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Zoon Politicon: The Evolutionary Roots of Human Sociopolitical Systems

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Abstract

Our primate ancestors evolved a complex sociopolitical order based on a social dominance hierarchy in multi-male/multi-female groups. The emergence of bipedalism and cooperative breeding in the hominin line, together with environmental developments which made a diet of meat from large animals fitness enhancing, as well as cultural innovation in the form of fire and cooking, created a niche for hominins in which there was a high return to coordinated, cooperative scavenging or hunting of large mammals. This, in turn, led to the use of stones and spears as lethal weapons.

The availability of lethal weapons in early hominin society undermined the standard social dominance hierarchy of multi-male/multi-female primates. The successful sociopolitical structure that replaced the ancestral social dominance hierarchy was a political system in which success depended on the ability of leaders to persuade and motivate. This system persisted until cultural changes in the Holocene fostered the accumulation of material wealth, through which it became possible once again to sustain a social dominance hierarchy, because elites could now surround themselves with male relatives and paid protectors.

This scenario suggests that humans are predisposed to seek dominance when this is not excessively costly, but also to form coalitions to depose pretenders to power. Much of human political history is the working out of these oppositional forces.

Self-Interest and Cultural Hegemony Models of Political Power

For half a century following the end of World War II, the behavioral sciences were dominated by two highly contrasting models of human political behavior. In biology, political science, and economics, a *self-interest* model held sway, wherein individuals are rational self-regarding maximizers. In sociology, social psychology, and anthropology, by contrast, a *cultural hegemony* model was generally accepted. In this model, individuals are the passive internalizers of the culture in which they operate. The dominant culture, in turn, supplies the norms and values associated with role-performance, so individual behavior meets the requirements of the various roles individuals are called upon to play in daily life (Durkheim 1933/1902; Parsons 1967; Mead 1963).

Contemporary research has been kind to neither model. There has always been an undercurrent of objection to the cultural hegemony model, which Dennis Wrong (1961) aptly called the "oversocialized conception of man." Behavioral ecology alternatives were offered by Konrad Lorenz (1963), Robert Ardrey (1966/1997) and Desmond Morris (1999/1967), a line of thought that culminated in Edward O. Wilson's *Sociobiology: The New Synthesis* (1975), the resurrection of human nature in Donald Brown's *Human Universals* (1991), and Leda Cosmides and John Tooby's withering attack in *The Adapted Mind* on the so-called "standard social science model" of cultural hegemony (Barkow et al. 1992). Meanwhile, the analytical foundations of an alternative model, that of *gene–culture coevolution* (see below), were laid by C. J. Lumsden and Edward O. Wilson (1981), Luca Cavalli-Sforza and Marcus Feldman (1973, 1981), and Robert Boyd and Peter Richerson (1985).

In opposition to cultural hegemony theory, daily life provides countless examples of the fragility of dominant cultures. African-Americans in the era of the civil rights movement, for instance, rejected a powerful ideology that justifyied segregation, American women in the 1960s rejected a deep-rooted patriarchal culture, and gay Americans rejected traditional Judeo-Christian treatments of homosexuality. In succeeding years, each of these minority countercultures was largely accepted by the American public. In the Soviet Union, Communist leaders attempted to forge a dominant culture of socialist morality by subjecting two generations of citizens to rigid and intensive indoctrination. This failed to take hold and, following the fall of the USSR, was rejected whole cloth, without the need for extensive counter-indoctrination. Similar examples could be given from the political experience of many other countries, possibly all.

Undermining the self-interest model began with the ultimatum game experiments of Güth et al. (1982), Roth et al. (1991), and many others. These experiments showed that human subjects may reject positive offers in an anonymous one-shot money-sharing situation if they find the split to be unfair. The experiments of Fehr and Gächter (2000, 2002) showed that cooperation could be sustained in a finitely repeated public goods game if the punishing of free riders is permitted, despite the fact that the self-interest model predicts no cooperation. These and related findings have led in recent years to a revision of the received wisdom in biology and economics toward the appreciation of the central importance of other-regarding preferences and character virtues in biological and economic theory (Gintis et al. 2005; Henrich et al. 2005; Okasha and Binmore 2012)

The untenability of the self-interest model of human action is also clear from everyday experience. Political activity in modern societies provides unambiguous evidence. In large democratic elections, the rational self-regarding agent will not vote because the costs of voting are positive and significant, but the probability that one vote will alter the outcome of the election is vanishingly small. Thus the personal gain from voting is vanishingly small. For similar reasons, if one chooses to vote, there is no plausible reason to vote on the basis of the impact of the outcome of the election on one's self-regarding gains. It follows also that the voter, if rational, self-regarding, and incapable of personally influencing the opinions of more than a few others, will not bother to form opinions on political issues, because these opinions cannot affect the outcome of elections. Yet people do vote, and many do expend time and energy in forming political opinions. This behavior does not conform to the self-interest model.

It is a short step from the irrefutable logic of self-regarding political behavior that rational self-regarding individuals will not participate in the sort of collective actions that are responsible for growth in the world of representative and democratic governance, the respect for civil liberties, the rights of minorities and women in public life, and the like. In the self-interest model, only small groups of individuals aspiring to social dominance will act politically. Yet modern egalitarian political institutions are the result of such collective actions (Bowles and Gintis 1986; Giugni et al. 1998). This behavior cannot be explained by the self-interest model.

Apart from professional politicians and socially influential individuals, electoral politics is a vast morality play in which models of the rational self-regarding actor are not only a poor fit, but are conceptually bizarre. It took Mancur Olson's *The Logic of Collective Action* (1965) to make this clear to many behavioral scientists, because virtually all students of social life had assumed, without reflection, the faulty logic that rational self-regarding individuals will vote, and will "vote their interests" (Downs 1957).

