagnon (1979) has shown one way this mechanism worked with the Yanomamo, and Keen (1988: 290) has independently detected the same pattern among the Australian hunter-gatherers. The largest clans in a tribe, those comprising more siblings and cousins, acted on the principle of kin solidarity

vis-à-vis the rest of the tribe. They moved on to increase their advantage by controlling the leadership positions, resources, and marriage opportunities at the expense of the others. As a result, large clans tended to dominate a tribe, politically and demographically, over time. The notion that there is a self- and mutually reinforcing tendency which works in favor of the rich, mighty, and successful, facilitating their access to the “good things of life,” goes back a long way.

Polygyny was a significant factor in many hunter-gatherer societies. Australia constitutes our best laboratory. Its size, near complete isolation, and ecological diversity make it far superior to other, more recently studied and more publicized cases that are mostly confined to arid environments. Polygyny was legitimate among all the Aborigines tribes of Australia and highly desired by the men. However, comparative studies among the tribes show that men with only one wife comprised the largest category among married men, often the majority. Men with two wives comprised the second largest category. The percentage of men with three or more wives fell sharply, to around 10–15% of all married men, with the figures declining with every extra wife (Meggitt 1965a; Long 1970). To how many wives could the most successful men aspire? There was a significant environmental variation here. In the arid Central Desert, four, five, or six wives were the top. Five or six was also the top figure mentioned by Buckley for the Aborigines living in the region of Fort Philip (Melbourne) in the south-east in the early nineteenth century. However, in the more rich and productive parts of Arnhem Land and nearby islands in the north, a few men could have as many as 10–12 wives, and in some places, in the most extreme cases, even double that number. There was a direct correlation between resource density, resource accumulation and monopolization, social ranking, and polygyny (Berndt and Berndt 1964: 172; Hart and Pilling 1964, pp 17–18, 50; Meggitt 1965b, pp 78, 80–81; Morgan 1980, p 58; Keen 1982; Lournados 1988, p 151–152).

Data from other hunter-gatherer societies reveal a similar picture. Resource scarcity reduced social differentiation, including in marriage, but did not eliminate it. The leaders of the Aka Pygmies were found to be more than twice as polygynous as ordinary people, and to father more children (Betzig et al. 1991, p 410). Among the !Kung of the arid Kalahari Desert, polygyny was limited, but 5% of married men still had two wives (Daly and Wilson 1988: 285). Women-related feuds were the main cause of homicide among them. In the extremely harsh conditions of the mid-Canadian arctic, where resources were scarce and diffused, fighting over resources barely existed. Because of the resource scarcity, marriages among the native Eskimo were also predominantly monogamous. One study registered only three polygynies out of 61 marriages. Still, wife-stealing was a widespread, probably the main, cause of homicide and “blood feuds” among the Eskimos (Betzig et al. 1991). “A stranger in the camp, particularly if he was traveling with his wife, could become easy prey to the local people. He might be killed by any camp fellow in need of a woman” (Daly and Wilson 1988, p 222; citing Balikci 1970, p 182). Among the Eskimos of the more densely populated Alaskan Coast, abduction of women was a principal cause of warfare. Polygyny, too, was more common among them, although restricted to the few (Oswalt 1967, pp 178, 180, 182, 185, 187, 204;

Burch and Correll 1972, p 33; Dickemann 1979, p 363; Symons 1979, p 152; Nelson 1983, p 292, 327–329; Irwin 1990, pp 201–202). Strong *Ingalik* (“big men”) often had a second wife, and “there was a fellow who had five wives at one time and seven at another. This man was a great fighter and had obtained his women by raiding” (Betzig et al. 1991, p 410).

The resource-rich environment of the Northwest Coast accentuated resource competition and social ranking. Conflict over resources was therefore intense. However, resource competition was not disassociated from reproduction, but constituted, in fact, an integral whole with it. Women are not even mentioned in R. B. Ferguson’s elaborate materialist study of Northwest Coast Indian Warfare (1984). Nonetheless, they were there. Most natives of the Northwest Coast were monogamous. However, the rich, strong, and powerful were mostly polygynous. The number of wives varied from tribe to tribe, but “a number” or “several” is normally quoted, and up to 20 wives are mentioned in one case. The household of such successful men is repeatedly described as having been very substantial and impressive indeed. Furthermore, as is universally the case, the mainly female slaves taken in the raids and working for their captors also shared their masters’ bed (Drucker 1951, p 301, 1965, p 54; Krause 1970, p 154; Rosman and Rubel 1971, pp 16–17, 32, 110; Donald 1997, p 73).

Naturally, the increase in the number of a man’s wives generally correlated with his reproduction rate (number of children). Statistics for hunter-gatherers, beyond those already cited, are scarce, and most of the following derives from simple horticulturalists who may have had more impressive reproductive skews. Among the Xavante horticulturalists of Brazil, for example, 16 of the 37 adult males in one village (74 out of 184 according to a larger survey) had more than one wife. The chief had five, more than any other man. He fathered 23 surviving offspring who constituted 25% of the surviving offspring in that generation. Shinbone, a most successful man among the Yanomamo of the Orinoco basin, had 43 children. His brothers were also highly successful, so Shinbone’s father had 14 children, 143 grandchildren, 335 great grandchildren, and 401 great-great grandchildren, at the time of the research (Chagnon 1979; Symons 1979, p 143; Daly and Wilson 1983, pp 88–89, 332–333). Again, women are such a prominent motive for competition and conflict because reproductive opportunities are a very strong selection force indeed.

To be sure, this does not mean that people always want to maximize the number of their children. Although there is some human desire for children per se and a great attachment to them follows once they are born, it is mainly the desire for sex – Malthus’s “passion” – which functions in nature as the powerful biological proximate mechanism for maximizing reproduction. As humans, and other living creatures, normally engage in sex throughout their fertile lives, they have a vast reproductive potential, which, before the introduction of effective contraception, mainly depended on resource availability for its realization.

Polygyny (and female infanticide) created a scarcity of women and increased men’s competition for, and conflict over, them (Divale and Harris 1976).

