

# (Evolutionary) Theories of Warfare in Preindustrial (Foraging) Societies

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*Submitted:* September 19, 2002

*Accepted:* October 15, 2002

*Key words:* **war causation; evolution; 'primitive' warfare; (pitched) battle; lethal male raiding; kin selection; sexual selection**

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Neuroendocrinology Letters 2002; 23(Suppl.4):55-65 pii: NEL231002R06 Copyright © Neuroendocrinology Letters www.nel.edu

## **Abstract**

I present an inventory of theories of war causation (and on the origin of war) in preindustrial (traditional, foraging, 'primitive', hunter-gatherer, band- and tribe-level) societies, with emphasis on the roles of natural selection, sexual selection and kin selection. Also the school of sociocultural evolution is briefly discussed.

Many anthropologists do not acknowledge a (bio)evolutionary background to war, adhering to Mead's [1] famous dictum 'War is only a cultural invention' (e.g., Harris [2 to 10], Ferguson [11 to 20], Keeley [21]). Many students of war do not consider an evolutionary approach useful or relevant, even though the prevailing cultural-materialist theory is highly compatible with the evolutionary paradigm (Sanderson [22]).

A variety of scholars associate the origin of war with the Mesolithic way of life. Ferguson [17] is the most outspoken advocate of this position: "In sum, the evidence is fully consistent with the conclusion that war first became a social institution in Mesopotamia some 8,000 years ago, and has been reinvented in many times and places since, and flatly inconsistent with the idea that war has been a regular occurrence throughout human history".

In its most general terms, the rationale of warfare, genocide, and other forms of collective violence may be epitomized as 'getting rid of the competition' or eliminating the sources of fear and terror. "War is obviously one way of gaining access to needed resources - and of eliminating potential threats to your own population or resources" (Corning [23]).

Natural selection does not, of course, favor destructiveness as such, but reproductive success; violent interactions, including warfare, make evolutionary sense only if they serve reproduction (Meyer [24] to [27]), Low [28, 29], Van der Dennen [30]).

A great number of disciplines have traditionally studied war in contemporary as well as ‘primitive’ or preliterate, preindustrial, nonstate, band-level and tribal (hunter-gatherer and horticulturalist) societies, but always with the implicit assumption that war was (a) uniquely human, and (b) a one-time cultural invention spread by diffusion, or a number or series of independent inventions (e.g., Cioffi-Revilla [31]).

The discovery of male coalitional aggression and ‘lethal male raiding’ in free-ranging chimpanzees (Goodall [32], Manson & Wrangham [33], Wrangham [34], Wrangham & Peterson [35]) and battle-type intergroup violence in social carnivores and a great number of primates (Cheney [36], van der Dennen [30]) makes the conventional view of warfare as a singularly human ‘cultural invention’ of some few thousand years old increasingly untenable. Instead, a view of phylogenetic continuity, as first proposed by Darwin [37], Bigelow ([38], [39]), Corning [23, 40, 41] among others, and elaborated by many others (Meyer [24] to [27]), Low [28, 29], Slurink [42], van Hooff [43], van der Dennen ([30], [44] to [49]), Gat ([50] to [52]) is worth exploring.

Phylogeny refers to the ‘ultimate’ dimension of causality: “Why has warfare, or propensities for warfare, evolved in the first place?” and “Why has warfare evolved in only so few species?”; which should be distinguished from the proximate causative factors, e.g., “What are the motives or conditions that led to this particular war?”. Ultimate and proximate causes are complementary rather than mutually exclusive.

The evolutionary (or selectionist or Darwinian) paradigm proceeds from the assumption that all organisms, including Man (*Homo sapiens sapiens*), have evolved; that all living organisms descend from other organisms that successfully mated and reproduced in past environments, and that – ultimately – all organisms have come in one uninterrupted chain from the first simple multiplying cells, and thus are phylogenetically related to one another. Ultimately, all organisms are the products of the former strategies of their genes.