Defenders of the self-interest model may respond that voters *believe* their votes make a difference, however untenable this belief might be under logical scrutiny. Indeed, when asked why they vote, voters' common response is that they are trying to help get one or another party elected to office. When apprised of the illogical character of that response, the common reply is that there are in fact close elections, where the balance is tipped in one direction or another by only a few hundred votes. When confronted with the fact that one vote will not affect even such close elections, the common repost is that "Well, if everyone thought like that, we couldn't run a democracy."

Politically active and informed citizens appear to operate on the principle that voting is both a duty and prerogative of citizenship, an altruistic act that is justified by the categorical imperative: act in conformance with the morally correct behavior for individuals in one's position, without regard to personal costs and benefits. Such mental reasoning, which has been called "shared intentionality," is implicated in many uniquely human cognitive characteristics, including cumulative culture and language (Sugden 2003; Bacharach 2006). Shared intentionality rests on a fundamentally prosocial disposition (Gilbert 1987; Bratman 1993; Tomasello and Carpenter 2007; Hrdy 2009).

Human beings acting in the public sphere are, then, neither docile internalizers of dominant culture nor sociopathic personal gain maximizers. Rather, they are generally what Aristotle called *zoon politikon*—political beings (Aristotle 350 BC/2002). In this chapter we lay out a rather general framework for understanding this deep property of the human psyche, drawing in various ways on all the behavioral sciences. This framework will be used to elucidate the role of basic human political predispositions in creating and transforming sociopolitical structures.

The Political and Economic Structure of Primate Societies

Humans are one of more than two hundred extant species belonging to the Primate order. All primates have sociopolitical systems for regulating social life within their communities. Understanding human sociopolitical organization involves specifying how and why humans are similar to and different from other primate species. Similarities likely indicate that the trait was already present before humans evolved. For instance, many primate species, including humans, seek to dominate others and are adept at forming coalitions. It is thus likely that their common ancestor also possessed these traits. Dominance seeking and coalition formation in humans, then, are not purely cultural. Rather, humans are endowed with the genetic prerequisites for dominance striving and coalition formation.

On the other hand, although chimpanzees engage in warlike raids where larger parties target and kill much smaller ones, no nonhuman primate species engages in human-style war, with large numbers of individuals on either side of a conflict. Because hunter-gatherer societies do engage in such war, the presumption is that this predisposition is uniquely human and perhaps purely cultural, or derived from more basic genetic predispositions, which themselves may be the response to prior cultural changes, of which insider favoritism may be an example (Otterbein 2004; Bowles 2006, 2007; Bowles and Gintis 2011).

Using this logic, we can examine the social structure of multi-male/multi-female monkey and ape societies (de Waal 1997b; Maestripieri 2007) to identify the elements of human sociopolitical organization that were likely present among the first hominins. The focus here is on males because in human politics, historically, men were the main players. We ask about leadership, dominance, and alliances.

Primates live in groups to reduce the risk of predation (Alexander 1974; van Schaik 1983), to facilitate the exchange of information as to food location (Eisenberg et al. 1972; Clutton-Brock 1974), and to defend food sources against competing groups (Wrangham 1980). However, these benefits largely arise through mutualism or as byproducts of grouping. Thus these groups rarely if ever engage in organized collective action. As a result, the primate form of group living has only limited need for leaders (i.e., individuals instrumental in initiating and coordinating group-level action). Instead, individuals vary in dominance based on pure physical prowess.

In most primate species, both sexes form dominance hierarchies, in which more dominant individuals gain privileged access to food or mates, and tend to have higher fitness as a result (Vigilant et al. 2001; Maestripieri 2007; Majolo et al. 2012). In many primate species, dominant females depend on alliances to maintain their position; for males the same is true in only a handful of primate species, including chimpanzees. Thus dominants rarely perform any group-level beneficial acts. A rare exception includes males displaying toward predators, a behavior seen in a variety of primate species.

Chimpanzees are an archetypical species when it comes to reconstructing the origins of the human political system. Dominant male chimpanzees provide little leadership, and they provide virtually no parenting. In many primate species, dominant males have sufficiently high paternity certainty to induce them to provide protection to infants (Paul et al. 2000), but in chimpanzees, paternity concentration is so low (Boesch et al. 2006; Vigilant et al. 2001), most likely because chimpanzee females are scattered and cannot easily be located at all times, that males tend to ignore rearing the young. The only clear service they provide to the group is that they keep the peace by intervening in disputes (de Waal 1997b; Rudolf von Rohr et al. 2012). In short, the political structure of the chimpanzee society, like that of primates generally, is largely a system for funneling fitness-enhancing resources to the apex of a social dominance hierarchy based on physical prowess and coalition-building talent. This holds basically for the bonobo as well, where monopolization of matings by particular males is even lower.

Chimpanzee males rely on coalitions and alliances more than males in most other primate species. Their coalitions come in two major categories: rank-changing and leveling coalitions (Pandit and van Schaik 2003; van Schaik et al. 2006). At the top of the hierarchy, males often rely on a supporter to acquire and maintain top dominance (Goodall 1964; Nishida and Hosaka 1996; de Waal 1998). Because this implies that the top male does not necessarily have the highest individual fighting ability, he relies on the presence of an ally, and frequently depends on coalitions to protect his position (de Waal 1998; Boesch et al. 1998). In addition, multiple lower-ranking males may form coalitions to keep the top male(s) from taking too big a share of the resources. These coalitions do not change the dominance ranks of the participants, but intimidate the dominants into limiting damaging actions aimed at subordinates. Females similarly form such leveling coalitions to counter the arbitrary power of dominant males, especially in captivity (Goodall 1986). This pattern of political power based on the hierarchical dominance of the physically powerful along with a system of sophisticated political alliances to preserve or to limit the power of the alpha male (Boehm and Flack 2010) is carried over, yet fundamentally transformed, in human society (Knauft 1991; Boehm 1999, 2011).