In conjunction with the other motives surveyed here, this was a major reason for the high violent mortality rate among hunter-gatherers. Among Aboriginal Australian tribes, about 30% of the Murngin adult males are estimated to have died violently, and similar findings have been recorded for the Tiwi. The Plains Indians showed a deficit of 50% for the adult males in the Blackfoot tribe in 1805 and 33% deficit in 1858 (but by the nineteenth century, they already possessed guns and horses), while during the reservation period the sex ratio rapidly approached 50–50. Among the Eskimos of the central Canadian arctic, where group warfare was practically nonexistent, the rate of violent deaths, in the so-called “blood feuds” and “homicide,” was estimated at one per 1,000 persons per year, ten times the 1990 US rate which is the highest in the developed world. Among the !Kung of the Kalahari Desert, dubbed the “harmless people,” there were 22 cases of homicide in the period of study, 1963–1969; 19 of the victims were males, as were all of the 25 killers. This amounts to a rate of 0.29 person per 1,000 per year, and had been 0.42 before the coming of state authority, 3–4 times higher than the 1990 US rate (Gat 2006, pp 129–132, for references to this and the following paragraphs).

The data for prestate agriculturalists is basically the same. Among the Yanomamo, about 15% of the adults died as a result of inter and intragroup violence: 24% of the males and 7% of the females. The Waorani (Auca) of the Ecuadorian Amazon hold the registered world record: more than 60% of adult deaths were caused by feuding and warfare. Among the many peoples in Highland New Guinea, violent mortality estimates are very similar: among the Dani, 28.5% of the men and 2.4% of the women; among the Enga, 34.8% of the adult males; among the Goilala, whose total population was barely over 150, there were 29 (predominantly men) killed during a period of 35 years; among the Lowland Gebusi, 35.2% of the adult males and 29.3% of the adult females. Archeology unearths similar findings. In the Neolithic site of Madisonville, Ohio, 22% of the adult male skulls had wounds and 8% were fractured.

Another consequence of sexual deprivation in young adult males is their marked restlessness, risk-taking behavior, and belligerency. Young adult males are genetically inclined to greater risk-taking, for their matrimonial status-quo is highly unsatisfactory. They still have to conquer their place in life. Thus, they have always been the most natural recruits for violent action and war. Male murder rates peak in both London and Detroit – although 40 times higher in the latter – at the age of 25 (Daly and Wilson 1983, pp 92–97, 297–301; Jones 1993, p 92).

The interconnected competition over resources and reproduction is the *root* cause of conflict and fighting in humans, as in all other animal species. Other causes and expressions of fighting in nature, and the motivational and emotional mechanisms associated with them, are derivative of, and subordinate to, these primary causes, and *originally* evolved this way in humans as well. This, of course, does not make them any less “real” but only explains their function in the evolution-shaped motivational complex, and, thus, how they came into being. It is to these “second-level” causes and motivational mechanisms, directly linked to the first, that we now turn.

9.4 Dominance: Rank, Power, Status, Prestige

Among social animals, possessing higher rank in the group promises one a greater share in the communal resources, such as hunting spoils, and better reproductive opportunities. While there is considerable diversity among species, rank is hotly contested for that reason. It is the strong, fierce, and – among our sophisticated cousins, the chimpanzees – also the “politically” astute, that win status by the actual and implied use of force. Rivalry for rank and domination in nature is, then, a proximate means in the competition over resources and reproduction (Watts, this volume).

In determining one’s status, image and perception have always been as important as tangible reality. Thus, both overt and subtler displays of worth are a constant human activity. It is limited only by the desire to avoid the provocation of a negative social response, because other people as well jealously guard their honor in the social competition for esteem. In traditional societies in particular, people were predisposed to go to great lengths in defense of their honor. The slightest offense could provoke violence. Where no strong centralized authority existed, one’s honor was a social commodity of vital significance, affecting both somatic and reproductive prospects.

Does this mean that what people who strive for leadership or esteem “really” want is sexual opportunity or resources? Not necessarily. Wanting is subjective, and mentally it can be genuinely disassociated from ultimate evolutionary aims. For instance, people widely desire love and sex for their own sake rather than for the resulting offspring, whom they often positively, and even desperately, do not want. In the same way, the pursuit of rank and esteem in humans, as with animals, was closely associated with better somatic and reproductive prospects, and evolved as a proximate means for achieving them, even though the evolutionary aim often lacked conscious expression. Again, to remove all too prevalent misunderstandings regarding the evolutionary rationale, the argument, of course, is not that these behavior patterns are a matter of conscious decision and complex calculation conducted by flies, mice, lions, or even humans. It is simply that those who failed to behave adaptively became decreasingly represented in the next generations, and their maladaptive genes, responsible for their maladaptive behavior, were consequently selected against. The most complex structural engineering and behavior patterns have thus evolved in, and program, even the simplest organisms, including those lacking any consciousness (Dawkins [1976], 1989, pp 96, 291–292).

As with competition over women, competition over rank and esteem could lead to violent conflict indirectly as well as directly. For instance, even in the simplest societies people desired ornamental, ostentatious, and prestige goods. Although these goods are sometimes lumped together with subsistence goods, their social function and significance are entirely different. Body and clothes ornamentation are designed to enhance physically desirable features that function everywhere in nature as cues for health, vigor, youth, and fertility (Darwin [1871], 1962, pp 467–468, Low 1979, pp 462–487, Diamond 1992: Chap. 9). For example, artificial

coloring is used to enhance eye, lip, hair, and skin color; natural – and by extension, added – symmetrical, orderly, and refined features signal good genes, good nourishment, and high-quality physical design; tall and magnificent headgear enhances one’s size. It is precisely on these products of the “illusions industry” – cosmetics, fashion, and jewellery – that people everywhere spend so much money. Furthermore, where some ornaments are scarce and therefore precious, the very fact that one is able to afford them indicates wealth and success: hence, the source of what economist Thorstein Veblen, referring to early twentieth century American society, called “conspicuous consumption.” In Stone Age societies as well, luxury goods, as well as the ostentatious consumption of ordinary ones, became in themselves objects of desire as symbols of social status. For this reason, people may fight for them.

Indeed, plenty and scarcity are relative not only to the number of mouths to be fed but also to the potentially ever-expanding and insatiable range of human needs and desires. Human competition increases with abundance – as well as with deficiency – taking more complex forms and expressions, widening social gaps, and enhancing stratification. While the consumption capacity of simple, subsistence, products is inherently limited, that of more refined, lucrative ones is practically open-ended. One can simply move up the market.

