On Human Egalitarianism: An Evolutionary Product of Machiavellian Status Escalation?

David Erdal; Andrew Whiten; Christopher Boehm; Bruce Knauft

Current Anthropology, Vol. 35, No. 2. (Apr., 1994), pp. 175-183.

Stable URL:
http://links.jstor.org/sici?sici=0011-3204%28199404%2935%3A2%3C175%3AOHEAEP%3E2.0.CO%3B2-V

Current Anthropology is currently published by The University of Chicago Press.

---

shaped elements" rather than a "dense tapestry." He is ambivalent about Marx, first dismissing him, then elevating him as "an older anthropologist" and reasserting the core proposition that "men make their own history, but they do not make it just as they please." He escapes from "modes of production" by concrete reference to slaves and peasants, warriors and priests. This avoids controversy without advancing understanding.

He opens with race, culture, and people (ethnicity) as three notions on the same dimension but treats them very differently. He traces race through "the great archaic civilizations of the Old and New World," emphasizing "differential location on a spatial continuum," with differentiation of life-styles and physical appearance in the "dominant civilizational schemata." The Yanomami, introduced for contrast, lack the latter but share the former and surprisingly, in Wolf's version, make finer discriminations than the archaic civilizations do. Dubbing the Yanomami "egalitarian tribal" clearly has evolutionary implications, despite the emphasis on spatial continuum, and cannot but suggest the discredited Service evolutionary scheme that the latter himself was forced to abandon.

Instead of treating culture and ethnicity on this wide canvas, Wolf returns to the professional categories which at first he avoided. After briefly contrasting French Enlightenment universalist rationalism and German romantic uniqueness in *Volksgeist* passion and emotion, he seems to conflate the two by tracing the Greek *Volksgeist* through Winckelmann's beguiling poesy to the model of Western Classical education, idealized as a wholly integrated culture of perfection. So flowed the intellectual tradition of an "ideational holism at the root of culture," according to Wolf, through von Humboldt, Hegel, Nietzsche, Arnold, Frobenius, and Spengler to Ruth Benedict, as the very approach which Boas opposed. Such a glittering genealogy defies brief analysis and so is hardly open to question.

Wolf sees discourse on race predominant in the 19th century and discourse on culture increasingly so in the 20th, with ethnicity emerging as a "hot topic" in the eighties and nineties as world events also forced renewed attention to it. The trouble is that he introduces ethnicity first simply as "people," then as "peoplehood/ethnicity," conflating abstract and concrete but nowhere even broaching the vexed question of how culture and ethnicity are differentiated. Doing so would precipitate theories of political economy which he seeks to avoid. He sees definitions of ethnicity shifting to "formulas of cultural distinctiveness" as though the two were almost synonymous. Tracing these notions in the public arena seems to leave the anthropologists' own ideas hopelessly confused.

Fearing charges of determinism, writers now employ a bewildering variety of evasive metaphors for what might be in danger of being thought to be causation. In the present piece we find "shape," "reshape," and "shaped," "laying down," "preside over," "gave rise to," "has implications for," "prompted by," "limited by," "permitted," "one of the main causes" (great boldness here), "because," "wider implications," "prompt or constrain," "the how . . . but not yet the why," "organizational armatures around which cultural forms . . . form," "agency," "feeds back," "produces." Is this rich plethora justified by meaning, rhetoric, or euphony?

The public horror of racial-cultural-ethnic terrorism in Bosnia, however much media-manipulated, demands a responsible and theoretically coherent approach from anthropology. It is a geopolitical and religious situation bearing a close analogy with that of the small states in Germany which Engels said it would be ridiculous to explain in terms of economics even though Prussia arose from historical, ultimately economic causes. It is only the *ultimately* determining element in history which is the "production and reproduction of real life," perhaps a yet more perilous idea than the others. Political and philosophical ideas, religious beliefs, and the "traditions which haunt human minds" (culture and ethnicity) also influence historical struggles "and in many cases preponderate in determining their form" (Marx and Engels 1977:487). We follow writers such as E. P. Thompson and Raymond Williams in their understandings of determinism, base and superstructure, productive forces, and means of communication as means of production (Williams 1980:32, 34, 50). This approach in no way marginalizes culture in human life. If it is in any way made secondary, it is only in the ultimate perspective. Culture remains potentially preponderant in the ethnographic present.

References Cited

CARRIER, J. Editor. n.d. Occidentalism. MS.
MARX, K., AND F. ENGELS. 1977. *Selected works.* Vol. 3. Moscow: Progress Publishers.
WILLIAMS, RAYMOND. 1980. *Problems in materialism and culture.* London: Verso.
WOLF, ERIC R. 1982. *Europe and the people without history.* Berkeley and Los Angeles: University of California Press.
———. Perilous ideas: Race, culture, people. CURRENT ANTHROPOLOGY 35:1–12.

On Human Egalitarianism: An Evolutionary Product of Machiavellian Status Escalation?

DAVID ERDAL AND ANDREW WHITEN
School of Psychology, University of St. Andrews, St. Andrews, Fife KY169JU, Scotland. 8 IX 93

Egalitarianism in hunter-gatherer societies continues to present an evolutionary puzzle. It is not yet clear what social-psychological processes are responsible for keeping egalitarianism in place or how they evolved. The papers of Knauft (CA 32:391–428) and Boehm (CA 34: 227–54) represent important advances in understanding both in their recognition of the unique puzzle repre-

sented by human egalitarianism from evolutionary and comparative perspectives and in the solutions they offer. Their initiatives, however, fall short of what we believe an adequate evolutionary analysis must consider. We offer a critique of Boehm's thesis in particular which leads us to theoretical and empirical extensions of the endeavour these authors have begun.

An evolutionary model will seek to explain stable tendencies in human social behaviour as adaptations to specific aspects of the ecological and social environment in which *Homo sapiens* evolved. Archaeological data suggest that the ecological environment included various mixtures of forests and savannahs, with scattered vegetable and prey resources which sustained a hunter-gatherer mode of subsistence, at least for anatomically modern humans (Foley 1987). Hunter-gatherer ethnographic data suggest that the social environment was one of small mobile foraging groups in which most people were related, people knew each other intimately, strangers rarely being encountered, and food and other resources were shared.

