



# What Makes Humans Economically Distinctive? A Three-Species Evolutionary Comparison and Historical Analysis

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**Synopsis:** The fundamental problem, of what makes humans economically distinctive, is addressed here by using a highly focused cross-species analysis to examine the evolution of property relations. Chimpanzees and bonobos are compared with mobile human foragers, and it is argued that our egalitarian political practices, in conjunction with variance-reduction practices we applied prehistorically to large-game meat consumption, led to a critical evolutionary transformation. The transition began with private property at the ancestral level, but ended with humans having not only private property, but communal property.

**Key words:** bonobos, chimpanzees, communal property, egalitarianism, hunter-gatherers, private property, social control, social evolution, variance reduction

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## 1. Introduction

In an effort to determine what is uniquely human from the standpoint of economic behavior, Pryor (2003) has compared a dozen primate species with hunter-gatherers as an evolutionarily appropriate human type. His main conclusion is that humans alone have economic systems and institutions that are mutable, that is, they are capable of cultural transformation. Other loci of human uniqueness include a distinctive division of labor, distinctive methods of food distribution, special technologies, and the use of home bases. None of these differences would come as a major surprise to a primatologist or a cultural anthropologist, but this comparison of humans with all other primates comprises a comprehensive and novel piece of scholarship, and it points the way to further comparison.

In building on this first effort, I believe it will be useful to narrow the focus in several ways. Here, I shall concentrate just on the notion of ‘property’, a dimension of comparison that figures only indirectly in Pryor’s conclusions. I do so because focusing on property raises important issues about human social cooperation and how it should be defined in its economic dimension, and also because it involves a crucial economic distinction, that between private and communal

property. I shall be suggesting that communal property, as this is held by humans living in groups, is distinctive in our species if we compare ourselves with other social mammals that also depend heavily upon group traditions in their social and subsistence life.

There is a further way to narrow the focus. Pryor has taken the entire primate family (or clade) as the basis for synchronic comparison with humans, concentrating on all six of the great and lesser ape species, three of them African and three Asian, and sampling another two species each from the prosimians and from New and Old World Monkeys, respectively. There are, of course, many ways of going about such a comparison, and, at first blush, the ultimate test would be to compare humans in a full evolutionary context with the one primate that we think is maximally similar to us. However, this amounts to what Tooby & DeVore (1987) call referential modeling, and it has its problems. They recommend, instead, a 'strategic modeling' approach such as that used by Maryanski & Turner (1992) and Pryor (2003), in which humans are compared with all other primates.

Here I shall use, instead, a single primate clade or phylogenetic family, because I believe this will facilitate not only an efficient synchronic comparison of human traits that seem to be distinctive, but a natural-historical analysis of how they became that way.

## **2. An evolutionary definition of communal property**

It has been noted frequently that humans can form complex, populous societies with a high degree of internal interdependence and cooperation, as with early states like Mesopotamia. These involve intensive division of labor, taxation of the populace with significant benefits in return, support of privileged elites by masses, and extensive property ownership by 'the state'—all of which make us think of very strong analogies with social insects (see Campbell 1975, 1983, Wilson 1975).

I use the word 'analogy' advisedly. The social insects are in a position to accomplish their economic integration because there exists a complete or strong identity between the reproductive interests of cooperating individuals and their hive; in effect, the hive as a whole is a unit of selection (Campbell 1975, 1983). Furthermore, these insects cooperate in achieving communal interests by means of essentially hard-wired responses, which are relatively inflexible, rather than through the flexible, genetically prepared learning of group traditions.

Humans achieve similar ends by participating in social systems that are highly cooperative, and we similarly create communal property in spite of the fact that the cooperators are not closely related. We do this through social learning and social control, and we do it in spite of the fact that the strongest units of selection seem to be the individual (Lewontin 1970) and the family. If nuclear families serve as very significant units of genetic selection (Sober & Wilson 1998), entire social groups appear to be important units of *cultural* selection (Soltis et al. 1995) and

(as increasingly less disputed) units of genetic selection (see Wilson & Sober 1994, Boehm 1997, 1999, Sober & Wilson 1998, Bowles et al. 2003).