9.5 Revenge: Retaliation to Eliminate and Deter

Revenge is one of the major causes of fighting cited in anthropological accounts of prestate societies. Violence was activated to avenge injuries to honor, property, women, and kin. If life was taken, revenge reached its peak, often leading to a vicious circle of death and counter-death.

How is this most prevalent, risky, and often bloody behavior pattern to be explained? From the evolutionary perspective, revenge is retaliation that is intended either to destroy an enemy or to foster deterrence against him, as well as against other potential rivals. This, of course, applies to nonphysical and nonviolent, as well as to physical and violent action. If one does not pay back on an injury, one may signal weakness and expose oneself to further injuries not only from the original offender but also from others. A process of victimization might be created. I suspect that experts would be able to tell us that a similar behavioral pattern occurs, if only rudimentarily, within other social species (Aureli et al. 1992). All the same, humans have far longer memories than do animals, and, thus, revenge – the social settling of accounts with those who offended them – assumes a wholly new level with them. Of course, depending on one’s overall assessment of the stakes and relative balance of power and if the challenger is much stronger than oneself, it is equally common for one to accept in silence an injury and the consequences of reduced status. This rationale applies wherever there is no higher authority that can be relied upon for protection, that is, in the so-called anarchic systems. In modern societies, it thus applies to the wide spheres of social relations in which the state or other

authoritative bodies do not intervene. In prestate societies, however, it applied far more widely to the basic protection of life and property.

But are people not driven to revenge by blind rage rather than by calculation? I raise this typical question only in order to reiterate the point which is all too often misunderstood with respect to the evolutionary rationale. Basic emotions evolved, and are tuned the way they are, in response to very long periods of adaptive selective pressures (Fessler and Gervais, this volume). They are proximate mechanisms in the service of somatic and reproductive purposes. To work, they do not need to be conscious, and the vast majority of them indeed are not – in humans – let alone in animals. Thus, the instinctive desire to strike back is a basic emotional response which evolved precisely because those who struck back – of course, within the limits mentioned above – were generally more successful in protecting their own. Indeed, this rationale is remarkably supported by the famous computerized game that found tit-for-tat the most effective strategy a player can adopt (Axelrod 1984).

Tit-for-tat poses a problem. One's offender cannot always be eliminated. Furthermore, the offender has kin who will avenge him, and it is even more difficult to eliminate them as well. In many cases, tit-for-tat becomes a negative loop of retaliation and counter-retaliation from which it is very hard to exit. One original offense may produce a pattern of prolonged hostility. Thus, retaliation might produce escalation rather than annihilation or deterrence. In such cases, fighting seems to feed on, and perpetuate, itself, bearing a wholly disproportional relation to its "original" cause. People become locked into conflict against their wishes and best interests. It is this factor that has always given warfare an irrational appearance that seems to defy a purely utilitarian explanation.

How can this puzzle be explained? In the first place, it must again be stressed that both the original offense and the act of retaliation arise from a fundamental state of interhuman competition that carries the potential of conflict, and is consequently fraught with suspicion and insecurity. Without this basic state of somatic and reproductive competition and potential conflict, retaliation as a behavior pattern would not have evolved. Indeed, sometimes revenge is merely a pretext for conflict emanating from more fundamental reasons. However, while explaining the root cause of retaliation, this does not in itself account for retaliation's escalation into what often seems to be a self-defeating cycle. A prisoner's dilemma-like situation is responsible for the emergence of such cycles. In the absence of an authority that can enforce mutually beneficial cooperation on people, or at least minimize their damages, the cycle of retaliation is often their only rational option, though, exposing them to very heavy costs, is not their best option.

Like any game, the prisoner's dilemma is predicated on its assumptions. It has proven so fruitful because it has been found that many situations in real life exhibit elements of the dilemma. Indeed, the prisoner's dilemma is of great relevance when explaining the war complex as a whole and not only that of revenge and retribution. Still, it ought to be emphasized that not all violent conflicts or acts of revenge fall under the special terms of the prisoner's dilemma. In the context of a fundamental resource scarcity, if one is able to eliminate, decisively weaken, or subdue the enemy, and consequently reap most of the benefits, then this strategy is better for

one's interests than a compromise. It is only when such a decisive result cannot be achieved that conditions similar to those specified by the prisoner's dilemma come into play.

9.6 Power and the Security Dilemma

Revenge or retaliation is an active reaction to an injury, emanating from a competitive and, hence, potentially conflictual basic state of relations. However, as Hobbes saw (*Leviathan*, Chap. 13), the basic condition of competition and potential conflict, which gives rise to endemic suspicion and insecurity, invites not only reactive but also preemptive response, which further magnifies mutual suspicion and insecurity. It must be stressed that the source of the potential conflict here is again of a "second level." It does not necessarily arise directly from an actual conflict over the somatic and reproductive resources themselves, but from the fear, suspicion, and insecurity that the potential of those "first-level" causes for conflict creates. Potential conflict can thus breed conflict. When the "other" must be regarded as a potential enemy, his very existence poses a threat, for he might suddenly attack one day. For this reason, one must take precautions and increase one's strength as much as possible. The other side faces a similar security problem and takes similar precautions.

Things do not stop with precautionary and defensive measures, because such measures often inherently possess some offensive potential, indirectly or directly. Indirectly, a defended home base may have the effect of freeing one for offensive action with less fear of a counter-strike – it reduces mutual deterrence. Directly, a defensive alliance, for example, may be transformed into an offensive one. Thus, the measures that one takes to increase one's security in an insecure world often decrease another's security and vice versa.

What are the consequences of this so-called "security dilemma"? (Herz 1950; Jervis 1978). In the first place, it tends to escalate arms races. Arms races between competitors take place throughout nature. Through natural selection, they produce faster cheetahs and gazelles; deer with longer antlers to fight one another; more devious parasites and viruses and more protected "hosts." Many of these arms races involve very heavy costs to the organisms, which would not have been necessary if it were not for the competition. This, for example, is the reason why trees have trunks. Trees incur the enormous cost involved in growing trunks only because of their intense struggle to outgrow other trees in order to get sunlight. As with humans, competition is most intense in environments of plenty, where more competitors can play and more resources be accumulated. This is why trees grow highest in the dense forests of the water-rich tropical and temperate climates.