There are well-rehearsed problems in taking data from modern hunter-gatherers and using such data as indicative of conditions in the Plio/Pleistocene (e.g., Foley 1987:75–77; Wilmsen and Denbow 1990). However, there are much greater problems in using data from societies which clearly had no parallel then. The evidence strongly suggests that the context in which *H. sapiens* evolved did *not* include domesticated food animals, domesticated plants, large usable food surpluses, systems for storing food over long periods of time, or concentrated, highly productive assets. We agree with Knauft that modern simple foraging societies provide the best source for inferences about behaviour characterising human evolution. By contrast, Boehm takes data from 48 societies a majority of which are not primarily hunters and gatherers. Their modes of subsistence are known not to have developed until at most 12,000 years ago, long after the emergence of *H. sapiens*. In principle, no conclusions can be drawn from these data regarding behaviour evolutionarily adaptive for *H. sapiens*.

Because Boehm uses data from post-hunter-gatherer societies, he mixes behaviour patterns characteristic of hunter-gatherers with behaviours that are simply not found among them. For example, deposing a leader implies that there is a leader to depose (p. 231): this is not true of hunter-gatherers, with the exception of some of the Indians of the Northwest Coast of North America, whose social structures developed round rich productive resources in relatively recent times (Kroeber 1939:29; Suttles 1968:105). Boehm also states that "children are manipulated and not infrequently physically disciplined; younger males and females are very often treated as chattels in marriage arrangements. Married females may be controlled decisively by males, while in many matrilineal-matrilocal societies married males meet with very decisive economic control. More generally, adult offspring may operate in domestic units that vest substantial authority in the parents" (p. 234)—none of which is characteristically descriptive of hunter-gatherers.

Boehm's great contribution is to establish clearly from the ethnographic literature that counterdominant behaviour is a widespread characteristic of humans. His model is static, offering an explanation of how egalitarianism is sustained rather than how it is generated in the first place. Yet the universality of egalitarianism in hunter-gatherers suggests that it is an ancient, evolved human pattern.

We had reached a conclusion similar to Boehm's about the significance and ubiquity of counterdominant behaviour, but our explanatory model is an evolutionary one. An evolutionary hypothesis must explain why it became adaptive for the hierarchically oriented ancestors of *H. sapiens* to behave in an egalitarian way and will seek the source of that egalitarianism in the reproductive consequences for individuals exhibiting that behaviour. In our model, counterdominant behaviour is a stable tendency, an adaptation to the social and physical environments of the Plio/Pleistocene. It represents a pattern which structures the cognitive and motivational psychology of each individual. It may only be manifested in specific circumstances, but it is an inherited tendency. The conscious decisions to prevent dominance catalogued by Boehm build on and elaborate it.

Boehm's model uses, as an explanatory variable, conscious, intentional choice. An evolutionary model must be compatible with the exercise—or sense of exercise—of conscious intention, but to invoke it as an explanatory variable is simply to move the puzzle one step further back. One is left, then, with the same question in a different form: how did conscious intention come to play this role? And whatever role consciousness plays, if humans as hunter-gatherers characteristically make some specific patterns of choices rather than others—sharing meat, for example, or forming groups of 20–50 persons, or countering dominant behaviour—then the prior question is: are there specific cognitive and motivational processes which lead people to make these particular patterns of choices, and if so, how did those cognitive and motivational processes evolve?

As illustration of the underlying evolutionary argument, we may recall Shepher's (1983) demonstration that the incest taboo is based on negative imprinting among children brought up together. The varied and enormously elaborated cultural definitions of the taboo can thus be understood as extensions and elaborations of this basic inherited developmental psychological process. It cannot be countered by socialisation (we cannot be trained or encouraged to feel sexually attracted towards those with whom we have spent our earliest childhood), but it can be culturally elaborated and extended. This in principle gives a general model of how conscious and culturally defined practices may be founded on stable inherited tendencies.

Knauft and Boehm interpret culture and conscious intent as undermining or counteracting biological motivations. For example, Knauft invokes culture as key in

bringing about food sharing instead of open competition for food (p. 395) and pair bonding instead of aggressive inter-male competition for sexual access (p. 397). Likewise, Boehm argues that "the primary and most immediate cause of egalitarian behavior is a moralistic determination on the part of a local group's main political actors that no one of its members should be allowed to dominate the others" (p. 228). In our view these cannot be evolutionary explanations. The cultural and consciously intentional elements are not crucial so long as these behaviours are adaptive, and conversely they are not sufficient if these behaviours are not adaptive. Rather, we see the cultural elaborations of food sharing, pair bonding, and egalitarianism as being grounded in inherited tendencies.

If human culture and consciousness evolved on a bedrock of inherited cognitive and motivational mechanisms which already underlay complex hominid social behaviour, it follows that conscious intention is unlikely to *contradict* seriously those inherited behaviour patterns. Both Boehm and Knauft cite Boyd and Richerson (1985) in support of the contention that cultural transmission can in principle allow such a contradiction to develop, but in fact these authors stress the fundamental role of evolved predispositions without which cultural evolution "would provide none of the fitness-enhancing advantages that must have favoured the evolution of capacities for culture" (Richerson and Boyd 1989:206).

Therefore, in contrast to the Knauft and Boehm view of culturally sustained, conscious intention running counter to stable inherited tendencies, our model predicts that culture and conscious action will generally fit with, build on, and elaborate such tendencies.

In our model, there is no *reversal* of hierarchy; we question the evidence for Boehm's concept of a "reverse dominance hierarchy." The tendency to recognise good performance and to defer to individuals who achieve it is a cross-culturally stable tendency which would have had a clear adaptive advantage in promoting the learning of effective behaviour and in structuring groups around effective individuals. Even among the most egalitarian of hunter-gatherers there is evidence that such recognition was given and was enjoyed by its recipients. Thus, Turnbull (1965:183) observes among the Mbuti that "some men, because of exceptional hunting skill, may come to resent it when their views are disregarded." This implies both that they are habitually listened to and that they enjoy it. Kaplan and Hill's (1985) work with the Ache suggests that although hunters achieve no material benefit from gaining such recognition, they may have more frequent mating opportunities, an important consequence for an adaptive model.