This data on nonhuman primates, in general, and chimpanzees and other multi-male/multi-female species, in particular, is rather surprising and very important. It is surprising because, Aristotle notwithstanding, political theorists have widely assumed that political structure involves purely cultural evolution, whereas the primate data show roots to political behavior going back millions of years. The result is important because it lays the basis for an evolutionary analysis of human political systems. Such an analysis promises to elucidate the role of basic human political predispositions in reinforcing and undermining distinct sorts of human sociopolitical structures.

The Evolutionary Trajectory of Primate Societies

It would be useful if we could read past social structure from the historical record, but we cannot. The fossil record provides the most concrete answers to our evolutionary history, but is highly incomplete. There are, for instance, skeletal records of only about 500 individuals from our hominin past. Moreover, behavior does not fossilize and social structure, up until the past few thousand years, has not left direct marks in the earth. Thus we must investigate the relationship between genetic relatedness and phenotypic social organization from living primate species.

The hominin lineage branched off from the primate main stem some 6.5 million years ago. The watershed event in the hominin line was the emergence of bipedalism. Bipedalism is well developed in *Australopithecus afarensis*, which appeared three million years after the origin of the hominin lineage. *Homo ergaster* (2.0–1.3 MYA) or *H. erectus* (1.9 MYA–143,000 years ago) was the first currently documented obligate biped, having a relatively short arm:leg ratio.

Bipedalism in hominins was critically dependent upon the prior adaptation of the primate upper torso to life in the trees. The Miocene Hominoid apes were not true quadrupeds; they had specialized shoulder and arm muscles for swinging and climbing, as well as a specialized hand structure for grasping branches and manipulating leaves, insects, and fruit. When the hominin line was freed from the exigencies of arborial life, the locomotor function of the upper limbs was reduced so that they could be reorganized for manipulative and projectile control purposes. Both a more efficient form of bipedalism and the further transformation of the arm, hand, and upper torso became possible.

Nonhominin primate species are capable of walking on hind legs, but only with difficulty and for short periods of time. Chimpanzees, for instance, cannot straighten their legs, and require constant muscular exertion to support the body. Moreover, the center of gravity of the chimpanzee body must shift with each step, leading to a pronounced lumbering motion with significant side-to-side momentum shifts (O'Neil 2012). The hominin pelvis was shortened from top to bottom and rendered bowl-shaped to facilitate terrestrial locomotion without sideward movement, the hominin leg bones became sturdy, the leg muscles were strengthened to permit running, and the development of arches in the feet facilitated a low-impact transfer of weight from leg to leg. Thus, bipedality facilitates running efficiently for great distances, although not approaching the speed of many large four-footed mammals.

Today we celebrate obligate bipedality as the basis for human upper-body physical and psychomotor capacities for crafting tools and handicrafts. However, another major contribution of these capacities was for fashioning lethal weapons.

Control of Fire: A Precondition of Social Sharing Norms

The hominin control of fire cannot be accurately dated. We have firm evidence from about 400,000 years ago in Europe (Roebroeks and Villa 2011) and about 800,000 years ago in Israel (Alperson-Afil 2008), but it is likely that this key event happened in Africa much earlier. The control of fire had strong effects on hominin cultural and phylogenetic evolution. First, the transition to obligate bipedality is much easier to understand if the hominins that made it had control of fire (Wrangham and Carmody 2010). Prior to the control of fire, humans almost certainly took to the trees at night, like most other primates, as a defense against predators. Because predators have an instinctive fear of fire, the control of fire permitted hominins to abandon climbing almost completely.

Second, the practice of cooking food was a related cultural innovation with broad gene–culture coevolutionary implications. Cooking presupposes a central location to which the catch is transported, and hence requires abandoning the socially uncoordinated “tolerated theft” distribution of calories typical of food sharing in nonhuman primate species, in favor of a distribution based on widely agreed-upon fairness norms (Isaac 1978b). This major sociopsychological transition was probably made possible by the adoption of some form of cooperative breeding and hunting among hominins and had begun before the origin of *H. erectus* (van Schaik and Burkart 2010). In sum, the control of fire and the practice of cooking were important preconditions for the emergence of a human moral order.

Although the archeological record does not permit accurate dating for the regular use of fire by hominins, (Sandgathe et al. 2011; Roebroeks and Villa 2011), it is clear that hominins with access to cooked food did not require the large colon characteristic of other primates. This allowed them to reduce the amount of time spent chewing food from the four to seven hours a day (characteristic of the great apes) to about one hour per day. With a smaller gut, less need for chewing, and more rapid digestion, hominins were liberated to develop their aerobic capacity and perfect their running ability (Wrangham and Carmody 2010).

From Gatherer to Scavenger

Beginning around 2.5 MYA there was a major forking in the evolutionary path of our ancestors. The Australopithecines branched in at least two very different evolutionary directions: one led to the robust Australopithecines and a genetic dead end by about 1.4 MYA; the other, eventually, to the first humans.

It is likely that these diverging evolutionary paths were the response to novel environmental challenges. Coinciding with this hominin divergence was a shift in the global climate to frequently fluctuating climatic conditions. Early hominins succeeded by learning to exploit the increased climate instability (Potts 1996; Richerson et al. 2001; O'Connell et al. 2002).[1] The resulting adaptations enhanced hominin cognitive and sociostructural versatility. "Early bipedality, stone transport,...encephalization, and enhanced cognitive and social functioning," Potts (1998:93) argues, "all may reflect adaptations to environmental novelty and highly varying selective contexts." This view is supported by the observation that greater encephalization occurred as well in many mammalian lineages (Jerison 1973).