Arms races often have paradoxical results. The continuous and escalating effort to surpass one's rival may prove successful, in which case the rival is destroyed or severely weakened, and the victor reaps the benefits. However, in many cases, every step on one side is matched by a counter-step on the other. Consequently,

even though each side invests increasing resources in the conflict, neither gains an advantage. This is called, after one of Alice's puzzles in Lewis Carroll's *Through the Looking-Glass*, the "Red Queen effect": both sides run faster and faster only to find themselves remaining in the same place. Arms races may, thus, become a prisoner's dilemma. If the sides gave up the hope of outpacing each other and winning the contest, they could at least save themselves the heavy costs incurred, which anyway cancel each other out. However, they are often unable to stop the race, because of suspicion, faulty communication, and inability to verify what exactly the other side is doing.

Thus arms races are, in general, the natural outcome of competition. The special feature of arm races created by the security dilemma is that their basic motivation on both sides is defensive. Again, one way to stop the spiral is to find a means to reduce mutual suspicion. Marriage ties used to be a standard measure for achieving this aim in all premodern societies (Chapais, this volume). Fostering familiarity and demonstrating good will through mutual friendly visits and ceremonial feasts were other prominent universal measures. For all that, suspicion and insecurity are difficult to overcome for the reasons already mentioned. Furthermore, even ostensibly friendly overtures sometimes turned out to be treacherous. However, there is another way to reduce the insecurity. Although both sides in the security dilemma may be motivated by defensive concerns, they may choose to actively preempt their opponents; that is, take not only defensive precautions but attack in order to eliminate or severely weaken the other side. Indeed, this option in itself makes the other side even more insecure, making the security dilemma more acute. Warfare can thus become a self-fulfilling prophecy. Since full security is difficult to achieve, history demonstrates that constant warfare can be waged, conquest carried afar, and power accumulated, all truly motivated by security concerns, "for defense." Of course, in reality motives are often mixed, with the security motive coexisting with a quest for gain.

The basic condition of interhuman competition and potential conflict thus creates "second-level" causes for warfare, arising from the first, such as the cycle of revenge and the security dilemma. This does not mean that actual competition over somatic and reproductive resources has to exist on every particular occasion for the security dilemma to flare up. Still, it is the prospect of such competition that stands behind the mutual insecurity, and the stronger the competition and potential conflict, the more intense the security dilemma will grow.

9.7 World-View and the Supernatural

But what about the world of culture that after all is our most distinctive mark as humans? Do not people kill and get killed for ideas and ideals? From the Stone Age on, the spiritual life of human communities has been imbued with supernatural beliefs, sacred cults and rituals, and the practice of magic. Here, the difference

between humans and other animals is the most marked, even if rudimentary culture forms already manifest themselves in primates and hominids. It should be noted, however, that the capacity for culture itself evolved as a biological adaptation, and its various forms undergo evolutionary selection, both biological and cultural.

The evolutionary status of religion is beyond our scope here. Like warfare, religion is a complex phenomenon which is probably the result of several different interacting factors. Some scholars believe religion to be detrimental for survival and hold that it emerged as a “bug,” “parasite,” or “virus” on *H. sapiens sapiens*’ advanced intellectual “software” (Dawkins [1976], 1989, pp 189–201, 329–331, 2006; Bowker 1995; Boyer 2001). By contrast, functionalist theorists, from Emile Durkheim on, have argued that religion’s main role was in fostering social cohesion, inter alia in war (Durkheim 1965; Ridley 1996: 189–193; Wilson 2002; Hayden 2003). In evolutionary terms, this means that in those groups in which common ritual and cult ceremonies were more intensive, social cooperation became more habitual and more strongly legitimized, which probably translated into an advantage in warfare.

But how did the hunter-gatherers’ supernatural beliefs and practices affect the reasons for conflict and fighting? I argue that on the whole they added to, sometimes accentuating, the reasons we have already discussed. The all-familiar glory of the gods, let alone missionary quests, never appear as reasons for hunter-gatherers’ warfare. These will appear later in human cultural evolution. The supernatural reason for fighting among hunter-gatherers most cited by anthropologists is fear and accusations of sorcery. It should be noted, however, that these did not appear randomly, but were directed against people whom the victim of the alleged sorcery felt had reasons to want to harm him. This, of course, does not necessarily mean that they really did. It certainly does not mean that these people actually did harm the victim by witchcraft. What it does mean is that competition, potential conflict, animosity, and suspicion were conducive to fears and accusations of sorcery. To further clarify the point, it is not that these “imagined” fears and accusations did not add to the occurrence of deadly violence beyond the “real” or potentially “real” causes that underlie them. They certainly did. But, to a greater degree than with the security dilemma, the paranoia here reflects the running amok of real, or potentially real, fears and insecurity, thus further exacerbating and escalating the war complex.

Supernatural elements sometimes came into play in connection with motives for warfare other than fear and insecurity. For instance, trespassing was often regarded in hunter-gatherer societies as an offense against a group’s sanctified territory. In other cases, an act of sacrilege against the clan’s totem was regarded as an insult to the clan itself. In both these instances, the supernatural element functioned as a sanctified symbol of less imagined goods: resources and honor. The totem was thus like an emblem or flag. Of course, in some cases, supernatural reasons were evoked as mere pretexts for other motives. However, even when they were not, the supernatural elements added an extra dimension to existing motives, taken from the realm of the spiritual and sanctified.

9.8 Playfulness, Adventurism, Ecstasy

For all that we have said about the evolution-shaped aims of warfare, do not people sometimes fight for no particular purpose, just for the fun of it, as a game, an outlet, arising from sheer pugnacity?

Playing and sports have often been regarded – indeed, defined – as purposeless, expressive, pure fun activity. What is its evolutionary logic? After all, it is an activity that consumes a great deal of energy for no apparent gain. In reality, though, its purpose is physical exercise and behavioral training for the tasks of life, such as hunting, escaping predators and natural dangers, fighting, nurturing, and social cooperation in all these. For this reason, in all mammalian species (distinctive for their learning ability and playing activity), it is the young who exhibit the most active and enthusiastic play behavior, compared with the more mature and experienced (Fagan 1981; Smith 1984; Huntingford and Turner 1987: 198–200). Since adaptive behaviors are normally encouraged by emotional gratifications, play and sport are generally enjoyable.