Although effective individuals are recognised and generally heeded, the function of leadership remains situational and is not transformed into a permanent social role with a distinct status. When leading individuals attempt to achieve personal dominance through making such a transformation, they are brought down several pegs by those around them, and they are never "obeyed" (Riches 1982:74). But this is best characterised as "counterdominant" behaviour rather than a reversal of hierarchy. It does not start with a hierarchy and reverse it: good performers are generally heeded and enjoy receiving that attention, but they are prevented from attaining dominance.

In our model, this enjoyment of recognition is an echo of dominance behaviour exhibited by the ancestor that *Homo* shared with the apes. This dominance behaviour was not entirely lost in evolution but was balanced by counterdominant tendencies which only evolved because they provided fitness advantages in the ecological and social environments of the time.

In hunter-gatherer conditions the fitness advantage provided by food sharing is the reduction of risk (Lovejoy 1981, Wiessner 1982, Cashdan 1985, Smith 1988). However, food sharing is not a simple evolved predisposition. The reports of meat sharing include references to cheating. For example, Turnbull (1965:198) reported that "it would be a rare Mbuti woman who did not conceal a portion of the catch in case she was forced to share with others." And Tanaka (1980:122) said of the San that "a man may sneak a small catch of game into his hut to share only with his family, or otherwise fail to share food as he should." Self-interest is at work at the individual level. Those who have meat sometimes try to avoid sharing it all. Those who do not have meat sometimes steal (Turnbull 1965:198). These behaviours are tolerated to an extent.

Among the same African hunter-gatherers, food sharing is characterised by arguments (Turnbull 1965:158; Tanaka 1980:95), and Bailey (1991:94) speaks of younger Efe men "yelling aggresively . . . begging obsequiously, and even occasionally snatching pieces of meat. . . . Never did overt physical violence break out, but extremely heated vociferous arguments were not uncommon." Envy and jealousy are sometimes observed to be important in this process of sharing (e.g., Marshall 1976 [1961]:368; Briggs 1970:47; Tanaka 1980:113). These motivations are interesting because they move the emphasis away from simple self-interest towards a *sense of fairness* (Trivers 1971), an interest in ensuring that "others do not get more than I do" and then, through anticipation of others' reactions, that "I do not take more than others." Cosmides and Tooby (1987) have offered experimental evidence that humans are well equipped to detect cheating.

We propose the term "vigilant sharing" to cover this complex food-sharing behaviour. Kaplan and Hill's (1985) tests rejected all hypotheses to explain food sharing except that food is distributed in such a way that everyone is fed. We suggest that this is the result, at the level of the social system, of the behaviour of sociable and self-interested individuals whose motivations include a strong desire to get enough for themselves coupled with a strong desire to make sure that no one else gets more than they do. One important implication of this is that counterdominance ("no one is going to get

away with more than I") is an economically efficient predisposition: it ensures that sharing takes place, and, given the risk profile of hunting, sharing rather than attempted dominance is the efficient strategy.

If dominance patterns were indeed balanced by counterdominant tactics rather than being eliminated, then there would still be a psychological potential to create dominance hierarchies, given triggering circumstances which rendered the counterdominant tendencies inoperative or ineffective. It is plausible that the concentrated resource conditions created by herding and agriculture provided exactly such triggering circumstances (Testart 1987, Johnson and Earle 1987). This model fits the timescales required: first, an extended process of biologically driven evolution (>1 million years) which led to the expansion of the human brain and the evolution of egalitarian behaviour and viligant sharing, and second, a relatively sudden change of social behaviour (ca. 12,000 years B.P.) driven by an unchanged psychology meeting circumstances entirely different from those in which it evolved. This led to the creation of hierarchies because the counterdominant tendencies were disabled by the new environment. Such hierarchies are not merely reborn ape hierarchies but uniquely human in both their behavioural detail and their cultural recognition.

In common with humans, chimpanzees display tactics such as alliance formation and deception through which dominant individuals can be socially manipulated despite their inherent power (de Waal 1982, 1992). The "Machiavellian intelligence" expressed in such tactics (Whiten and Byrne 1988) would thus likely have characterised the human-chimpanzee common ancestor.

If the subsequent rapid evolutionary expansion of the hominid brain was associated with greater Machiavellian intelligence (Dunbar 1993), an escalation would have been set up between the capacities of group members to manipulate the dominants and the ability of dominant individuals to counter such skills. Indeed, such a spiral might have played a causal role in the encephalisation which took place. Given such an evolutionary escalation, eventually the maintenance of direct dominance would have become prohibitively costly in time and/or energy. Under these circumstances there would have been a fitness advantage to the strategy of "vigilant sharing" or "playing fair"—of resisting dominance by others but not attempting to achieve dominance oneself. This would have produced in each individual a complex set of competing motivations—including tendencies both to dominate and not to dominate, both to defer and to resist domination, both to share and to be opportunistically selfish, all according to circumstance.

Such a psychology of balancing, contradictory tendencies would have created multiple choices for each individual in any specific social situation. This in itself would have given each individual great behavioural flexibility. It could also have given an adaptive advantage to what we experience as considerable conscious, intentional choice. If there are multiple, competing, contradictory psychological tendencies, then the ability to hold the options in mind and measure them against important aspects of the situation would provide a particularly important function for conscious deliberation.

This model stands Boehm's on its head. Egalitarian behaviour patterns evolved because with the development of self-control individuals became so clever at not losing out to dominant individuals that vigilant sharing became possible, and this was the most effective economic strategy in the circumstances in which *H. sapiens* evolved. As a result of the complex set of internally contradictory behavioural tendencies which were entailed, conceptual inputs to decision making became particularly crucial elements of human psychology. The extent to which conscious intention is the master rather than the servant of our inherited behaviour patterns is not clear, but at minimum conscious deliberation seems to have some effect in expanding the options for our behaviour.