Eating the meat of large animals provided a niche for emerging hominins quite distinct from that of other primates and thus selected for the traits that most distinguish humans from apes. This much was clear to Darwin in *The Descent of Man* (1871). However, until recently, most paleoanthropologists assumed that meat was acquired through hunting from the australopithicine outset (Dart 1925; Lee and DeVore 1968). In fact, it now appears that early hominins, in the transition from the Pliocene to the Pleistocene, were more likely scavenger-gatherers than hunter-gatherers, of which there is firm evidence dating from 1.6 to 1.8 MYA.

The first proponents of early hominins as scavengers believed that the scavenging was "passive," in that small groups of hominins took possession of carcasses only after other predators, upon being sated, abandoned their prey (Blumenschine et al. 1994). More recent evidence, however, suggests the prevalence of "competitive scavenging," in which organized groups of humans supplied with primitive weapons, chased the killers and appropriated carcasses in relatively intact shape (Dominguez-Rodrigoa and Barba 2006). The implicit argument is that the hominin lethal weapons of the period were sufficient to drive off other predators, and hence presumably to drive off live prey as well. To cripple or kill a large prey item, however, requires considerably more

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[1] deMenocal (2011) notes that Darwin (1859) long ago speculated on the role of climate change in human evolution, as did Dart (1925), and that modern findings support the importance of climate-based selection pressures (Vrba 1995; Potts 1998), and specifically, climate variability. Examining the environmental records of several hominin localities, Potts (1998) found that habitat-specific hypotheses are disconfirmed by the evidence; however, the variability selection hypothesis, which states that large disparities in environmental conditions were responsible for important episodes of adaptive evolution, was widely supported.

powerful weapons. Thus, before poisoned, stone-tipped spears and arrows, the hunting of large prey was likely unrewarding (but see Liebenberg 2006).

Flaked stone tool making, butchering large animals, and expanded cranial capacity all appear around 2.5 MYA, but there is no evidence that Australopithecenes hunted large game. *Australopithecus* and *H. habilis* were in fact quite small: adult males weighed under 100 pounds and females about 75 pounds. Their tools were primitive, consisting of stone scrapers and rough hammerstones. They therefore lacked the sophisticated weapons for hunting large and swift-moving prey. They are unlikely to have hunted effectively, but they could well have scavenged. Modern chimpanzees and baboons are known to scavenge the kills of cheetahs and leopards, so this behavior was likely in the repertoire of the earliest hominins. With highly cooperative and carefully coordinated maneuvers, they could have chased even ferocious predators.

Hunting and scavenging small animals is not cost effective for large primates, while scavenging large animals requires group participation and efficiently coordinated cooperation, both in organizing an attack on predators feeding on a large prey and in protecting against predators while processing and consuming the carcass (Isaac 1978a). Moreover, the only known weapons that might be used to scare off hunters and scavengers and potential predators were stones of the appropriate size and weight to be thrown at high velocity (Isaac 1987). Such stones had to be carefully amassed in strategic sites within a large scavenging area, so that when a scouting party located an appropriate food object, it could call others to haul the stones to the site of the dead animal, as a strategic operation preceding the appropriation of the animal carcass. These were the first lethal projectile weapons.

This scenario is supported by that fact that the fossils of large animals that have bone markings, indicating hominin flaying and scraping with flaked stone tools, are often found with stones that originated several kilometers away. Contemporary chimpanzees carry stones to nut-bearing trees and use them to crack the nuts, so this behavior was likely available to Australopithecenes. Chimpanzees, however, carry stones only several hundred meters at most, while *H. habilis* scavengers carried stones as far as ten kilometers. By contrast, neither the Oldowan tools of the period nor the later and more sophisticated Acheulean tools, found from the early Pleistocene up to about 200,000 years ago, show any sign of being useful as hunting weapons, although besides stones, scavengers of 500,000 years ago probably had sharpened and fire-hardened spears to ward off competitive scavengers and threatening predators, at least after the domestication of fire (Thieme 1997). By contrast, nonhuman primates use tools, but they do not use weapons to battle (McGrew 2004), although chimpanzees have been seen using spears fashioned from nearby tree branches to kill bushbabies that they discovered in tree hollows (Pruetz and Bertolani 2007).

The emergence of lethal weapons, however primitive, was likely key to the evolution of hominid social organization. Bingham (1999) and Boyd et al.

(2010) stress the importance of the superior physical and psychomotor capacities of humans in clubbing and throwing projectiles as compared with other primates, citing Goodall (1964) and Plooij (1978) on the relative advantage of humans. Darlington (1975), Fifer (1987), and Isaac (1987) document the importance of these traits in human evolution. Bingham (1999) stresses that humans developed the ability to carry out collective punishment against norm violators, thus radically lowering the cost of punishing transgressors. Calvin (1983) argues that humans are unique in possessing the neural machinery for rapid manual-brachial movements that both allows for precision stone throwing and lays the basis for the development of language, which like accurate throwing depends on the brain's capacity to orchestrate a series of rapidly changing muscle movements. These changes took place, in all likelihood, more than 700,000 years ago.[2]

Social Hierarchy: Dominance and Reverse Dominance

Hunter-gatherer societies have been classified into *immediate-return* and *delayed-return* systems. (Woodburn 1982). In the former, group members obtain direct return from their labor in hunting and gathering, with food lasting at most a few days. The tools and weapons they use are highly portable. In delayed-return societies, individuals hold rights over valuable assets, such as means of production (e.g., boats, nets, beehives), processed and stored food and materials, and herds of animals. In these societies we find forms of social stratification akin to those in modern societies: social dominance hierarchies in the form of lineages, clans, chiefdoms, and the like. The fossil record suggests, however, that the delayed-return human society is a quite recent innovation, appearing some 10,000 years ago, although on ecologically suitable locations, it may have existed earlier—most of these locations are now below sea level. *H. sapiens* thus evolved predominantly in the context of immediate-return systems.