So, games and sports serve, among other things, as preparation for fighting. In this light, fighting may even be perpetrated in rare cases as playful training for more serious fighting. However, is fighting sometimes not perpetrated only for evoking the sort of emotional gratifications associated with play or sport behavior? Do emotional gratifications sometimes not take on an end of their own in perpetrating fighting? I claim that they do, but as an extension rather than a negation of the evolutionary logic.

In the first place, it should be borne in mind that even wholly playful or “expressive” fighting behavior developed within a general evolutionary context in which conflict was normal and fighting a distinct possibility and, therefore, a deeply rooted behavior pattern. In this respect, wholly “purposeless” violence is a “misplaced” or “misactivated” expression of a “normal,” evolution-shaped behavior. We shall return to this in a moment. Second, as with respect to accusations of sorcery, it should be noted that even seemingly purposeless violence is not purely random. It is much more often directed against aliens or competitors than against perceived friends. Thus again, it is often an extension of, or over-reaction to, a state of competition and potential conflict.

Still, allowing that some “purposeless,” “expressive” violence does exist, at least marginally, what does it mean to describe such behavior as “misplaced,” or “misactivated”? Surely, the intention is not to pass any sort of value judgment. Rather, the terms describe behavior which, while having an evolutionary root, is expressed out of its evolutionarily “designed” context, and thus is typically also maladaptive. But if so, how does it survive? In reality, maladaptive traits *are* constantly selected against. For this reason, their prevalence remains marginal. Still, they do exist. It is not only that natural selection is perpetual because of mutations, the unique gene recombination that occurs with every new individual, and changing environmental conditions; the main reason is that no mechanism, whether purposefully designed by humans or blindly by natural selection, is ever perfect, 100% efficient, or fully

tuned. Like any other design, the products of natural selection, for all their marvels, vary greatly in their level of sophistication, have limitations, flaws, and “bugs,” can only operate in a proximate manner, and are, thus, far from optimal. The only requirement they are bound to meet is that they are good enough to survive in a given environment and facing given competitive challenges. The emotional mechanisms controlling violence have all the above limitations. Thus, they can be triggered or “misactivated” into “purposeless,” “expressive,” “spontaneous,” or “misdirected” violence. However, like overeating or sleeplessness – to give more familiar examples – such behavior should be understood as a range of deviation from an evolutionarily shaped norm.

Ecstatic behavior is another case in point. Ecstasy is a feeling of elation and transcendence produced by an increasing flow of hormones such as adrenaline, serotonin, and dopamine. It reduces body sensitivity to pain and fatigue, raises its energy to a high pitch, and lowers normal inhibitions. In nature, ecstatic behavior can be produced during extreme bodily exertion, often associated with struggle and fighting. However, humans very early on found ways to arouse it artificially for the feel-good effect itself, for instance, through rhythmic dance or by the use of narcotic substances. In some cases, narcotic substances were consumed before fighting and in preparation for it; a few shots of alcohol before an assault was ordinary practice in most armies until not very long ago. However, in other cases, the ecstatic condition itself can breed violence; again, drunkenness greatly contributes to the occurrence of violence in many societies. Furthermore, in some cases, the sequence is reversed, with fighting entered into in order to produce ecstatic sensations. For example, in addition to “ordinary” reasons, such as money, females, social esteem, and so forth, this motivation plays a prominent role – often in conjunction with alcohol consumption – in perpetrating “purposeless” youth gangs’ violence. Again, what we have here is a mostly maladaptive outgrowth and deviation from an evolution-shaped behavioral pattern.

9.9 Cooperation in Fighting

Fighting in the human state of nature is carried out at the individual and group levels. Cooperation in fighting takes place among family, clan, and tribe (regional group) members. In principle, there are strong advantages to cooperation. In warfare, for example, there is a strong advantage to group size (Crofoot and Wrangham, this volume). However, the problem with cooperation throughout nature is that one has a clear incentive to “free ride” – reap the benefits of cooperation while avoiding one’s share in the costs. Three or four different mechanisms overlap to secure a measure of cooperation in hunter-gatherer groups.

First, as the theory of inclusive fitness predicts, people risk their lives in support of close kin, with whom they share more genes. Family members tend to support one another in disputes and clashes with members of other families. In interclan rivalry, clans which are intermarried are likely to support one another against other

clans. Companions for raids, the most common form of fighting among hunter-gatherers, come mainly from one's family and clan. The members of regional groups and confederation of regional groups, numbering in the hundreds and more, are not as closely related as family and clan members, and yet (weaker) cooperation among them takes place, particularly in conflict against alien regional groups. In part, the same logic that, in J.B.S. Haldane's famous formulation, makes it evolutionarily beneficial to sacrifice one's life in order to save more than two siblings or eight cousins, and take risks at even lower ratios, holds true for 32 second cousins, 128 third cousins, or 512 fourth cousins. This, in fact, is pretty much what a regional group is. Moreover, although not every member of the regional group is a close kin of all the others, the regional group is a dense network of close kinship through marriage ties (Chapais, this volume). Marriage links criss-cross the regional group, making families and clans ready to take risks in support of one another. Since most marriages take place within the regional group, there is a wide gap between the "us" of the tribe and outsiders (Hamilton 1975, p 144; Silverman 1987, p 113; Bowles 2006). Hunter-gatherers only felt safe to go where they had kin.

Secondly, social cooperation can be sustained in groups that are intimate enough to allow mutual surveillance and social accounting. If detected, a "free rider" faces the danger of being excluded, "ostracized," from the system of cooperation, which is on the whole beneficial to him. People not only keep a very watchful eye for "cheaters" and "defectors," but in comparison with other animal species, they also have very long memories. They would help other people on the assumption that they would get similar help in return, but are likely to cease cooperating if the expected return fails to arrive. This is the basis for the so-called "reciprocal altruism" in human relations, which explains most of human seeming altruism towards non-kin (Trivers 1971; Alexander 1987; Frank 1988; Ridley 1996). The regional group is small enough to have dense kinship networks, as well as for all its members to know one another, to be in contact with them, and to hold them to account.