### **Darwinian (bio)evolution: natural selection, sexual selection and kin selection**

In general, two types of warfare (broadly defined as organized intergroup or intercommunity contest competition) in animals and man have been distinguished: Raiding (‘lethal male raiding’ or ambush or dawn surprise attack), and battle (confrontation of two opposing lines or phalanxes). When a battle is prearranged it is called a ‘pitched battle’. In ‘primitive’ societies raiding is the most bloody and lethal form of warfare due to small but rapidly accumulating casualties, and occa-

sional near-genocidal routing (e.g., Davie [53], Turney-High [54], Divale [55], Cheney [36], Bigelow ([38], [39]), Manson & Wrangham [33], Low ([28], [29]), van der Dennen [30], Keeley [21], Gat [50], Wrangham [34], Wrangham & Peterson [35], Otterbein [56]).

Lethal male raiding has been explained by Wrangham’s ‘imbalance-of-power’ hypothesis, Tooby & Cosmides’ [57] ‘risk-contract’ theory (see also Malagon-Fajar [58]), and Low’s [28, 29] and van der Dennen’s [30] sexual selection approach (*vide infra*). Wrangham [34] has also suggested the distinct possibility that the chimpanzee-hominid common ancestor already had this lethal male raiding pattern in its behavioral repertoire (panid-hominid synapomorphy) some 6 million years ago.

Battle-type warfare occurs in many primate species and some other group-territorial mammals, such as social carnivores. Battles result mainly from chance encounters by primate groups, failed raids or failed surprise attacks and chance encounters in ‘primitive’ peoples, and among standing armies in historical and contemporary warfare when the armies are too big to operate undetected. Turney-High [54] has illuminated the ‘biomechanics’ of the line which develops more or less automatically when two groups meet in an agonistic encounter and every individual organism strives to have its vulnerable flanks protected by its neighbors. In social carnivores and ‘female bonded’ (or female philopatric) primate species, female participation in these – more noisy than bloody – battles commonly exceeds male participation. Tournament-like ‘ritualized’ combat is generally found among ‘advanced’ tribal societies with fairly dense populations (e.g., New Guinea), and is supposed to test the (numerical) strength of the opponent while leaving room for a more peaceful solution of the conflict by mediators – but the ritual battle can easily develop into a rout and a massacre if a substantial imbalance of power is detected by one of the parties involved (Divale, Durham [59, 60], Otterbein, van der Dennen). Some Australian tribes practiced so-called ‘expiatory combats’ (comparable to medieval duels) for settling disputes (van der Dennen [61]).

The contention that war must have existed before mankind is based on (a) the Phylogenetic Continuity argument (Bigelow, Low, van der Dennen, Otterbein, Wrangham): continuity between humans and non-human primates, as opposed to the mostly implicit assumption of Man’s uniqueness and the conviction that war is a one-time cultural invention; (b) the Multimale (or Polyadic) Coalition argument: as soon as a species has solved the problem of coordinated cooperative action by more than two individuals, it has solved the problem of warfare because this kind of ‘selfish cooperation’ (Corning) is an excellent instrument for escalated and violent intercoalition and intergroup contest competition. “Cooperation-for-conflict has probably always been the key to human survival” as Bigelow put it. Until now, at least two (brainy) species have accomplished this: Man (*Homo s. sapiens*) and the common chimpanzee (*Pan troglodytes*); male bottle-nosed dolphins (*Tursiops truncatus*), who are capable of ‘super-

coalitions' for the purpose of forcefully monopolizing females, are a serious third candidate. Additionally, some ethnocentric xenophobia between groups would be selectively favored in a potentially hostile and violently competitive environment (e.g., Bigelow, van den Berghe [62], Reynolds, Falger & Vine [63], van der Dennen, Shaw & Wong [64], Hamilton [65 to 67], Irwin [68], Wilson [69, 70]), exacerbated by the sharply decreasing (genetic) kinship at the groups' boundaries: "At the boundary of the local group, there is usually a sharp drop in relatedness; this drop may be such as to promote active hostility between neighbouring groups" (Hamilton [67]). It has been noted by many scholars that intergroup competition can be a potent and relentless selective force without high levels of violence and killing (e.g., Bigelow, Wilson). "By current theory, genocide or genosorption strongly favoring the aggressor need take place only once every few generations to direct evolution. This alone could push truly altruistic genes to a high frequency within the bands" (Wilson [69]).