Subsequent hierarchies were built in response to new economic circumstances with wholly different incentive structures, in which the counterdominant tendencies became disabled and ineffective except on the sporadic basis documented by Boehm.

Replies

CHRISTOPHER BOEHM
Department of Anthropology, University of Southern California, Los Angeles, Calif. 90089-0032, U.S.A.
9 XI 93

Erdal and Whiten raise several interesting issues involving the conscious intentions of nonliterate human beings. Ethnologically speaking, the effects of such intentions have been lost in the explanatory shuffle, mainly because anthropology's favorite paradigms are either "structural" or "formal" and are borrowed from disciplines that deal with entirely self-organizing systems. One reason I chose to study egalitarian behavior was that it offered an opportunity to factor purposeful behavior into the cultural equation. The thesis was that although egalitarian societies appear to be devoid of hierarchical behavior among males, from time to time certain men try to dominate their fellows. They are dealt with through a variety of sanctions, most of which are found among simple foragers as Knauft defines them. Sanctions are enacted purposefully by a moral community that coalesces around the issue of personal autonomy and equality of males. Their application is rarely reported because they are so predictable to members of the society; most would-be upstarts remain cautious or cowed. Such purposeful group domination is, I argued, the most influential causal common denominator among a very wide range of egalitarian societies and, as an independent variable, should be weighted more heavily than the various ecological influences that are normally cited to explain egalitarian societies one at a time. Introducing conscious intentions into ethnology

in this instance provides an alternative way of explaining an important social type. Erdal and Whiten seem somewhat uncomfortable with this approach, perhaps because it smacks of "teleology." Attempts to keep ethnology distanced from the study of human "purposes" have a long history, the most recent being a stridently antipsychological version of "cultural materialism." Erdal and Whiten seem to favor a psychological approach, yet they suggest that Knauft and I present culturally sustained intentions as running counter to inherited tendencies—that we view culture in its goal-directed mode as a kind of independent variable from somewhere "outside the system."

I believe that egalitarian behavior results from a long history of coevolution. Genes provide tendencies toward domination and submission and generate psychological ambivalence over submission because dominance tends to be more satisfying. The capacity for purposeful and decisive collective action provides a cultural antidote to the domination tendencies of would-be alpha males that over the generations ensures that stronger individuals cannot establish despotic political styles or dynasties. The cultural antidote is obviously not independent of behavior genes, for it is built upon ambivalence over submission and is effective because group members use their potential for domination collectively.

Purposeful behavior becomes analytically important when it has behavioral outcomes that vary from what genes, environment, and self-organizing systems make predictable on their own. An egalitarian state of political affairs results from what amounts to a social compact: adult males agree to give up their individual possibilities for domination of others in order to be certain that no one individual may dominate them. This set of concerns directly underlies the preoccupation with personal autonomy that is so predictable among foragers (see Gardner 1992). It is because groups deliberately and insightfully enter into this compact that purposeful behavior becomes analytically important; "culture" is shaping behavior in an important way here. I have called such societies "reverse dominance hierarchies" because, over time, there always seem to be upstarts who will try to gain personal power and because the group predictably curbs them. Thus, in egalitarian society moral sanctioning is a special, emergency type of domination by the group that is considered politically legitimate even though individual domination is not.

It is well known that morality works "counterhedonically" to diminish the effects of various behaviors that we are genetically disposed to, for example, inappropriately lustful behavior or murder (see Campbell 1975). Egalitarian manipulations are simply one more instance of humans' using moral sanctioning as a way of sorting through the effects of raw materials given by human nature and making some choices about tendencies that should be suppressed or reinforced. This purposeful capacity is an evolved one that is surely a function of our large brain. It can neither be separated from our natural history nor taken for granted.

Any new theory about egalitarian society has implications for prehistoric interpretation. Erdal and Whiten suggest that I improperly mixed societal categories by pooling egalitarian behaviors of simple foragers, complex foragers, and sedentary tribesmen and by including sanctions such as deposition when simple foragers are reported to lack leaders. Had my focus been on prehistory this criticism would be appropriate. However, my aim was to demonstrate that egalitarian political arrangements derive not mainly from special ecological or social-structural circumstances but from moral sanctioning. Because "egalitarianism" was not limited to simple foragers or even to foragers in general, I took it into account wherever I found it. It would be a simple matter to perform a similar analysis solely upon simple foragers. The first task, however, was simply to convince colleagues that "reverse dominance hierarchy" was a useful concept.

Erdal and Whiten correctly state that I view "counterdominant behavior" as present in all human societies. Does this make politically centralized societies that curb their rogue politicians "reverse dominance hierarchies"? I think not. What changed radically with the transition to chiefdoms was the cultural definition of the threshold at which collective counterdominant behavior was activated. Leaders became able to command their former peers *legitimately* in many contexts, and the strong egalitarian ideology ceased to drive behavior definitively and in most cases atrophied or disappeared. Physical environmental factors and factors of social scale or group composition were obviously important, but more immediately it was the granting of limited yet substantial authority and the general acceptance of status differences that effected the transition to orthodox hierarchies. I disagree with Erdal and Whiten that counterdominant tendencies became ineffective except "sporadically" in orthodox hierarchies. Any prudent leader understands that assassination or popular revolt is possible, and a leader who is unrealistic or unlucky may be deposed. This is not reverse dominance hierarchy, however, because followers merely exchange an abusive leader for one who is not. Power remains concentrated at the top rather than being neutralized as in a band or tribe.