Thirdly, apart from biology, humans have culture, and are differentiated by their cultures. This is a human universal that set humans far apart from other animals. As culture, particularly among hunter-gatherers, was local and thus closely correlated with kinship, cultural identity became a strong predictor of kinship (Irwin 1987, p 131–156). Moreover, culture sharing is also crucial for human social cooperation. Cooperation is dramatically more effective when cultural codes, above all language, are shared (Silk and Boyd, this volume). Like genes, culture changes over time, only much faster. In Australia, for example, where the time depth of the Aboriginal population measures in tens of thousands of years, lingual diversity among the hundreds of regional groups or "dialect tribes" was great. There were more than 200 different languages and even more dialects (Lounados 1997, p 38). The tribal groupings, differing from their neighbors in their language and customs, were thus the most effective frameworks of social cooperation for their members. Outside them, people would find themselves in a great disadvantage. Therefore, shared culture in a world of cultural diversity further increases the stake

of a regional group's members in their group's survival. This factor may not have been sufficiently recognized in the literature. The regional group is bound together by mutually reinforcing and overlapping ties of kinship, social cooperation, and cultural distinctiveness. Hence, the phenomenon of "ethnocentrism," a human universal that started at the level of the hunter-gatherer regional group and would be expanded onto larger ethnic groupings later in history.

Fourthly, there is the contentious issue of group selection. Modern evolutionary theory centers on individual or gene survival, with cooperation explained by the principles of "kin selection" and "reciprocal altruism." However, according to an older view, first raised as a possibility by Darwin and now affecting a comeback, biological selection takes place not only at the individual or gene level but also among groups. A group which is biologically endowed with greater solidarity and with individual willingness to sacrifice for the group would defeat less cohesive groups. In rejection of this view, it used to be claimed that genes for self-sacrifice on behalf of the group would have the effect of annihilating those who possessed them much faster than aiding them through improved group survival, and that "cheaters" would proliferate. However, a modulated multilevel selection, working through the individual, family, and larger group levels, is supported by mathematical modeling (Hamilton 1975; Levitt 1980; Wilson and Sober 1994, 1998; Hamilton 1996; Wilson and Wilson 2007).

As can be inferred from Bowles (2006), one should guard against a sharp *empirical* distinction between kin selection and group selection. For in reality, throughout the vast majority of human evolutionary history, groups were anyhow small kin-groups. The extended family group of a few dozens, the basic human group, consisted of close kin. Even the regional group of a few hundreds consisted of medium-range kin criss-crossed by marriage ties. Truly large societies of non- (or remote-) kin emerged only very recently, with agriculture and civilization.

9.10 Conclusion: Fighting in the Evolutionary State of Nature

The hunter-gatherer way of life covers 99.5% of the history of the genus *Homo*, and more than 90% of the history of the species *H. sapiens*. Agriculture and the state are recent cultural inventions, starting in the most pioneering groups of our species only some 10,000 and 5,000 years ago, respectively, and having little effect on the human genome. Thus, to speak in a meaningful manner about human nature is to address human adaptations to the human natural habitats, which are responsible for the human biological inheritance.

Conflict and fighting in the human state of nature, as in the state of nature in general, were fundamentally caused by competition. While violence is evoked and suppressed by powerful emotional stimuli, it is not a primary, "irresistible" drive; it is a highly tuned, both innate and optional, evolution-shaped tactic, turned on and off in response to changes in the calculus of survival and reproduction. It can be

activated by competition over scarce resources, as scarcity and competition are the norm in nature because of the tendency of organisms to propagate rapidly when resources are abundant. Deadly violence is also regularly activated in competition over women, directly as well as indirectly, when men compete over resources in order to be able to afford more women and children.

From these primary somatic and reproductive aims, other, proximate and derivative, “second-level,” aims arise. The social arbiters within the group can use their position to reap somatic and reproductive advantages and hence the competition for – and conflict over – esteem, prestige, power, and leadership, as proximate goods. There are highly complex interactions at work here, which are, however, underpinned by a simple evolutionary rationale. An offense or injury will often prompt retaliation, lest it persists and turns into a pattern of victimization. Tit-for-tat may end in victory or a compromise, but it may also escalate, developing into a self-perpetuating cycle of strikes and counter-strikes, with the antagonists locked in conflict in a sort of prisoner’s dilemma situation.

Similarly, in a state of potential conflict, security precautions are called for, which may take on defensive but also offensive or preemptive character. The security dilemma variant of the prisoner’s dilemma breeds arms races that may produce an advantage to one side but often merely produces a “Red Queen” effect, by which both sides escalate their resource investment only to find themselves in the same position *vis-à-vis* one another. Organisms can cooperate, compete, or fight to maximize their survival and reproduction. Sometimes, fighting is the most promising choice for at least one of the sides. At other times, however, fighting, while being their rational choice, is not their best one.

Competition and conflict are, thus, “real” in the sense that they arise from genuine scarcities among evolution-shaped self-propagating organisms and can end in vital gains for one and losses for the other. At the same time, they are often also “inflated,” self-perpetuated, and mutually damaging, because of the logic imposed on the antagonists by the conflict itself in an anarchic, unregulated environment. In a way, this justifies both of the prevalent polarized attitudes to war: the one that sees it as a serious business for serious aims and the other that is shocked by its absurdity.

Finally, a few comments on the evolutionary perspective that underpins this study. As our grand scientific theory for understanding nature, evolutionary theory does not compete with scholarly constructs such as psychoanalytic theories in explaining motivation; rather, evolutionary theory may encompass some of their main insights within a comprehensive interpretative framework. For instance, Freud, Jung, and Adler were divided over the elementary drive which each posited as the underlying regulating principle for understanding human behavior. These were respectively: sex; creativeness and the quest for meaning; and the craving for superiority. All these drives, in fact, come together and interact within the framework of evolutionary theory, which also explains their otherwise mysterious origin. Evolutionary theory explains how long-cited motives for fighting – like William Graham Sumner’s (1968: 212) hunger, love, vanity, and fear of superior powers – came into being and how they hang together and interconnect.