The question why males are the warriors in raiding-type warfare has been addressed by Symons [71], Trivers [72], Dow [73], Tooby & Cosmides, Low, van der Dennen, Wrangham, and Ghiglieri [74 to 76], among others. Their answers are remarkably compatible: raiding-type warfare evolved as a high-risk/high-gain male-coalitional reproductive strategy (or, arguably, even as a parental investment strategy). To understand this – for some undoubtedly extravagant – claim, the following observations are relevant. Reproductive success is the only criterion in the currency of evolution. Male and female organisms have evolved different strategies for the optimalization of their reproductive success because what for the one sex is a highway to genetic immortality is for the other sex a one-way ticket to genetic oblivion (paraphrasing Symons). For male organisms females are generally the limiting resource: for human males women are the highly strategic 'good' (always in short supply) that can convert the other resources controlled by the males into offspring (Borgia [77], Melotti ([78] to [81]), Symons). Accordingly, among chimpanzees (a male philopatric species), the ultimate benefit of lethal male raiding has been hypothesized to be increased access by raiding males to reproductively valuable females, via either incorporation of neighboring females or encroachment on the territory of neighboring groups and elimination of numerically weaker males.

Wrangham [34] presents the principal adaptive hypothesis for explaining the species distribution of intergroup coalitional killing. This is the imbalance-of-power hypothesis, which suggests that coalitional killing is the expression of a drive for dominance over neighbors. Two conditions are proposed to be both necessary and sufficient to account for coalitional killing of neighbors: (1) a state of intergroup hostility; (2) sufficient imbalances of power between parties that one party can attack the other with impunity. Under these conditions, it is suggested, selection favors the tendency to hunt and kill rivals when the costs are suf-

ficiently low. Given the chimpanzee evidence, Manson & Wrangham proposed that such imbalance-of-power mechanism must have been an important factor favoring the evolution of lethal male violence in humans also – and even before the evolution of weapons. This strategy may be a pattern common to the chimpanzee-bonobo-human (or HUCHIBO) clade: "Unlike gorillas and orangutans, males of the chimpanzee-bonobo-human clade retain their male offspring predominantly, live in closed social groups containing multiple females, mate polygynously, restrict their ranging to a communal territory, are cooperatively active in territorial defence, and, apparently, when a neighbouring community weakens, the males of some communities make a concerted strategic effort to stalk, attack, and kill their rivals as do men" (Ghiglieri [74]), although in the bonobo (*Pan paniscus*) some intergroup agonistic behavior but no lethal raiding (nor communal hunting) has been observed. Especially, the combination of male-male cooperation, 'proto-ethnocentrism', group-territoriality and female transfer has been singled out as the starting condition for lethal intergroup violence (Goodall, Ghiglieri, Alexander [82 to 90], Manson & Wrangham, Slurink, Van der Dennen, Wrangham & Peterson, Wrangham). Wrangham & Peterson note that the underlying psychology of 'male bonding' is no different for chimpanzee raiding parties, human urban gangs, pre-state warrior societies, and contemporary armies.

Tooby & Cosmides enumerate some significant implications of their Risk Contract of War: (1) men, but not women, will have evolved psychological mechanisms ('Darwinian algorithms'), designed for coalitional warfare; and (2) sexual access to women will be the primary benefit that men gain from joining male coalitions. Or, in Low's words: "Through evolutionary history, men have been able to gain reproductively by warring behavior; women have almost never been able to do so" (Low [28]).

This contrasts, as we have seen, with most other primate (and social carnivore) species in which the females have more 'vested interests' in the defense of their lineage and the integrity of their group territory.