The issue in "delayed return" is not the capacity for delayed gratification or long-range planning, but rather the availability of accumulated wealth. Material wealth allows aspirants to positions of social dominance to control enough allies and resources to offset the capacity of subordinate individuals to disable and kill them. As long as the material gains from a position of social dominance exceed the cost of coalition building and paying guard labor, social dominance of the sort common in other primate societies can be reestablished

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[2] Fossil evidence indicates that hominins developed speech on the order of 1 MYA. The hyoid bone is a key element of speech production in humans. Martinez et al. (2008) show that hominin hyoid bones from 540,000 years ago are similar, and hence were inherited from their last common ancestor, Homo rhodesiensis, around 700,000 to 1,000,000 years ago. Using evidence from the acoustical properties of Middle Pleistocene fossil remains of the hominin inner ear, Martinez et al. (2004) argue that hominins of this period had auditory capacities similar to those of living humans.

in human society.[3] To avoid confusion, we will refer to societies that lack forms of material wealth accumulation as *simple*, rather than delayed-return, hunter-gatherer societies.

Simple hunter-gatherer societies, Woodburn (1982:434) suggests, are "profoundly egalitarian...[they] systematically eliminate distinctions...of wealth, of power and of status." Fried (1967), Service (1975), Knauft (1991), and others likewise comment on the egalitarian character of simple hunter-gatherer societies. What factors are responsible for such unusual egalitarianism? Here, we argue that it is due to the combination of interdependence and ability to punish transgressors.

Cut marks on bones suggest that big-game hunting started only 250,000 years ago, and delegating sharing to a single cutter began 200,000 years ago (Stiner 2002; Stiner et al. 2009). However, cut marks on bones may not be a reliable indicator of how meat is shared (Lupo and O'Connell 2002). Indeed, if Wrangham and Carmody (2010) are correct in dating the control of fire by hominins and the cooking of meat, the problem of the fair distribution of meat among families must have been solved much earlier, and doubtless was a major source of egalitarian sentiment, as well as providing the material substrate for the development of a social morality. Certainly contemporary hunter-gatherer societies are often violent, competitive, and there is considerable political inequality (Potts 1996), but they almost always distribute large game peacefully, based on a commonly accepted set of fairness principles (Kaplan and Hill 1985b; Kelly 1995).

The human ecological niche requires food sharing on a daily basis as well as on a longer-term basis due to the occasional injuries or illnesses to which even the best hunters or gatherers may be subjected (Sugiyama and Chacon 2000; Hill et al. 2011). Thus each individual forager, especially in the immediate-return form of foraging, is utterly dependent on the others in their camp, band, or even wider sharing unit. This strong interdependence dampens the tendency to free ride on others' efforts and favors strong individual tendencies toward egalitarianism, as well as sophisticated fairness norms concerning the division of the spoils (Whallon 1989; Kaplan and Hill 1985a).

Collective hunting in other species does not require a fairness ethic because participants in the kill simply eat what they can secure from the carcass. However, the practice of bringing the kill to a central site for cooking, which became characteristic of hominin societies, is not compatible with uncoordinated sharing and eating. In the words of Winterhalder and Smith (1992:60):

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[3] In fact, the appearance of farming and private property in land led to high levels of political inequality in only a few societies, and states with a monopoly in coercive power emerged only after a millennium of settled agriculture. Nor were early farming societies more economically stratified than hunter-gatherer societies (Borgerhoff Mulder et al. 2009). The accumulation of material wealth is thus merely a precondition for the reestablishment of social dominance hierarchies.

> [O]nly with the evolution of reciprocity or exchange-based food transfers did it become economical for individual hunters to target large game. The effective value of a large mammal to a lone forager...probably was not great enough to justify the cost of attempting to pursue and capture it....However, once effective systems of reciprocity or exchange augment the effective value of very large packages to the hunter, such prey items would be more likely to enter the optimal diet.

Fire and cooking, therefore, are cultural preconditions to the emergence of a normative order and social organization based on normative behavior.

The second element is that egalitarianism is imposed by the community, creating what Boehm (1999) calls a *reverse dominance hierarchy*. Hunter-gatherers share with other primates the striving for hierarchical power, but social dominance aspirations are successfully countered because individuals do not accept being controlled by an alpha male and are extremely sensitive to attempts of group members to accumulate power through coercion. When an individual appears to be stepping out of line by threatening or killing group members, he will be warned and punished. If this behavior continues and he cannot be ostracized, the group will delegate one or more members, usually including at least one close relative of the offender, to kill him. Boehm's message in *Hierarchy in the Forest* is that "egalitarianism involves a very special type of hierarchy, a curious type that is based on *anti*hierarchical feelings" (Boehm 1999:10).

Because of the extremely long period during which humans evolved without the capacity to accumulate wealth, we have become constitutionally predisposed to exhibit these antihierarchical feelings. Of course, in modern societies, there is still enough willingness to bend to authority in humans to ensure that social dominance hierarchy remains a constant threat and often a reality.

Capable leadership in the absence of a social dominance hierarchy in these societies is doubtless of critical importance to their success, and leaders are granted by their superior position, and through the support of their followers, with fitness and material benefits. Leadership, however, is based not on physical prowess, but rather on the capacity to motivate and persuade.[4]

The centrality of reverse dominance hierarchy is assessed in *Moral Origins: the Evolution of Virtue, Altruism, and Shame* (Boehm 2011). Boehm located 339 detailed ethnographic studies of hunter-gatherers, 150 of which are simple hunter-gatherer societies, and coded fifty of these societies from around the world. He calls these simple hunter-gatherer societies "Late Pleistocene Appropriators" (LPAs). Despite the fact that these societies have faced highly variable ecological conditions, Boehm finds that their social organization follows the pattern suggested by Woodburn (1982) and Boehm (1999). Not only