Some readers may wonder why evolutionary theory should be presented here as different from and superior to other scholarly approaches. Indeed, it is because evolutionary theory is nature's *immanent* principle rather than an artificial analytical construct. It is the only nontranscendent mechanism for explaining life's complex design. This mechanism is blind natural selection in which at every stage those who are endowed with the most suitable qualities for surviving and reproducing survive. There is no reason for their survival other than that they proved successful in the struggle for survival. "Success" is not defined by any transcendent measurement but by the immanent logic of the evolutionary process.

This brings us to another widespread cause of resistance to "sociobiology," the belief that it upholds biological determinism in a subject which is distinctively determined by human culture. For once humans developed agriculture, they set in motion a continuous chain of developments that have taken us far away from our evolutionary natural way of life. Original, evolution-shaped, innate human wants, desires, and proximate behavioral and emotional mechanisms now express themselves in radically altered, "artificial" conditions. In the process, they have been greatly modified, assuming novel and diverse appearances. At the same time, however, cultural evolution has not operated on a "clean slate," nor has it been capable of producing simply "anything." Its multifarious and diverse forms have been built on a clearly recognizable deep core of innate human propensities. It has been working on a human physiological and psychological "landscape" deeply grooved by long-evolved inborn predispositions. Cultural takeoff took place much too recently to affect the human genome in any significant way (except for some well known aspects such as genes for lactose absorption, disease resistance, and a few other cases of strong selection) (Cavalli-Sforza and Feldman 1981; Lumsden and Wilson 1981; Boyd and Richerson 1985; Durham 1991; Richerson and Boyd 2005). Genetically, we are virtually the same people as our Stone Age forefathers and are endowed with the same predispositions. With cultural evolution, all bets are not off – they are merely hedged.

Unfortunately, space is too limited for a discussion of how the motives for human fighting and fighting itself have endured, and how they have been affected, by cultural evolution, through history. Interested readers are referred to my book (Gat 2006, Chaps. 12 and 17).

References

- Alexander R (1987) *The biology of moral systems*. Aldine de Gruyter, New York
 Ardrey R (1966) *The territorial imperative*. Atheneum, New York
 Aureli F, Cozzolino R, Cordischi C, Scucchi S (1992) Kin-oriented redirection among Japanese macaques: an expression of a revenge system? *Anim Behav* 44:283–291
 Axelrod R (1984) *The evolution of cooperation*. Basic Books, New York
 Balikci A (1970) *The Netsilik eskimo*. Natural History Press, Garden City, NY
 Berndt RM, Berndt CH (1964) *The world of the first Australians*. Angus & Robertson, London

- Betzig LL, Denton RK, Rodseth L (1991) Comments on Bruce Knauft, violence and sociality in human evolution. *Curr Anthropol* 32:391–428
- Bowker J (1995) *Is god a virus: genes, culture and religion*. SPCK, London
- Bowles S (2006) Group competition, reproductive leveling, and the evolution of human altruism. *Science* 314:1569–1572
- Boyd R, Richerson PJ (1985) *Culture and the evolutionary process*. University of Chicago Press, Chicago
- Boyer P (2001) *Religion explained: the evolutionary origins of religious thought*. Basic Books, New York
- Burch ES (1974) Eskimo warfare in Northwest Alaska. *Anthropol Pap Univ Alaska* 16:1–14
- Burch ES, Correll TC (1972) Alliance and conflict: inter-regional relations in North Alaska. In: Guemple DL (ed) *Alliance in eskimo society*. University of Washington, Seattle, pp 17–39
- Burton J (1990) *Conflict: human needs theory*. Macmillan, London
- Buss D, Malamuth N (1996) *Sex, power, conflict: evolutionary and feminist perspectives*. Oxford University Press, New York
- Cavalli-Sforza LL, Feldman MW (1981) *Cultural transmission and evolution: a quantitative approach*. Princeton University Press, Princeton
- Chagnon NA (1977) *Yanomamo: the fierce people*, 2nd edn. Holt, New York
- Chagnon NA (1979) Is reproductive success equal in egalitarian societies? In: Chagnon N, Irons W (eds) *Evolutionary biology and human social behavior: an anthropological perspective*. Duxbury, North Scituate, MA, pp 385–401
- Daly M, Wilson M (1983) *Sex, evolution, and behavior*. Willard Grant, Boston, MA
- Daly M, Wilson M (1988) *Homicide*. Aldine de Gruyter, New York
- Darwin C [1871] (1962) *The origin of the species and the descent of man*. The Modern Library, New York
- Dawkins R (2006) *The god delusion*. Houghton Mifflin, Boston, MA
- Dawkins R [1976] (1989) *The selfish gene*. Oxford University Press, Oxford
- de Waal FBM (1996) *Good natured: the origins of right and wrong in humans and other animals*. Harvard University Press, Cambridge, MA
- Diamond J (1992) *The rise and fall of the third chimpanzee*. Vintage, London
- Dickemann M (1979) Female infanticide, reproductive strategies, and social stratification: a preliminary model. In: Chagnon N, Irons W (eds) *Evolutionary biology and human social behavior*. Duxbury, North Scituate, MA, pp 321–367
- Divale WT, Harris M (1976) Population, warfare and the male supremacist complex. *Am Anthropol* 78:521–538
- Donald L (1997) *Aboriginal slavery on the Northwest Coast of North America*. University of California Press, Berkeley
- Drucker P (1951) *The Northern and Central Nootkan tribes*. Smithsonian, Washington, DC
- Drucker P (1965) *Cultures of the North Pacific Coast*. Chandler, San Francisco
- Durham WH (1976) Resource competition and human aggression. Part I: a review of primitive war. *Q Rev Biol* 51:385–415
- Durham WH (1991) *Coevolution: genes, culture, and human diversity*. Stanford University Press, Stanford
- Durkheim E (1965) *The elementary forms of religious life*. Free Press, New York
- Dyson-Hudson R, Smith EA (1978) Human territoriality: an ecological reassessment. *Am Anthropol* 80:21–41
- Ember CR, Ember M (1992) Resource unpredictability, mistrust, and war: a cross-cultural study. *J Conflict Resolut* 36:242–262
- Fagan R (1981) *Animal play behavior*. Oxford University Press, New York
- Ferguson RB (1995) *Yanomami warfare*. School of American Research, Santa Fe, NM
- Ferguson RB (2000) The causes and origins of 'primitive warfare': on evolved motivations for war. *Anthropol Q* 73:159–164
- Frank R (1988) *Passions within reason: the strategic role of the emotions*. Norton, New York