To properly determine what is distinctive about humans economically, the question must be posed at the level of homology rather than that of analogy. That is, we must compare ourselves with species that have a maximal likelihood of sharing not only our unusual corporate type of economic behaviors, but also the underlying psychosocial mechanisms that make them possible and the genes that underlie such mechanisms.

Social insects take us far afield in this respect, and this is expectable given the great expanse of time that has elapsed since we shared an ancestor. If we limit ourselves just to mammalian species, we can immediately take note of the naked mole rat (Sherman et al. 1991), the African species that is highly reminiscent of the social insects in its division of labor and overall 'communality'. Mole rats exhibit various selfless individual contributions to the common interest, but again individuals in these cooperative colonies share so many genes that the individual is not so significant as a unit of selection. Furthermore, the phylogenetic distance between humans and rodents is sufficient that an assumption of homoplasy is logical: we and they are likely to be accomplishing functionally similar ends by different 'mechanical' means. Thus, what might appear on the surface to be a product of genetic altruism amounts merely to nepotism.

If we move on to the social carnivores, there are some striking basic similarities between species like African wild dogs (e.g., Creel & Creel 2002), or wolves or lions, and humans who hunt and gather (Schaller & Lowther 1969)—or even humans who live in cooperative urban societies. All cooperate in acquiring and consuming food, and all are highly social. The degree to which social carnivore behavior is governed by social traditions has not been studied in the way that has been possible for the chimpanzee and other apes that use tools (e.g., McGrew 1992), but a significant role for such flexible mechanisms seems likely.

However, even if social carnivores were significantly 'cultural', these similarities of pattern could be instances of homoplasy, that is, of convergence with humans. To say the similarities were homologous, we would also have to identify similarities in the underlying behavior genes, and obviously there is substantial molecular distance between ourselves and these nonprimate species. Just as obviously, findings about behavior genes sufficient to facilitate specific cross-species comparisons will come only in the future; for now, all we can say is that we share significantly fewer genes with these species than with other primates, but that there are some suggestive similarities in group behavior.

If we are interested in establishing human economic distinctiveness on the firmest possible basis, the most definitive comparison would be with a species that phenotypically exhibits similarly communal behaviors, but also presents a strong case for the behaviors being similarly prepared at the molecular level. The obvious candidates would be great apes, and there are, potentially, three nested clades we could work with. The largest and oldest, five-species clade includes orangutans as an Asian species of great ape, but we can do much better than this.

Next comes the clade containing four large African primates: humans, gorillas, bonobos, and chimpanzees. We know, from DNA comparisons, that the four of us share a common ancestor only around 7 million years ago (Ruvolo et al. 1991). Better still, we also have the clade containing just humans, bonobos, and chimpanzees, with a shared ancestor as of about 5 million years ago, and here, the differences of DNA fall to the 1.6% level.

This is obviously the clade of choice because general similarities of DNA are so great. When we find a major behavior pattern that all three of these species share, the chances of its being homoplastic are very slight, even though, in theory, it seems possible that evolutionary convergences could take place within such a small and closely related clade.

Wrangham (1987) has experimented with ancestral reconstructions using the larger of these two African clades, the one containing humans, gorillas, chimpanzees and bonobos, and I have built upon this model (Boehm 1999). I have also worked with the smaller, more recent three-species African great ape clade mentioned above (Boehm 2000, 2002). We will turn to these behavioral reconstructions presently in detail, for they will provide the baseline for considering the evolution of behavior that has resulted in the rise of communal property as we know it today.

How sound is the reconstruction methodology used by Wrangham? Banks (2002) has discussed possibilities for using behavioral traits of living apes to set up great ape phylogenies, and she finds that for these last two clades—the two out of Africa—there is no reason to think that even the relatively flexible basic social behaviors of great apes and humans are more susceptible of homoplasy than are morphological traits (see also Di Fiore & Rendall 1994). Thus, wherever humans and the other African apes can be shown to share a behavior trait, there is every reason to believe that the behavioral similarities are based on similarities at the level of both genes and the physiological and psychological mechanisms that contribute more directly to their phenotypic expression. An example would be certain emotion/ facial expression relationships in humans and other primates discussed by Darwin (1865).