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[4] This account of the growth of intelligence sharply contrasts the Machiavellian intelligence doctrine (Jolly 1972; Humphrey 1976; Byrne and Whiten 1988), according to which encephalization was the product of an arms race in which the gains from intellect were enhanced ability to deceive others and detect deception.

do LPAs exhibit reverse dominance hierarchy, they also subscribe to a common human social morality, operating through internalized norms, so that individuals act prosocially because they value moral behavior for its own sake and would feel guilty behaving otherwise.[5]

How do we explain this unique pattern of sociopolitical organization? Woodburn attributes this to our access to and presence of lethal weapons, which neutralize a social dominance hierarchy based on coercion. "Hunting weapons are lethal," he writes, "not just for game animals but also for people. Effective protection against ambush is impossible...with such lethal weapons." Woodburn adds that under "normal circumstances the possession by all men, however physically weak, cowardly, unskilled or socially inept, of the means to kill secretly anyone perceived as a threat to their own well-being...acts directly as a powerful leveling mechanism. Inequalities of wealth, power and prestige...can be dangerous for holders where means of effective protection are lacking" (Woodburn 1982:436).

Boehm (2011) argues that LPAs inherited from our ancient hunter-gatherer forbears the capacity to control free riders through collective policing, using gossip and informal meetings as the method of collecting information concerning the behavior of group members. Moreover, according to our best evidence, the hunter-gatherer societies that defined human existence until some 10,000 years ago also were involved in widespread communal and cooperative child rearing (Hrdy 2000, 2009) and hunting (Boehm 1999; Bowles and Gintis 2011; Boyd and Silk 2002; Boehm 2011), thus tightening the bonds of sociality in the human group and increasing the social costs of free-riding behavior.

Nonhuman primates never developed weapons capable of controlling a dominant male. Even when sound asleep, an accosted male chimpanzee reacts to hostile onslaughts by awakening and engaging in a physical battle, basically unharmed by surprise attack. In *Demonic Males*, Wrangham and Peterson (1996), recount several instances where even three or four male chimpanzees viciously and relentlessly attack a male for twenty minutes without succeeding in killing him. The ineffectiveness of chimpanzees in this regard is not simply the lack of the appropriate lethal weapon, but the inability to wield effectively potentially dangerous natural objects, for instance stones and rocks. A chimpanzee may throw a rock in anger, but only weakly and rarely will it achieve its target.

The human lifestyle, unlike that of chimpanzees, requires many collective decisions, such as when and where to move camp and which alliances to

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[5] The notions of norms and norm internalization are common in sociology and social psychology but are absent from the other social science disciplines. According to the sociopsychological theory of norms, appropriate behavior in a social role is given by a social norm that specifies the duties, privileges, and expected behavior associated with the role. Adequate performance in a social role normally requires the actor to have a *personal commitment* to the role—one that cannot be captured by the self-regarding "public" payoffs associated with the role (Gintis 2009).

sustain or sever. This lifestyle thus requires a complex sociopolitical decision-making structure and a sophisticated normative order. Many researchers incorrectly equate dominance, as found among chimpanzees, with leadership. In some species, such as gorillas, dominants can indeed initiate or influence group progressions, because many rely on the dominant as the main protector and prefer his proximity. In human foragers, there are no such dominants.

Capable leadership, in the absence of a social dominance hierarchy in these societies, is nonetheless of critical importance to their success. However, leaders are granted by their superior position and with the support of their followers, fitness, and material benefits. Leadership, as we have seen, is based not on physical prowess or coercion, but rather on the capacity to motivate and persuade. Eibl-Eibesfeldt (1989) and Wiessner (2006), among many others, have stressed the importance in hominin societies of leadership based on persuasion and coalition building. Wiessner (2009:197–198) remarks: "Unlike nonhuman primates, for whom hierarchy is primarily established through physical dominance, humans achieve inequalities through such prosocial currencies as the ability to mediate or organize defense, ritual, and exchange."

It is important not to confuse reverse dominance hierarchy, which is a predisposition to reject being dominated in an authoritarian manner, with a predisposition for egalitarian outcomes. Rather, persuasion and influence become a new basis for social dominance. The Machiavellian intelligence hypothesis (Byrne and Whiten 1988) is not wrong about the role of hyper-cognition in personal success, but rather about the social basis for this success, which is exhibiting prosocial behavior that enhances the fitness of the group and its members (Clutton-Brock 2009). Wiessner (2006:198) observes that successful small-scale societies "encourage the capable to excel and achieve higher status on the condition that they continue to provide benefits to the group. In no egalitarian institutions can the capable infringe on the autonomy of others, appropriate their labor, or tell them what to do."

Are There Egalitarian Nonhuman Primates?

If there were a multi-male/multi-female primate society without a social dominance hierarchy, and in the absence of lethal weapons, this would cast doubt on the propositions offered herein. Does such a society exist? Here, an important distinction is between egalitarianism that arises due to low intensity of contest competition and egalitarianism, accompanied by high tolerance, that arises due to interdependence or some form of subordinate leverage over dominants (Sterck et al. 1997).

While there are clear behavioral patterns in nonhuman primates that serve as the basis for human reverse dominance hierarchy, all multi-male/multi-female nonhuman primate societies are in fact based on social dominance hierarchy. There may be variation in the degree to which female or male dominance relations are decided and thus their dominance hierarchies are more or less steep, depending on the strength of contest competition for resources (Sterck et al. 1997). It is often argued that bonobos (*Pan paniscus*) are more egalitarian than chimpanzees and more like humans (de Waal 1997a; Hare et al. 2007). However, except for female dominance hierarchy in feeding access for infants, the pattern of dominance in bonobos strongly resembles that of chimpanzees (Furuichi 1987, 1989, 1997). Moreover, differences in the steepness of the dominance hierarchy among males and females are not consistent across studies (Stevens et al. 2007; Jaeggi et al. 2010).