The rationale for groups to compete *as groups* has been illuminated by Pitt [91], McEachron & Baer [91] and Baer & McEachron [92]. Several scenarios can be pictured in intergroup contest competition: (a) peaceful coexistence or merging of the groups; (b) peaceful competition between groups with the losers starving; (c) violent conflict between individuals; (d) scramble competition; and (e) violent group conflict, i.e., warfare. Warfare would be the best alternative for the group that practiced it successfully, assuming it to have been within their biological reach. If conflict is inevitable, it makes better evolutionary sense for the troops to determine ownership of the resources *as groups*, rather than having both conflict and decreased inclusive fitness (which would accompany a merger). Assuming that different groups tended towards one or another of these strategies, in varying degrees, it is easy to see that the warprone group would be the most successful, and



could indeed overrun any group attempting to practice one of the other strategies. Plainly, it will be the war-mongers whose genes are represented in the next generation. Indeed, the only possible competitive strategy for survival in competition with a group practicing warfare, is warfare itself, either defensive or offensive.

Richerson [94] advances what he calls the 'evolutionary tragedy' hypothesis: Warfare is liable to evolve even if it makes everybody worse off. It is the perversion of the situation (the logic of the war 'game') rather than that of the actors involved.

Humans thus became quintessentially first-strike creatures. Unlike other animal species, they were able to kill adult conspecifics by surprise, when their adversaries were unarmed and vulnerable, and from a substantial distance by throwing projectiles (Pitt, Baer & McEachron, Bingham [95], Gat).

Most of the many factors that favor the reproductive potential of cooperative people and good warriors can be grouped under two categories: (1) the genetic effects of increased *Lebensraum* (territory and resources) and (2) the genetic effects of polygyny (Bigelow, Hamilton, Wilson, Low, van der Dennen).

Among many hunting-gathering peoples a man's quality as a warrior and his hunting prowess is directly related to the number of wives he can obtain, and/or his access to nubile women (e.g., Symons, Chagnon, Low, Hawkes [102], van der Dennen).

Van der Dennen's investigation of the evolutionary origins of intergroup conflict in social carnivores and primates identified (a) the capability to form polyadic coalitions (selfish and opportunistic cooperation with more than one conspecific) as the necessary precondition, which in turn required (b) sociality (intergroup conflict will occur only in long-lived social species: Low [28]); (c) Machiavellian (opportunistic) intelligence; and (d) proto-ethnocentrism. Proto-ethnocentrism is supposed to imply some kind of group identity, that is, the ability to recognize ingroup versus outgroup members, to discriminate between these categories, and to preferentially treat ingroup members to positive reciprocal (altruistic) interactions such as protection, nepotism, and sharing of resources. Van der Dennen's evolutionary scenario or 'evolutionario' also outlines the phylogenetic and socio-ecological principles governing group formation, ingroup altruism, outgroup antagonism, and intergroup agonistic behavior (i.e., war and its non-human equivalent).

### **Sociocultural evolution: stages in sociopolitical complexity**

The basic motives and practices of 'primitive' war were already known to the classical historians such as Herodotus and Tacitus (Turney-High, van der Dennen). One of the first accounts in Europe of 'primitive' cannibalism and warfare was Hans Staden's [103] story of his life among the Brazilian Tupinamba (though some doubt has risen about its authenticity).

In 1767 Adam Ferguson [104] published *An Essay on the History of Civil Society* (the first attempt at an

empirical cross-cultural study), in which he concluded: "We had occasion to observe that in every rude state the great business is war; and that in barbarous times, mankind, being generally divided into smaller parties, are engaged in almost perpetual hostilities". War, intergroup antagonism, "has been the great business of mankind since time immemorial". This conclusion neatly confirmed Hobbes' [105] gloomy view of the war-ridden condition of primitive society (the causes of which he identified as "competition, diffidence, and glory"). Diametrically opposed views were espoused by Rousseau [106] in his *Le Contrat Social*, in which he introduced the concept of the 'Noble Savage' who did not wage war simply because there were no (material) benefits to be gained by waging war (This so-called Hobbes-Rousseau controversy, a persistent and irreconcilable one, has dominated the anthropological literature until today).