Social-biological scenarios that relate egalitarian domination by the group to "the reproductive consequences for individuals" are easy enough to imagine. Assuming that alpha-male-type hominids/humans had superior nutrition, were siring more surviving progeny, and possibly were in a position to help their closer kin, their genetic advantage would seriously diminish with the advent of egalitarian behavior. By contrast, rank-and-file types would gain an improved reproductive position, for each would gain equally (if modestly) by helping to create a system of equal sharing of power and resources. If this "revolution" was ancient, then many millennia of egalitarian behavior probably modified the behavior genes involved in domination and submission. This may help to explain some of the differences between humans and chimpanzees and gorillas with respect to agonistic potential. However, it is apparent that human nature

still had the potential to support orthodox hierarchies, for once domestication of plants was accomplished and group size and stability began to increase they independently reappeared in many locations.

To explore such a scenario more fully, one would have to speak to the issues of behavioral dispositions for both dominance and submission, for coalition formation, for sensitivity to group opinion and self-control, and for whatever else it takes to maintain a moral community. One would also have to account for the context: the ecological constraints, group size and structure, individual differences in genetic predispositions and other behaviors relevant to political power, and the distribution of wealth. Erdal and Whiten's notion of "vigilant sharing" of food resources by people who are ambivalent about sharing fits nicely into this picture and is relevant to the equally vigilant sharing of *power* that I described. It would seem that the two may have been interdependent. Indeed, the food-sharing arrangements of simple foragers would not be likely to work if decisive political power remained in the hands of a few, while if large-game meat were not shared it could be difficult to equalize power. Thus I would link three developments (Boehm 1982): (1) the moral community capable of making rules for behavior and sanctioning deviants, including those who committed incest, cheaters, and political upstarts, (2) domination of potential alphas by the egalitarian group, leading to equalized power sharing, and (3) large-game hunting with compulsory sharing of meat. The egalitarian political revolution may well have taken place in conjunction with large-game hunting, since among simple foragers individual proficiency at other types of food acquisition is less likely to lead to domination.

I agree with Erdal and Whiten's implication that because the cooperation of foragers is often so well-routinized we may have missed its subtle conflict component. My suggestion is that, like large-game meat, political power has been indigenously defined as group property, and individuals who would challenge an established tradition of power sharing can predict the group's hostile reaction. That they nonetheless push such limits in simple foraging societies is apparent from my paper, and I devoted considerable discussion to the Australian Aborigines because not only are they foragers (some of them "simple") but also their historical links to the late Paleolithic are exceptionally solid.

While egalitarian food sharing may be enjoyable in its own right, it depends upon a latent political threat just as does the sharing of power. An egalitarian way of doing political business largely redirects individual tendencies to compete or dominate from individually selfish self-assertion to collective vigilance against selfishness. These are not very "benign" definitions of cooperative behavior or of "primitive democracy," but they do explain why blatant cheating remains well controlled among simple foragers, in spite of the rough spots pointed out by Erdal and Whiten, and why serious attempts at domination remain rare in their political life. Among such people there were at least two commodities that the group did not wish to see fall into the hands of dominantly selfish individuals: large-game meat and the power to abrogate another adult's all-but-sacred personal autonomy. The response in both cases was to see to it that the commodity was shared, even though certain individuals might do so with reluctance.

Much of what Erdal and Whiten say about the evolution of contradictory tendencies ("competing motivations") in human nature makes good sense to me. Indeed, in a different political context I have examined ambivalence and compromise in some detail (Boehm 1989). More generally, I believe that such an approach will be necessary if we are to make our analyses of genotypic dispositions and their impact on cultural behavior clearly relevant to anthropologists not directly involved with what Durham (1991) calls "evolutionary anthropology."

Aside from our partly differing interpretations about hierarchies' being reversed and their apparently limited definition of evolutionary analysis, I find aspects of Erdal and Whiten's perspective quite useful insofar as motives and intentions are not set aside or minimized just because they provide unwieldy. By giving greater attention to such variables we may eventually be in a better position to elaborate the evolutionary branch of anthropology. The analyses will go beyond the often very highly "theoretical" assessments of reproductive consequences associated with "sociobiology" to include hard data and general considerations about human nature.

Sanctioning of potential upstarts by the rank and file is purposeful and actively shapes the content of culture. In fact, it may be considered a form of "cultural selection." After two decades of social/biological analysis in anthropology, it seems curious that so much energy has been given to speculative inclusive-fitness scenarios and so little to efforts to achieve breakthroughs in the direct study of cultural selection mechanics, an area that has not yielded readily to empirical analysis (see Durham 1991). One way in which cultural content is shaped is through decisions and their implementation (Boehm 1978). This mechanism of cultural selection must be given serious consideration, for it was sufficiently potent to turn the usual primate social structure upside down until conditions were right for its reemergence. In less definitive form, counterdominant forces persist today in hierarchical societies, either as latent threats, formal checks and balances in government, or revolutions and popularly based assassination conspiracies. My suggestion, and I think that Erdal and Whiten might agree, is that anthropology sort out the psychological variables that are needed to explain such behavior and begin to take human nature into account. To name just one benefit, further work in this direction might provide all anthropologists with a better conception of how culture actually *works*.[1]

1. I thank Steven J. Lansing for commenting on a draft of this reply. The original research on which the article was based was supported by H. F. Guggenheim Foundation and the National Endowment for the Humanities.

BRUCE KNAUFT
Department of Anthropology, Emory University, Atlanta, Ga. 30322, U.S.A. 14 X 93

Before addressing disagreements, I want to note points of convergence in the assessments of Erdal and Whiten, Boehm (see also 1989), and me (see also 1987, 1988, 1989, n.d.): (1) A strong tendency toward egalitarian behavior over a significant portion of human evolution is likely. (2) A significant primate tendency toward social dominance was not extinguished but effectively constrained by strong counterpressures during much of this period. (3) Marked male dominance hierarchies among *Homo sapiens sapiens* arose relatively recently, first in complex hunter-gatherer adaptations and then more generally in the context of increasing sedentism, the domestication of plants and animals, the accumulation of material property, and increasing sociopolitical complexity. (4) These more recent dominance hierarchies are, in Erdal and Whiten's felicitous phrasing, "not merely reborn ape hierarchies but uniquely human in both their behavioural detail and their cultural recognition." Together, these points indicate important movement beyond evolutionary models that assumed simple continuity in structure between pongid dominance hierarchies and those of *Homo*.