Similarly, reports indicate a rather thoroughgoing egalitarianism among woolly spider monkeys, or muriquis (Strier 1992), which also live in large multi-male/multi-female societies, much like those of bonobos and chimpanzees. They are highly promiscuous and males hardly compete for matings (Milton 1984; Strier 1987). In all the primate examples of egalitarianism in large societies (i.e., not in those forming pairs of polyandrous trios), there is a clear reduction in the intensity of male contest competition as a result of female reproductive physiology that leads to unpredictable ovulation and thus low potential monopolization of matings, and therefore paternity concentration, by top-ranking males (van Schaik et al. 2004b). Thus, egalitarian social relations are the result of scramble-like competition.

In none of these societies do we find the interdependence that we see in human societies. The closest analog are the societies of wild dogs and wolves, which are both cooperative breeders and hunters (Macdonald and Sillero-Zubiri 2004). Even there we mostly, though not always, have a single breeding pair rather than multiple cooperating pairs. We conclude that, on the basis of available evidence, there are no multi-male/multi female egalitarian primate societies except for *H. sapiens*.

Phylogenetic and Cultural Implications of Governance by Consent

Following the development of lethal weapons, successful hominin social bands came to value individuals who could command prestige by virtue of their persuasive capacities. Persuasion depends on clear logic, analytical abilities, a high degree of social cognition (knowing how to form coalitions and motivate others), and linguistic facility (Plourde 2009). Leaders with these traits could be both effective and fearsome, but one intemperate move could lead to their devolution from power. Thus in concert with the evolution of an increasingly complex feeding niche (Kaplan et al. 2000), the social structure of hunter-gatherer life was one contributing factor to the progressive encephalization and evolution of the physical and mental prerequisites of effective linguistic and facial communication. In short, two million years of evolution of hyper-cooperative multifamily groups that deployed lethal weapons gave rise to the particular cognitive and sociopolitical qualities of *H. sapiens*.

The increased cephalization in humans was an extension of a long primate evolutionary history of increased brain size, usually associated with increased cognitive demands required by larger group size (Humphrey 1976; Jolly 1972; Byrne and Whiten 1988).[6] The lethal weapon argument extends this analysis to explain human exceptionalism in the area of cognitive and linguistic development.

The role of lethal weapons in promoting egalitarian multi-male/multi-female hominin groups explains the huge cognitive and linguistic advantage of humans over other species not as some quirk of sexual selection—the favored theory of Darwin (1871), Fisher (1930), Miller (2001), and many others—but rather as directly fitness enhancing, despite the extreme energy costs of maintaining a large brain. Increased cognitive and linguistic ability entailed heightened leadership capacities, which fellow group members were very willing to trade for enhanced mating and provisioning privileges.

In a sense, hominins evolved to fill a *cognitive niche* that was relatively unexploited in the early Pleistocene (Tooby and DeVore 1987). According to Pinker (2010:8993):

> I suggest that the puzzle [of human hyper-cognition] can be resolved with two hypotheses. The first is that humans evolved to fill the "cognitive niche," a mode of survival characterized by manipulating the environment through causal reasoning and social cooperation. The second is that the psychological faculties that evolved to prosper in the cognitive niche can be coopted to abstract domains by processes of metaphorical abstraction and productive combination, both vividly manifested in human language.

Cooperative Mothering and the Evolution of Prosociality

In cooperative breeding, the care and provisioning of offspring is shared among group members. The standard estimate is that some 3% of mammals have some form of allomaternal care; in the Primate order, however, this frequency rises to 20% or more (Hrdy 2009, 2010). In many nonhuman primates and mammals in general, cooperative breeding is accompanied by generally heightened prosociality, as compared with related species with purely maternal care. The most plausible explanation is that cooperative breeding leads to a social structure that rewards prosocial behavior, which in turn leads to changes in neural structure that predisposes individuals to behaving prosocially (Burkart et al. 2009; Burkart and Van Schaik 2010). An alternative possibility is that there is some underlying factor in such species that promotes prosociality in general, of which collective breeding is one aspect.

Human prosociality was strongly heightened beyond that of other primates living in large groups, including cooperative breeders, by virtue of the niche

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[6] Group size is certainly not the whole story. Multi-male/multi-female monkey groups are often as large or larger than ape groups, although the latter have much larger brains and are considerably more intelligent. The full story concerning cephalization in mammals, in general, and primates, in particular, remains to be told (Navarrete and van Schaik 2011).

hominins occupied, involving coordination in hunting and scavenging, and sophisticated norms for sharing meat. This combination might account for the degree of cooperative breeding in the hominin line. As hominin brain size increased, the duration of immaturity did as well (Barrickman et al. 2008), and immatures had to learn an increasingly large number of foraging and other skills (Kaplan et al. 2000). Hominins evolved a unique system of intergenerational transfers that enabled the evolution of evermore complex cognitive abilities to support evermore complex subsistence skills (Kaplan et al. 2007). Our uniquely prosocial shared intentionality (Tomasello et al. 2005) can be traced back to the psychological changes involved in the evolution of cooperative breeding and hunting (Burkart et al. 2009).

Lethal Weapons and Egalitarian Political Organization from the Holocene to the Present

With the development of settled trade, agriculture, and private property some 10,000 years ago, it became possible for a Big Man to gather a relatively small group of (usually closely related) subordinates and consorts around him that would protect him from the lethal revenge of a dominated populace, whence the slow but inexorable rise of the state, both as an instrument for exploiting direct producers and for protecting them against the exploitation of external states and bands of private and state-sanctioned marauders. The hegemonic aspirations of states peaked in the thirteenth century, only to be driven back by the series of European population-decimating plagues of the fourteenth century. The period of state consolidation resumed in the fifteenth century, based on a new military technology: the use of cannons. In this case, as in some other prominent cases, technology became the handmaiden to establishing a social dominance hierarchy based on force.