- Gat A (1999) The pattern of fighting in simple, small scale, pre-state societies. *J Anthropol Res* 55:563–583
- Gat A (2000) Reply to Ferguson. *Anthropol Q* 73:165–168
- Gat A (2006) War in human civilization. Oxford University Press, Oxford
- Hamilton WD (1975) Innate social aptitude of man: an approach from evolutionary genetics. In: Fox R (ed) *Biosocial anthropology*. Wiley, New York, pp 133–153
- Hamilton WD (1996) *Narrow roads of gene land*. WH Freeman, Oxford
- Hart CWM, Pilling AR (1964) *The Tiwi of North Australia*. Holt, Rinehart & Winston, New York
- Hayden B (1994) Competition, labor, and complex hunter-gatherers. In: Burch ES, Ellanna LJ (eds) *Key issues in hunter-gatherer research*. Berg, Oxford, pp 223–239
- Hayden B (2003) *Shamanism, sorcerers and saints: a prehistory of religion*. Smithsonian, Washington, DC
- Herz JH (1950) Idealist internationalism and the security dilemma. *World Polit* 2:157–180
- Huntingford F, Turner A (1987) *Animal conflict*. Chapman, London
- Irwin CJ (1987) A study in the evolution of ethnocentrism. In: Reynolds V, Falger VSE, Vine I (eds) *The sociobiology of ethnocentrism*. Croom Helm, London, pp 131–156
- Irwin CJ (1990) The inuit and the evolution of limited group conflict. In: van der Dennen JMG, Falger VSE (eds) *Sociobiology and conflict*. Chapman, London, pp 189–226
- Jervis R (1978) Cooperation under the security dilemma. *World Polit* 30:167–214
- Jones S (1993) *The language of the genes*. Anchor Books, New York
- Keeley LH (1996) *War before civilization*. Oxford University Press, New York
- Keen I (1982) How some murngin men marry ten wives: the marital implications of matrilineal cross-cousin structures. *Man* 17:620–642
- Keen I (1988) Yolngu religious property. In: Ingold T, Riches D, Woodburn J (eds) *Hunter and gatherers*. Berg, New York and Oxford, pp 272–307
- Krause A (1970) *The Tlingit Indians*. University of Washington, Seattle
- LeBlanc SA, Register KE (2003) *Constant battles: the myth of the peaceful noble savage*. St Martin, New York
- Levitt PR (1980) *The genetics of altruism*. Academic, New York
- Long J (1970) Polygyny, acculturation and contact: aspects of aboriginal marriage in Central Australia. In: Berndt RM (ed) *Australian aboriginal anthropology*. University of Western Australia Press, Nedland, pp 292–304
- Lorenz K (1966) *On aggression*. Methuen, London
- Lournados H (1988) Palaeopolitics: resource intensification in aboriginal Australia and Papua New Guinea. In: Ingold T, Riches D, Woodburn J (eds) *Hunter and gatherers, vol I, History, evolution and social change*. Berg, New York, pp 148–160
- Lournados H (1997) *Continent of hunter-gatherers: new perspectives in Australian prehistory*. Cambridge University Press, Cambridge
- Low DS (1979) Sexual selection and human ornamentation. In: Chagnon NA, Irons W (eds) *Evolutionary biology and human social behavior: an anthropological perspective*. Duxbury, North Scituate, MA, pp 462–487
- Lumsden CJ, Wilson EO (1981) *Genes, mind, and culture*. Harvard University Press, Cambridge, MA
- Maslow AH (1970) *Motivation and personality*. Harper, New York
- Meggitt MJ (1965a) Marriage among the Walbiri of Central Australia: a statistical examination. In: Berndt RM, Berndt CH (eds) *Aboriginal man in Australia*. Angus & Robertson, Sydney, pp 146–159
- Meggitt MJ (1965b) *Desert people: a study of the Walbiri Aborigines of Central Australia*. University of Chicago, Chicago
- Mueller CW (1983) Environmental stressors and aggressive behavior. In: Geen RG, Donnerstein EI (eds) *Aggression: theoretical and empirical reviews, vol 2*. Academic, New York, pp 51–76
- Oswalt WH (1967) *Alaskan eskimos*. Chandler, Washington, DC

- Richerson PJ, Boyd R (2005) *Not by genes alone: how culture transformed human evolution*. University of Chicago Press, Chicago
- Ridley M (1994) *The red queen: sex and the evolution of human nature*. Macmillan, New York
- Ridley M (1996) *The origins of virtue: human instincts and the evolution of cooperation*. Viking, New York
- Rosman A, Rubel P (1971) *Feasting with mine enemy: rank and exchange among northwest coast societies*. Columbia University Press, New York
- Silverman I (1987) Inclusive fitness and ethnocentrism. In: Reynolds V, Falger V, Vine I (eds) *The sociobiology of ethnocentrism*. Croom Helm, London, pp 112–117
- Smith PK (1984) *Play in animals and humans*. Blackwell, Oxford
- Sumner WG (1968) *War*, reprinted from his *war and other essays* (1911). In: Bramson L, Goethals G (eds) *War: studies from psychology, sociology, anthropology*. Basic Books, New York, pp 205–227
- Symons R (1979) *The evolution of human sexuality*. Oxford University Press, New York
- Tinbergen N (1968) On war and peace in animals and man. *Science* 160:1411–1418
- Trivers RL (1971) The evolution of reciprocal altruism. *Q Rev Biol* 46:35–57
- Wilson DS (2002) *Darwin's cathedral: evolution, religion, and the nature of society*. University of Chicago, Chicago
- Wilson DS, Sober E (1994) Reintroducing group selection to the human behavioral sciences. *Behav Brain Sci* 17:585–654
- Wilson DS, Sober E (1998) *Unto others: the evolution and psychology of unselfish behavior*. Harvard University Press, Cambridge, MA
- Wilson DS, Wilson EO (2007) Rethinking the theoretical foundations of sociobiology. *Q Rev Biol* 82:327–348