Evidence from chimpanzees illustrates patterns of cooperation preadapted for the counterdominance found among simple human groups. De Waal (1982; 1989:chap. 2) describes a coalition involving two apparently unrelated adult chimpanzees who violently killed a third chimpanzee stronger than either of them and poised to assume the alpha position in the group. Though such counterdominance may occasionally occur, the general trend among chimpanzees, bonobos, and gorillas is toward prominent male dominance hierarchies. The reverse is true among simple human societies: marked male dominance is transitory and counterdominance normative.

The key ape-human difference here may be the apes' *willingness to demonstrate subordination*. All the social great-ape species have pronounced behavioral displays of submission that are important if not crucial in facilitating social coexistence and, especially, reconciliation (de Waal 1989). Such public and formal displays of deference to a leader or potential strongman are absent in simple human societies, and this lack of behaviorally formalized submission is elevated to a very strong cultural norm; informal status leveling through humor, innuendo, and public social support is deeply entrenched (and may be internalized within the individual as a check on aspirations to dominance). This reluctance to show submission persists in a less publicly valorized and more individualized form in the "Don't mess with me" ethic of men in the many more complex societies that Boehm includes in his sample.

It is an empirical question whether the benefits of normative cooperation in counterdominance can be explained in terms of self-interested reciprocal altruism as Erdal and Whiten imply (see Axelrod and Hamilton 1981, Trivers 1985). The spatial and sexual dispersal of decentralized human foragers—a pattern that makes us distinctive as a primate species (Rodseth et al. 1991)—combines with the great social fluidity of band composition to undermine self-interested enforcement of reciprocal altruism in human evolution. Rule-of-thumb sociality of the kind experimentally documented by Caporael et al. (1989) seems a more likely candidate for promoter of prosocial behavior. Rule following itself has protoforms in chimpanzees and bonobos, as is illustrated by the blindman's-buff behavior that de Waal (1989:195–96) has observed in bonobos. Likewise, emphasis on gift giving in simple human societies has a rudimentary protoform in chimpanzees' grudging transfers of prized food items such as meat.

Humans are distinctive in their internalization of prosocial rules that have diffuse potential benefits to the group, including increase of truthful information transfer and promotion of subsequent reciprocity as well as conflict reduction per se. Erdal and Whiten suggest increasing tension between dominance and counterdominance in human evolution; I concur wholeheartedly and indeed made a similar argument myself concerning the evolutionary arms race between sexual drive and cultural control in humans (1991:400 n. 10). I would add only that what underlies this Machiavellian escalation is the *competition* between rule-governed egalitarianism and narrow self-interest that could preclude normative and potentially quite risky cooperation between unrelated males in leveling coalitions. Such a "psychology of balancing, contradictory tendencies," incidentally, is reminiscent of Boehm's (1989) argument, uncited by Erdal and Whiten, that "human nature" is not monolithic but should be considered as the outcome of competing forces that commonly result in behavioral ambivalence.

The most important and stimulating disagreements between Erdal and Whiten, Boehm, and me concern the causal mechanism of reverse dominance hierarchies or counterdominance in human evolution. I concur with Erdal and Whiten that models of prehistoric human social evolution should pay more attention to observational information from simple human societies, such as decentralized foragers, and less to information from food-producing societies and complex hunter-gatherers. I also agree with them that conscious intention is not a *sufficient* cause of counterdominance, though it may certainly remain an important or even a necessary part of counterdominance in humans. Boehm emphasizes proximate behavioral causes of counterdominance while Erdal and Whiten emphasize ultimate evolutionary causes; in this restricted sense, their arguments are on different levels of analysis and not mutually exclusive—a point that Boehm (p. 248) himself foreshadows. "Conscious intention" was likely not as important in the evolutionary *origin* of human culture as in its persistence and intensification. Among humans, intentional aversion to submission is importantly connected to social *rules* of status leveling; together, these lend more collective support and social efficacy to counterdominance than either cultural rules or conscious intentions alone.

I agree that culture must have developed through evolved predispositions (indeed, I do not see how Erdal and Whiten could interpret my arguments otherwise). The important implication is that human culture first developed through the law of unintended consequences whereby traits selected in one context were preadapted or "exapted" in others (Gould and Vrba 1982). Imitation and learning through socialization were likely just such features in human evolution. In partial contrast to Boehm, I afford a much greater role to imitation than to "intention" (a term that he does not define but that I take to be the conscious recognition of a desirable end point and the use of this end point as a self-recognized motive for behavior). Conversely, as Boyd and Richerson (1985) suggest, adaptive "learning" may be overrated as an originating force in the evolution of human culture, though its small incremental effect may have been significant when compounded and transmitted over many generations.

Whiten and Ham (1992) have emphasized that imitation in an experimentally rigorous sense is surprisingly rare in nonhuman species other than chimpanzees (and probably bonobos). This strongly suggests that the vastly increased cognitive capacities of human metarepresentation led to a qualitative increase in human imitation (Whiten and Byrne 1991). This trend is highly consistent with the prolonged altriciality of *H. sapiens* and likely evolutionary dependence on culturally constituted communication in the form of protolanguage and then language (Bickerton 1992; Goodenough 1990; Knauft, p. 398). Imitation and rapid horizontal transmission of phenotypic variation allow the temporary spread of behavior that may be nonoptimal or slightly maladaptive from an individual point of view. In the absence of competing pressures, such behavior will be selected against through standard biogenetic selection. If it also happens to be exapted for group-adaptive results, however, this process may be slowed or even reversed. In this event, the survival chances of members of the group may be marginally increased. The patchy and dispersed resource environments characteristic of human evolution and the associated selective pressure for sharing of information (Kurland and Beckerman 1985) make some degree of group-level adaptation empirically as well as logically plausible.