The concept of evolution as an ordering principle in cultural anthropology was proposed about 1840, even before Darwin's *Origin of Species* [107]. But this referred to (Lamarckian, Spencerian) sociocultural evolution, not to Darwinian (bio)evolution, which Darwin himself liked to call "descent with modification". (The terms 'evolution', 'function', and 'adaptation' are used by both bio-evolutionists and sociocultural evolutionists, but these refer to altogether different phenomena and may cause considerable confusion).

Evolutionism, the predominant school to the end of the 19th century, assumed a linear and progressive conception of evolution and history: human societies advance from the simple to the complex, from the 'savage' primitive horde, through a barbarian stage, to civilization (Spencer [108], Morgan [109], Tylor [110]; Steward [111] and some others saw in cultural evolution a multilineal phenomenon). A century later Sahlins [112 to 115] and Service [116 to 118] proposed a scheme of social evolution in four stages: the band, the tribe, the chiefdom, and the state, with concomitant changes in warfare patterns and motives (from what Muehlmann [119] and Meyer called endemic feuds and wars of retaliation to war as an instrument of predation and plunder, territorial expansion, conquest, subjugation and genocide).

Also Fried [120 to 122] and Hunter & Whitten [123] identified four stages or levels of 'sociopolitical' evolution: egalitarian society, rank society, stratified society, and state-level society (more or less equivalent with the band, tribe, chiefdom and state stages). This sequence is assumed to represent a cultural-evolutionary development. The nature of warfare as it is conducted at each of these levels appears to differ in a systematic way. Similarly, Quincy Wright [124] distinguished social, economic, and political warfare as distinct progressive social-evolutionary stages.

To these levels of sociopolitical organization correspond the levels of military organization as distinguished by Feest [125]: (a) War-chiefs on the basis of reputation; (b) Dual leadership: formal peace- and war-chiefs; (c) Hereditary chiefs and primordial warrior society; (d) Full-blown military societies (or fraterni-

ties); and finally (e) Standing armies (see also Andreski [126], [127]).

Carneiro [128 to 131] noted that whereas small-scale band-level and tribal societies are usually capable of putting together warrior bands of a few dozen at most, chiefdoms can put together fighting forces in the hundreds or thousands. Carneiro studied chiefdom-level warfare in the Cauca Valley of Colombia and in Fiji. He notes that warfare among chiefdoms in these regions was nearly constant. Fiji was seldom without war, and in the Cauca Valley "warfare was universal, acute, and unending" [131], a perpetual struggle for territory and power. This is *a fortiori* the case of states and empires; it has been observed time and again that states make war and war makes states. The formation of the state in codified history represents a remarkable process of parallel evolution, beginning in Mesopotamia around 5,100 years ago (Sanderson [22]). "Conquerors have usually been very generous with their genes. Also, they have frequently killed off or enslaved the males of their vanquished opponents and preempted the women" (Corning [40]).

Hobhouse, Wheeler & Ginsburg [132], van der Bij [133], and Quincy Wright were the first to apply crude statistics to their cross-cultural sample of some 650 distinctive 'primitive' societies, as well as distinguishing levels of 'economic culture', i.e., lower and higher hunters, lower, middle, and higher agriculturists, and lower and higher pastorals. Wright concluded that 95% of his sample were warlike peoples (which seems to confirm the notion of universal belligerence). Other important conclusions were: "Neither territorial conquest, nor seizure of slaves nor plunder of economic goods is characteristic of primitive warfare" and "the more primitive the people the less warlike it tends to be". The absence of 'economic' motives in the warfare patterns of primitive societies (at least the hunter-gatherers) was also emphasized by Turney-High, who thought that primitive warfare was so desultory because it was so thoroughly uneconomic. Few primitive societies had reached what he called the 'military horizon'.