### **3. Deciding on an ancestor for comparison**

Wrangham (1987) christened the shared ancestor of humans, gorillas, chimpanzees, and bonobos the ‘Common Ancestor’, and his experimental reconstruction gives this ancestor the following basic social patterns, which are closely tied to reproductive success: it lived in social groups; there was female dispersion to other groups; the males stalked males of the same species. None of these traits tells us much about economics, aside from the fact that groups are necessary to have communal property.

To these basic patterns I later added: living in social dominance hierarchies which tended to produce alpha males; forming political coalitions to vie for

power; peacemaking conflict interventions by dominants; defense of 'resources' used within the group (Boehm 1999). Subsequently, I added a capacity to understand rules, and an ability to gang up in sizable groups to partially suppress unwanted behaviors in others, notably top males (Boehm 2000, 2002).

Do any of these behaviors provide us with precursors for economic behavior having to do with property? The answer is yes. In all four species, much of the dominance behavior takes place because of proprietary feelings about better feeding locations, so this would seem to be a precursor for private property. With respect to 'defense of resources' in humans, chimpanzees (Goodall 1986), and bonobos (Badrian & Badrian 1984), there is territorial group defense of home ranges and the resources they contain (see Wrangham & Peterson 1996), but in the case of gorillas there is only the defense of harems by individual silverbacks or silverbacks and their sons against rogue male interlopers (Fossey 1983), so we cannot make the case there for there being a precursor for *communal* property. Because of the lack of unanimity caused by gorillas, the 'Common Ancestor' did not have communal property in the form of group-defended natural resources.

The smaller clade consisting of bonobos, chimpanzees, and humans will be more useful for present purposes. By eliminating gorillas from the analysis one can add several important new behaviors in reconstructing a molecularly and cladistically defined ancestor that lived merely 5 million years ago. This ancestor, like the 'Common Ancestor' discussed above, is unrepresented so far in the fossil record, but there can be no doubt that this, too was an African ape. In the absence of fossil remains, there are good reasons to call this more recent ancestral ape either Ancestral *Homo* or Ancestral *Pan* (see Diamond 1992). Because an accepted convention has not yet been arrived at, I shall refer to this species descriptively as the *Pan-Homo* Ancestor, a term more precise than the previous nomenclature I have used, 'Pan-Human Ancestor' (Boehm 2000, 2002).

Wrangham's conservative rule for reconstruction was that only if all four descendant species shared a behavior, could it be confidently ascribed to their African ancestor. In working with the smaller and more recent, three-species African clade mentioned above, I added a second rule (Boehm 2000). If all three extant species share a behavior but one exhibits it in a much stronger form than another, we must go with the lowest common denominator, simply in the interest of keeping the reconstruction conservative.

We now have a clade and a methodology for using it to explain, in comparative and natural history terms, how humans acquired their economic distinctiveness in the area of property ownership. In working with this smaller clade, three additional behaviors can be added immediately to the Common-Ancestral repertoire, all of them of direct interest to the sphere of property relations. They are defense of territory, capture of other animals for meat, and sharing of meat.

However, before we can bring this reconstruction to bear on an evolutionary analysis, it will be necessary to give further definition to the types of property relations we are interested in here. We will also need to introduce mobile hunter-gatherers, as the human type we will be using in making our comparisons.

#### 4. Private versus communal property

In the late 1950s and early 1960s I spent considerable time in Yugoslavia, where Marxist theory found some unusual expressions at the practical level. In a socialist regime in which factories were being placed directly in the hands of workers who voted collectively on matters such as capital investment and wages, communal property was being created on a deliberate basis as an antidote to the 'state capitalism' ascribed to the Soviet Union.

In the same era the Serbian pastoralist tribe I studied in Yugoslav Montenegro (Boehm 1986, see also Boehm 1983) still had both family owned homesteads down in the valleys and communal lands up in the mountains, pastures which could be freely accessed by all the clans and families of the tribe. Both the worker-owned factories and these tribal land holdings as of 1964–1966 were examples of property being socially defined in terms of communal ownership and use by an entire group; in one case, a modern experiment and in the other an indigenous tradition that was many centuries old.