My 1991 argument stressed that group-adaptive behavior did *not* eradicate selection for self-interested behavior; both pressures persist and remain in tension today. One example is the ongoing conflict between self-interested sexual desires and cultural rules that influence sexual behavior. It seems empirically inadequate to rely solely on models that assume a self-interested arms race of deception to explain cultural rules, altruistic moral norms, and language itself (e.g., as proposed by Erdal and Whiten, Burling [1986], and Alexander [1987]). Such models do not explain how or why such an arms race could generate the baseline of linguistic-referential trust and social affiliation among unrelated individuals upon which complex structures of human social and cultural organization depend (Knauft n.d.). The restrictive criteria for reciprocal altruism (Boyd and Lorberbaum 1987, Boyd 1988, Richerson and Boyd 1989; cf. Rogers 1990) and the ease of cheating in situations that are not carefully monitored (such as the spatial separation of prehistoric men and women in a sexual division of labor) ground this one-sided paradigm in weak empirical assumptions for the study of distinctively human evolution (see, more generally, Wilson 1989, 1992; Wilson and Sober 1989, n.d.; Sober 1992).

What is still relatively lacking in the study of social evolution is rigorous models that take into account both biogenetic selection processes and the cultural channels of selection that increase the variability of human behavior and its potential to be adaptive or maladaptive at the group level (e.g., Edgerton 1992; Knauft 1993:chap. 8; contrast Durham 1991). Aversion to submission in human evolution, both between males and between males and females, is particularly important. The relationship between counterdominance and sex, sex roles, and the development of gender rules needs special attention; what role do females play in dominance or counterdominance, and what is the relationship between counterdominance and female mate selection? Females and their male kin in simple human societies often show a strong aversion to male suitors who are prone to domestic violence or fail to respect the rights of women. Even in the case of coalitional male-chimpanzee killing noted above, de Waal (1989:68) mentions that a smaller female who was a close social ally of the dead male became enraged following his death, drove one of the victorious males up a tree, and by screaming and charging prevented him from descending for over ten minutes. As Worthman (1991:384) has noted, our study of dominance and counterdominance in human evolution reflects a strong male bias; human "egalitarianism" refers almost exclusively to political relations among adult men. Models also overwhelmingly emphasize the individual as the unit of phenotypic alteration, adaptation, and selection despite the unique role of cultural rules and the rapid spread of behavior through imitation among humans. Given that cultural transmission has long exerted a significant influence on the social environment of humans, it is likely that cultural and biogenetic selection pressures on females and males have been in complex tension for a significant portion of our genus's evolutionary history.

References Cited

ALEXANDER, RICHARD D. 1987. *The biology of moral systems.* New York: Aldine de Gruyter.

AXELROD, R., AND W. D. HAMILTON. 1981. The evolution of cooperation. *Science* 211:1390–96.

BAILEY, ROBERT. 1991. *The behavioural ecology of Efe Pygmy men in the Ituri Forest, Zaire.* University of Michigan Museum of Anthropology Anthropological Papers 86.

BICKERTON, DEREK. 1990. *Language and species.* Chicago: University of Chicago Press.

BOEHM, CHRISTOPHER. 1978. Rational preselection from hamadryas to *Homo sapiens:* The place of decisions in adaptive process. *American Anthropologist* 80:265–96.

———. 1982. The evolutionary development of morality as an effect of dominance behavior and conflict interference. *Journal of Social and Biological Sciences* 5:413–22.