Quite a different tradition was started by Steinmetz [134, 135] (who retorted to van der Bij's finding that primitive peoples are unwarlike by stating that primitive peoples are primitive precisely *because* they are unwarlike) and especially Davie [53] who emphasized sanguinary war for plunder, territorial conquest, abduction of women, etc., although also acknowledging 'non-economic' motives such as revenge, the obligations of the blood feud and other 'magico-religious' motives (cf. Ferguson [11, 13]).

The contemporary schools of (multi)functionalism and (eco)materialism (Vayda [136 to 143], Leeds [144], Harris, Ferguson) also postulate realistic group conflict about material interests; warfare is depicted as a strategy to secure scarce, vital or strategic resources such as land and game (high-quality protein). The roots of the materialist school sprouted in the 1940s when a number of anthropologists reinterpreted Plains Indian, Iroquoian, and Zulu warfare in thoroughly economic

terms, i.e., as conscious, deliberate and violent struggles over material resources.

Revenge, women, territory, and scarce resources (including the never-ending search for security) are the main proximate causes or motives of war and feuding in 'primitive' societies reported in the literature, closely followed by status, prestige and glory, and supernatural or magico-religious motives (such as headhunting, trophy taking, scalping, cannibalism, human sacrifice, placating ancestral spirits, etc.) (Davie, Turney-High, Chagnon, Divale, Otterbein, Ferguson, van der Dennen, Keeley, Gat). As Gat reasoned: "The interconnected competition over resources, status and prestige, 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".

In a 1978 paper Carol Ember [145] (definitively?) shattered "the myth about peaceful hunter-gatherers". Van der Dennen, Keeley, and Gat could confirm recently that 'primitive' warfare (among hunter-gatherers, horticulturalists, simple agriculturalists) and prehistoric warfare is generally a lethal, bloody, and sometimes even genocidal business: *guerre à l'outrance* (due to rapidly accumulating casualties in raiding and routing). Group extinctions due to chronic warfare between (horticultural) village communities are quite common in New Guinea, Amazonia, and other regions where feuds and wars are endemic.

Broch & Galtung [146] reanalyzed Wright's data by multivariate analysis techniques, and found quite unambiguously that "belligerence is a concomitant of civilization". Though their data are synchronic rather than diachronic, they strongly suggest that there is a process involved, in the sense that increasing civilization would lead to increasing warlikeness or bellicosity.

A concomitant (mainly social-Darwinist) theory in this connection is the view that struggle, war and intergroup conflict have been the principal factors of human progress, or that war is the prime mover of human (cultural, moral, spiritual) evolution: the Agent of Progress.

Among contemporary scholars, the role played by war in the creation of more complex societies is divided between those who see it as a prime mover (e.g., Carneiro), as secondary and only reinforcing other trends (e.g., Fried), or as one of a set of interacting variables (e.g., Ferguson).

See Table I for the main theories of 'primitive' war.

The evolution of historical war may be succinctly described as the transformation of armed men into manned arms, while the reproductive rewards have become increasingly 'unhooked' from the warring behavior, as Low suggested.

Turney-High repeatedly emphasized that the evolution of warfare is not simply a matter of (weapons) technology, but one of social organization. "The military horizon depends, then, not upon the adequacy

**Table I: Theories of 'primitive' warfare**

The main theories of 'primitive' warfare can be categorized (more or less arbitrarily and overlapping) as follows:

**(1) Warfare as cultural invention and macroparasitism.** This is the prevailing paradigm among cultural anthropologists, sociologists, and macrohistorians. 'Warfare is only a cultural invention' (Mead [1]) and 'War is not in our genes' are the best known adages of this inventionist (Boasian) school which begins with Boas [149] and his students Dewey [150], Benedict [151] and Mead. Warfare as one-time invention (or series of inventions, and spread mainly by cultural diffusion), and warfare as plunder written-large concomitant with the rise of the first states and empires some 5,000 years ago are the common themes in all general history textbooks: e.g., McNeill [152], Boulding [153], Leakey & Lewin [154], Schneider ([155] to [157]), White [158], Bronowski [159], Starr [160], Dyer [161], Dawson [162] Cioffi-Revilla, Wittfogel [163], the diffusionists, and the Marxist-Leninists.