For the purposes of this discussion, anthropological common sense is sufficient to define the basic contrast between private and communal property. Private property ownership is unequivocal when a single person disposes of, feels proprietary about, and will defend a scarce resource from others, and when others acknowledge this person's culturally defined right of ownership. When a similarly proprietary relation involves an entire group's relationship to a scarce resource, we may speak of communal property. Inherent in this second concept is both an agreement that by cultural definition the scarce resource is 'everybody's', and a realistic understanding that selfish individuals may try to usurp the property of the group, and that the group membership may have to defend the scarce resource they own in common. This is an instance of the individualistic 'free-rider' problem (see Wilson 1975), found extensively in humans but not so expectable in social insects.

Inherent in this dynamic conceptualization of communal property and how it works is the fact that humans are a moral species, and that both types of property are *normatively* defined, indigenously. It is for this reason that principles of ownership are sanctioned by groups; in particular, it is social control that enables our essentially selfish and nepotistic species to maintain communal property in the face of individual and familial self-interest.

#### 5. Hunting bands as the human unit of comparison

The humans we will be comparing with the two other species in the *Pan-Homo* clade are living hunter-gatherers that can serve as reasonable proxies for Upper Paleolithic hunter-gatherers; this type was chosen for its usefulness to evolutionary analysis (see also Pryor 2003). Out of more than 300 hunter-gatherers that have been studied ethnographically (see Binford 2001), I have identified about 150 that can serve as such reasonable proxies (Boehm 2002). The basic criteria are that

they must be mobile rather than sedentary, that they be pure foragers, and that they not be involved in significant ways with agricultural or postagricultural people or practices.

Here are some features that seem to hold for all such people (Boehm 2002, see also Kelly 1995). First, they live in smallish bands composed of about half a dozen to several dozen families, not all of whom are related. Second, they are politically egalitarian in the sense that dominance and bossiness are not tolerated among heads of households. Third, they both hunt and gather, and whereas large game meat is shared band-wide, small game and plant foods tend to be shared only within the family.

It is generally agreed (see Lee 1970, Woodburn 1982, Erdal & Whiten 1994, Wiessner 1996) that what I believe amounts to the group's expropriation and distribution of large game has to be accomplished in spite of successful hunters' tendencies to be not only proprietary about the carcass they kill, but proud of their accomplishment and inclined to throw their weight around politically as a result. Bands have a variety of ways of transforming what is felt to be private property into communal property, which in one way or another transfer initial 'ownership' of the carcass from the successful hunter or hunters to someone not so involved in its capture. That person then presides over its distribution to other group members according to rules agreed upon by the group.

Involved are dynamics of social control: people in bands feel strongly about their meat-distribution systems and about large game carcasses being essentially communal property until they have been initially divided; they can become quite aggressive collectively if these norms are seriously violated (e.g., Turnbull 1961). Aside from a simple desire to share in a treasured type of food, hunter-gatherers have the intelligence to understand that it is better for everyone if band members all eat moderate amounts of high-quality fat and protein on a regular basis, rather than engaging in a 'feast or famine' consumption pattern with respect to large game meat.

Smith (1988) and Winterhalder (1986) have applied principles of behavioral ecology derived from studies of other animals to humans, to propose that what such systems accomplish is 'variance-reduction' in protein intake, and it would seem that, intuitively, the hunter-gatherers themselves understand the 'averaging' effects involved (e.g., Michael Alvard, personal communication). One piece of evidence for this (see Kelly 1995) is that readily obtained plant foods are shared within the family but are not shared among families in a band. Another is that small game is shared far less often than large game. Another is that when large game is easily obtainable by individual families and is very plentiful, the sharing system becomes latent (e.g., Binford 1978) until large game intake again becomes sporadic, as is normally the case. Another is that interfamilial meat-sharing systems also seem to become latent when extreme hardship hits, for then it does not make sense to contribute to a system of sharing that evens out only in the long run; indeed, it is short-term survival that becomes crucial (e.g., Laughlin & Brady 1978, Dirks 1980, see also Turnbull 1972 as a potentially flawed case history source).