———. 1989. Ambivalence and compromise in human nature. *American Anthropologist* 91:921–39.
———. 1993*a*. Egalitarian behavior and reverse dominance hierarchy. CURRENT ANTHROPOLOGY 34:227–54.
———. 1993*b*. Chimpanzee conflict resolution and the evolution of morality. Paper presented to symposium on the evolution of moral systems at the annual meeting of the Human Behavior and Evolution Society, Binghamton, N.Y.
BOYD, ROBERT. 1988. The evolution of reciprocity in sizable groups. *Journal of Theoretical Biology* 132:337–56.
BOYD, ROBERT, AND J. P. LORBERBAUM. 1987. No pure strategy is evolutionarily stable in the repeated prisoner's dilemma game. *Nature* 327:58–59.
BOYD, ROBERT, AND PETER J. RICHERSON. 1985. *Culture and the evolutionary process.* Chicago: University of Chicago Press.
BRIGGS, JEAN L. 1970. *Never in anger: A portrait of an Eskimo family.* Cambridge: Harvard University Press.
BURLING, ROBBINS. 1986. The selective advantage of complex language. *Ethology and Sociobiology* 7:1–16.
CAMPBELL, DONALD T. 1975. On the conflicts between biological and social evolution and between psychology and moral tradition. *American Psychologist* 30:1103–26.
CAPORAEL, LINNDA R., ROBYN M. DAWES, JOHN M. ORBELL, AND ALPHONS J. C. VAN DE KRAGT. 1989. Selfishness examined: Cooperation in the absence of egoistic incentives. *Behavioral and Brain Sciences* 12:683–739.
CASHDAN, ELIZABETH A. 1985. Coping with risk: Reciprocity among the Basarwa of northern Botswana. *Man* 20:454–74.
COSMIDES, LEDA, AND JOHN TOOBY. 1987. Evolutionary psychology and the generation of culture, part 2: A computational theory of social exchange. *Ethology and Sociobiology* 10:51–97.
DE WAAL, FRANS B. M. 1982. *Chimpanzee politics.* London: Jonathan Cape.
———. 1989. *Peacemaking among primates.* Cambridge: Harvard University Press.
———. 1992. Intentional deception in primates. *Evolutionary Anthropology* 1:86–92.
DUNBAR, ROBIN I. M. 1993. Coevolution of neocortex size, group size, and language in humans. *Behavioural and Brain Sciences.* In press.
DURHAM, WILLIAM H. 1991. *Coevolution: Genes, culture, and human diversity.* Stanford: Stanford University Press.
EDGERTON, ROBERT B. 1992. *Sick societies: Challenging the myth of primitive harmony.* New York: Free Press.
FOLEY, ROBERT. 1987. *Another unique species.* Harlow: Longman.
GARDNER, PETER. 1992. Foragers' pursuit of individual autonomy. CURRENT ANTHROPOLOGY 32:543–58.
GOODENOUGH, WARD H. 1990. Evolution of the human capacity for beliefs. *American Anthropologist* 91:597–612.
GOULD, S. J., AND E. S. VRBA. 1982. Exaptation: A missing term in the science of form. *Paleobiology* 8:4–15.
JOHNSON, ALLEN W., AND TIMOTHY EARLE. 1987. *The evolution of human societies: From foraging group to agrarian state.* Stanford: Stanford University Press.
KAPLAN, HILLARD, AND KIM HILL. 1985. Food sharing among Ache foragers: Tests of explanatory hypotheses. CURRENT ANTHROPOLOGY 26:223–45.
KNAUFT, BRUCE M. 1987. Reconsidering violence in simple human societies: Homicide among the Gebusi of New Guinea. CURRENT ANTHROPOLOGY 28:457–500.
———. 1988. Reply. CURRENT ANTHROPOLOGY 29:629–33.
———. 1989. Sociality versus self-interest in human evolution. *Behavioral and Brain Sciences* 12:712–13.
———. 1991. Violence and sociality in human evolution. CURRENT ANTHROPOLOGY 32:391–428.
———. 1993. *South Coast New Guinea cultures: History, comparison, dialectic.* Cambridge: Cambridge University Press.
———. n.d. "Culture and cooperation in human evolution," in *The anthropology of peace and nonviolence.* Edited by Leslie E. Sponsel and Thomas A. Gregor. Boulder: Lynne Rienner.
KROEBER, A. L. 1939. *Cultural and natural areas of native North America.* Berkeley: University of California Press.
KURLAND, JEFFREY A., AND STEPHÉN J. BECKERMAN. 1985. Optimal foraging and hominid evolution: Labor and reciprocity. *American Anthropologist* 86:73–93.
LOVEJOY, C. OWEN. 1981. The origin of man. *Science* 211: 341–50.
MARSHALL, LORNA. 1976 (1961). "Sharing, talking, and giving: Relief of social tension among !Kung Bushmen," in *Kalahari hunter-gatherers: Studies of the !Kung San and their neighbors.* Edited by Richard B. Lee and Irven DeVore, pp. 349–72. Cambridge: Harvard University Press.
RICHERSON, PETER J., AND ROBERT BOYD. 1989. The role of evolved predispositions in cultural evolution. *Ethology and Sociobiology* 10:195–219.
RICHES, DAVID. 1982. *Northern nomadic hunter-gatherers: A humanistic approach.* London: Academic Press.
RODSETH, LARS, RICHARD W. WRANGHAM, ALISA M. HARRIGAN, AND BARBARA B. SMUTS. 1991. The human community as a primate society. CURRENT ANTHROPOLOGY 32: 221–54.
ROGERS, ALAN R. 1990. Group selection by selective emigration: The effects of migration and kin structure. *American Naturalist* 135:398–413.
SHEPHER, JOSEPH. 1983. *Incest: A biosocial view.* London: Academic Press.
SMITH, ERIC ALDEN. 1988. "Risk and uncertainty in the 'original affluent society,'" in *Hunters and gatherers,* vol. 1. *History, evolution, and social change.* Edited by Timothy Ingold, David Riches, and James Woodburn, pp. 222–51. Oxford: Berg.
SOBER, ELLIOTT. 1992. The evolution of altruism: Correlation, cost, and benefit. *Biology and Philosophy* 7:177–88.
SUTTLES, W. 1968. "Variation in habitat and culture on the North West Coast," in *Man in adaptation,* vol. 2. Edited by Y. Cohen. Chicago: Aldine.
TANAKA, JIRO. 1980. *The San hunter-gatherers of the Kalahari: A study in ecological anthropology.* Tokyo: University of Tokyo Press.
TESTART, ALAIN. 1987. Game sharing systems and kinship systems among hunter-gatherers. *Man* 22:287–304.
TRIVERS, ROBERT L. 1971. The evolution of reciprocal altruism. *Quarterly Review of Biology* 46:35–57.
———. 1985. *Social evolution.* Menlo Park, Calif.: Cummings.
TURNBULL, COLIN. 1965. *Wayward servants.* London: Eyre and Spottiswoode.
WHITEN, ANDREW, AND RICHARD W. BYRNE. 1988. "Taking Machiavellian intelligence apart," in *Machiavellian intelligence.* Edited by Richard W. Byrne and Andrew Whiten, pp. 50–65. Oxford: Oxford University Press.
———. 1991. "The emergence of metarepresentation in human ontogeny and primate phylogeny," in *Natural theories of mind: Evolution, development, and simulation of everyday mindreading.* Edited by Andrew Whiten, pp. 267–81. Oxford: Basil Blackwell.
WHITEN, ANDREW, AND R. HAM. 1992. On the nature and evolution of imitation in the animal kindgom: Reappraisal of a century of research. *Advances in the Study of Behavior* 21: 239–83.
WIESSNER, POLLY. 1982. "Risk, reciprocity, and social influences on !Kung San economics," in *Politics and history in band society.* Edited by Eleanor Leacock and Richard Lee, pp. 61–84. Cambridge: Cambridge University Press.
WILMSEN, EDWIN, AND JAMES DENBOW. 1990. A paradigmatic history of the San. CURRENT ANTHROPOLOGY 31:489–506.
WILSON, DAVID S. 1989. Levels of selection: An alternative to individualism in biology and the social sciences. *Social Networks* 11:257–72.
———. 1992. Complex interactions in metacommunities, with implications for biodiversity and higher levels of selection. *Ecology* 73:1984–2000.
WILSON, DAVID S., AND ELLIOTT SOBER. 1989. Reviving the superorganism. *Journal of Theoretical Biology* 136:337–56.
———. n.d. Re-introducing group selection to the human behavioral sciences. MS.
WORTHMAN, CAROL M. 1991. Comment on: Intergroup aggression in chimpanzees and humans, by Joseph H. Manson and Richard W. Wrangham. CURRENT ANTHROPOLOGY 32: 384–85.