**(2) (Eco)materialist and related (multi)functionalist theories.** Most or all theorists of these school acknowledge sociocultural evolution but do not see any special role for 'biology' (which is usually conceived of as 'genes and hormones', without taking the ultimate dimension into consideration), and thus (bio)evolution is commonly rejected as irrelevant (e.g., Ferguson, Keeley). A great number of these theorists are true heirs of Malthus in emphasizing the demographic factor (overpopulation, population pressure in relation to ecological and/or climate changes) in the causation of war: Sumner [164], [165] Sumner & Keller [166], Davie, Bernard, Andreski, Bouthoul, Lathrap [167], Steward, Harris, Ferguson, Keeley. (Multi)functionalists are Vayda, Leeds [168], Vayda & Leeds, Leeds and Vayda [169]. A typical proposition of this school is: "Primitive warfare arose as part of a complex system that prevented human populations from exceeding the carrying capacity of their habitats" (Harris, [3]), or in Vayda's terminology: War functions to adjust the man/land ratio. Multifunctionalists envisage not only the adjustment of the man/land ratio due to warfare, but also the regulation of psychological, economic, and sociopolitical variables. The most caustic, and sarcastic, critic of this school is Hallpike [170]. One offshoot of this school tries to relate population regulation, preferential female infanticide, warfare, and the so-called 'male supremacist complex' (Harris, Divale [171], [172], Divale & Harris [173], [174], Divale *et al.* [175]).

**(3) Sociocultural selection and evolution of warfare theories** (Evolutionism for short). A typical proposition of this school is: As societies compete, "the less well adapted tend to fall by the wayside, leaving outstanding those best able to withstand the competition" (Carneiro, [129]): White [158], Malinowski [176], Turney-High, Otterbein ([177] to [181]), Meyer, Muehlmann, Fried, Hunter & Whitten, Feest, Andreski, Steward, Naroll & Divale [182], Sahlins, Service, Knauft ([183] to [185]), Boehm [186], among others. White (cf. Newcomb [187]) claimed that "Warfare is a struggle between social organisms, not individuals. Its explanation is therefore social or cultural, not psychological". This programmatic and dogmatic rigor has done more harm than good (e.g., Chagnon, [101]). General criticisms by Hallpike and Robarchek [188], [189]. Most students of this school adhere to the band, tribe, chiefdom, state sequence of sociocultural stages (see text). Muehlmann and others (e.g., Kelly [190]) proposed that war probably originated in and evolved from the blood feud. Meyer envisaged a sociocultural development from endemic war (for metaphysical power) to its instrumentalization (for material power). Meyer and Wilson regard warfare as well as ethnocentrism as cultural hypertrophifications of biological predispositions. Lopreato's [191] 'biocultural' approach roots war and general human nastiness in evolved behavioral predispositions of self-enhancement. These last approaches form a transition to the (bio)evolutionary theories.

**(4) (Bio)evolutionary theories.** This body of theories is predicated upon the assumption of phylogenetic continuity, and gene-culture co-evolutionary or 'dual inheritance' models, meaning that both our biological and sociocultural evolution are acknowledged. These theorists are a heterogeneous lot, ranging from strictly genic selectionists (Durham) to group selectionists, with sexual selectionists and kin selectionists somewhere in between. Intimate relationships have been proposed between