In *Politics*, Book VI part vii,[7] Aristotle writes “there are four kinds of military forces—the cavalry, the heavy infantry, the light armed troops, the navy. When the country is adapted for cavalry, then a strong oligarchy is likely to be established [because] only rich men can afford to keep horses. The second form of oligarchy prevails when the country is adapted to heavy infantry; for this service is better suited to the rich than to the poor. But the light-armed and the naval elements are wholly democratic...An oligarchy which raises such a force out of the lower classes raises a power against itself.”

The use of cavalry became dominant in Western Europe during the Carolingian period. The history of warfare from the Late Middle Ages to the First World War was the saga of the gradual increase in the strategic military value of infantry armed with longbow, crossbow, hand cannon, and pike, which marked the recurring victories of the English and Swiss over French and Spanish cavalry in the twelfth to fifteenth centuries. Cavalries responded by developing

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[7] Available at: http://www.constitution.org/ari/polit_06.htm

dismounting tactics when encountering infantry, using heavy hand-held weapons, such as two-handed swords and poleaxes. These practices extended the viability of cavalry to the sixteenth century in the French and Spanish armies, but gradually through the Renaissance, and with the rise of Atlantic trade, the feudal knightly warlords gave way to the urban landed aristocracy, and warfare turned to the interplay of mercenary armies consisting of easily trained foot soldiers wielding muskets and other weapons based on gunpowder. Cavalry remained important in this era, but even in the eighteenth and nineteenth century, cavalry was used mainly to execute the *coup de grâce* on seriously weakened infantry.

The true hegemony of the foot soldier, and hence the origins of modern democracy, began with the perfection of the hand-held weapon, with its improved accuracy and greater firing rate than the primitive muskets of a previous era. Until that point, infantry was highly vulnerable to attack from heavy artillery. By the early twentieth century, the superiority of unskilled foot soldiers armed with rifles was assured. World War I opened in 1914 with substantial cavalry on all sides, but mounted troops were soundly defeated by men with rifles and machine guns and thus were abandoned in later stages of the war. The strength of the political forces agitating for political democracy in twentieth century Europe was predicated on the strategic role of the foot soldier in waging war and defending the peace (Bowles and Gintis 1986).

Conclusion

It is tempting to focus on the past 70,000 years of human cultural history when theorizing about human sociopolitical organization, because the changes that occurred during this period radically transformed the character of our species (Richerson and Boyd 2005; Pagel 2012). However, the basic genetic predispositions of humans underlying sociopolitical structure were forged over a much longer period of time: the million-plus-year perspective offered in this chapter.

The framework that we have developed here is applicable to many spheres of human culture, although we have applied it only to the evolution of sociopolitical structure. The central tool is *gene–culture coevolution*, which bids us pay close attention long-term to the dynamic interplay between our phylogenetic constitution and our cultural heritage. The second important conceptual tool is the *sociopsychological theory of norms*. Many social scientists reject this theory because it posits a causal social reality above the level of individual actors. This position is sometimes termed methodological individualism. Methodological individualism is not a philosophical, moral, or political principle, but an assertion about reality. As such, it is simply incorrect, because social norms are an emergent property of human society, irreducible to lower-level statements (Gintis 2009). All attempts to explain human culture without this higher-level construct fail.

We have suggested the following scenario for the long history of human sociopolitical dynamics. Our primate ancestors evolved a complex sociopolitical order based on a social dominance hierarchy in multi-male/multi-female groups. Enabled by bipedalism, environmental changes made a diet of meat from large animals fitness enhancing in the hominin line. This, together with cultural innovation in the domestication of fire, the practices of cooking and of collective child-rearing created a niche for hominins in which there was a high return to coordinated, cooperative, and competitive scavenging as well as technology-based extractive foraging. This, in turn, led to the use of stones and spears as lethal weapons, and thence to the reorganization of the upper torso, shoulders, arms, and hands to maximize the effectiveness of these weapons, as well as the growth of new neural circuitry allowing the rapid sequencing of bodily movements required for accurate weapon deployment.

The hominin niche increasingly required sophisticated coordination of collective meat procurement, a willingness to provide others with resources, the occasional, but critical reliance on resources produced by others, and procedures for the fair sharing of meat and collective duties. The availability of lethal weapons in early hominin society helped to stabilize this system because it undermined the tendencies of dominants to exploit others in society. Thus two successful sociopolitical structures arose to enhance the flexibility and efficiency of social cooperation in hominins: (a) reverse dominance hierarchy, which replaced social dominance based on physical power with a political system in which success depended on the ability of leaders to persuade and motivate, and (b) cooperative breeding and hunting, which provided a strong psychological predisposition toward prosociality and favored internalized norms of fairness. This system persisted until cultural changes in the Holocene fostered material wealth accumulation, through which it became once again possible to sustain a social dominance hierarchy based on coercion.

This scenario has important implications for political theory and social policy, for it suggests that humans are predisposed to seek dominance when this is not excessively costly, but also to form coalitions to depose pretenders to power. Moreover, humans are much more capable of forming powerful and sustainable coalitions than other primates, due to our enhanced cooperative psychological propensities. This implies that many forms of sociopolitical organization are compatible with the particular human amalgam of hierarchical and antihierarchical predispositions.

This also implies, in particular, that there is no inevitable triumph of liberal democratic over despotic political hierarchies. The open society will always be threatened by the forces of despotism, and a technology could easily arise that irremediably places democracy on the defensive. The future of politics in our species, in the absence of concerted emancipatory collective action, could well be something akin to George Orwell's *1984* or Aldous Huxley's *Brave New World*. Humans appear constitutionally indisposed to accept a social dominance hierarchy based on coercion unless the coercive mechanism and its associated social processes can be culturally legitimated. It is somewhat encouraging that such legitimation is difficult except in a few well-known ways, based on patriarchy, popular religion, or liberal democracy.

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