- ◆ Warfare and group territoriality: Tinbergen [192], [193], Holsti [194], Davie, Pitt, Turney-High, Bigelow, Alcock [195]. Hamilton and Wilson envisaged a 'stepping stone' model of territorial aggrandizement and genosorption.
- ◆ Warfare and hunting (or 'Carnivorous Psychology') theories: James [196], [197], Frobenius [198], Washburn & Lancaster [199], Lee & DeVore [200], Corning, Pfeiffer [201], Melotti, van Hooff. War as (evolved from the) man hunt: Frobenius; 'Killer Ape' popularizations: Dart [202], [203], Ardrey [204]; and related early 'Instinct of Pugnacity' formulations by James and McDougall [205]. Scott [206] proposed that early hominids did not evolve as formidable hunters and warriors but as timid scavengers and 'fear biters'. The masculine 'hunting mystique' has lost much of its appeal lately.
- ◆ Warfare and human (ultra)sociality and balance-of-power theorists (human groups as predators upon one another, after the rise of human groups to ecological dominance): Alexander, Andreski, Lorenz [207], Slurink, van der Dennen. "Fear of hostile foreigners has probably always been the most effective promotor of social unity among related bands of people" (Bigelow, [38]).
- ◆ Warfare and hominid/human brain evolution (trebling of human brain due to relentless groups competition): Darwin, Keith [208], Bigelow, Pitt, Alexander, Alexander & Tinkle, Baer & McEachron, McEachron & Baer.
- ◆ Warfare and group selection (during specifically *human* evolution, human groups have continuously replaced, incorporated, subjugated, or eliminated other human groups): Darwin, Bigelow, Corning, Masters [209], Wilson, Eibl-Eibesfeldt ([210] to [214]), Alexander, Melotti, Boyd & Richerson [215], Richerson & Boyd [216]. Eibl-Eibesfeldt particularly emphasizes the role of indoctrination in creating the 'warrior-type' personality.
- ◆ Warfare and kin selection (ethnocentrism-cum-xenophobia): van den Berghe, Goodall, Shaw & Wong, Wilson, Lumsden & Wilson [217], [218], Meyer, Reynolds *et al.*, Falger [219], van der Dennen, Thienpont & Cliquet [220].
- ◆ Warfare and sexual selection (sexual – or reproductive – competition and the evolution of a 'male coalitional psychology'; war for women); Chagnon, Tooby & Cosmides, Low, van der Dennen, Alexander, Borgia, Symons, Tiger [221], [222], Tiger & Fox [223], Trivers, Wilson, Gat (Goldstein [224] discusses 'War and Gender' without invoking the evolutionary dimension; cf. Adams [225], Ehrenreich [226], Kroeber & Fontana [227]). The warrior-type personality may be viewed as a product of sexual selection. Goodall, Ghiglieri, Manson & Wrangham, van der Dennen, Wrangham, Wrangham & Peterson have taken chimpanzee 'lethal male raiding' into account in explaining human raiding. "Group aggression confers such a huge winning edge against single competitors that, once it entered the arms race of sexual selection, kin selection instantly forged it into the most serious weapon in any male's behavioral arsenal" (Ghiglieri [76]).



of weapons but the adequacy of team work, organization, and command working along certain simple [tactical] principles". Thus armies have been characterized by increasing hierarchization of command structure, fighting phalanx-type battles of ever increasing size, and campaigns for plunder, territorial aggrandizement, and political subordination: power, supremacy, and empire.

Discipline and coordination in battle provide the watershed between warrior and soldier. The psychology of the warrior gave way in western history when warfare changed from guerrilla-like raids and ambushes to massive battle formations: "The first phalanx might have comprised a small elite group of fighting men and assured these specialists in warfare of success in the works of Ares. But the phalanx implies a radical transformation of the warrior ethos: Collective discipline takes the place of individual exploits and *sophrosune*, self-discipline takes the place of *menos*, the state of warrior frenzy" (Vernant [147]). But if contemporary terrorism, guerrilla warfare, warlordism and 'low-level conflict' would prove to be indeed the threats they are said to constitute since World War II, and especially since September 11, 2001, then we may be going 'back to the future'.

War has become an increasingly maladaptive and cost/benefit suboptimal solution to political problems, but will in this century probably be waged for scarce resources, particularly sweet water, oil, 'security' and 'ethnic nationalism' (secessionist, irredentist and ethnopolitical wars are, and probably will be, mainly intranational).

Thus, the means of production, the means of reproduction, and the means of destruction have largely shaped, and will continue to shape human sociocultural evolution (Schmookler [148], Ehrenreich, Sanderson).

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