Kelly (1995) discusses some of the social mechanisms that are used by mobile hunters to put variance reduction into practice, and the customs vary in cultural content even though they all have a similar apparent objective. This is to see that every family in the band gets a significant share of meat when it first arrives in the form of large carcasses. Significant shares are not necessarily equal. Often, the family of a hunter who kills large game keeps a somewhat larger proportion of the meat than it gives away to other families, and there also may be allowances made in favor of kin, while men may receive favored portions in comparison with women and children. However, the strong central tendency is that the successful hunter or hunters give away most of the meat to others, and expect others to reciprocate when they kill large game (Kelly 1995).

When it comes to seeing to it that meat is not preempted by the hunter who kills it, or by anyone else, hunter-gatherers have come up with a variety of ingenious customs. For instance, Kalahari foragers studied by Lee (1979) and Wiessner (1977) exchange arrows a lot, knowing that it is the owner of the arrow who 'owns' the meat before its distribution. This enables hunters to avoid suspicions of self-aggrandizement, and more generally it is a way of keeping the successful hunter from trying to regularly control the meat he kills, as opposed to having it widely shared within the band.

The one sharing system which demonstrates most graphically that these humans are designing their systems of exchange with 'averaging' of meat intake in mind, is that of the Netsilik Eskimos (Balicki 1970). When they live in normal-sized bands, the Netsilik have means of dividing meat that are similar to those of other hunter-gatherers. However, when they congregate in larger numbers on the sea ice to take seals, they have devised an arrangement that works as follows. Among unrelated families, there is a dense network of partnerships which ensure that seal meat is widely distributed, and the partnerships are based on body parts of the seal. A given hunter has different hunting partners for, respectively, the head, the fins, the tail, the stomach, and so forth, and when he kills a seal he gives that partner the appropriate body part and the partner will reciprocate in kind whenever he kills a seal. The result is a steady supply of seal meat for every family, rather than an occasional feast and then facing the possibility of bad luck and protracted malnutrition or even famine.

What these systems of long-term generalized exchange provide, is a means of averaging out the large-game meat intake for everyone in a band, and because individuals do not have the right to withdraw from the system and treat carcasses they have killed as private property, I have called large-game meat communal property. It is not communal property merely in name, for a typical band will fiercely enforce whatever system of initial meat distribution it has arrived at by using social pressure and, if necessary, dire sanctions (e.g., Turnbull 1961).

In a real sense, when push comes to shove this meat is presided over by the band as a whole—by all of its members who are united as a moral community intent on having their rules followed. They are united in supporting customary procedures for initial meat distributions not only because this has become their

group tradition, but also because they can predict the social disorganization and conflict that would result from the rules not being followed, and can also predict personal loss if they were to follow the rules and others did not. It is because of such motivations that large carcasses initially remain under the control of the group through its representative, who it is prepared to enforce the rules. And it is at that point that they must be considered to be communal property. That is my interpretation of the ethnographic accounts I have read.

#### **6. Exactly how communal is human foragers' meat-sharing?**

In formally defining 'cooperation' and 'community property' in hunter-gatherers, the issue of methodological individualism versus methodological collectivism (see Kelly 1995) is likely to arise. Thus, some analysts will tend to see a cooperative pattern as being merely an *apparent* effect, and will insist that what is really happening is that many individuals are pursuing their selfish individual interests and that somehow, perhaps through totally reciprocated 'altruism' over time (Trivers 1971), a selfishly based pattern of common benefit arises. Others look to emergent corporate properties of such systems, concentrate on them, and make assumptions that the individuals involved may be somewhat prone to cooperate but in the main are doing so in part because of pressure (see Alexander 1987) in the form of social control. In the past, still others have taken the idealized statements of natives much too literally, and have assumed that actual cooperation behavior is basically 'natural', that is, it is entirely voluntary and altruistic in its ultimate motivation.

I would place myself in both of the first two groups, but not in the third because the indigenously issued cues are merely idealistic statements. Nonliterate people do not often philosophize at length about such matters, even though they are constantly preaching in favor of cooperation and unselfishness (Boehm 2000). However, certain things are apparent from studies of their meat sharing. One assumption they make is that if hunters or teams of hunters have killed something big, they will get their egos involved because it is human to have 'alpha tendencies' (e.g., Lee 1979). Indeed, hunting bands are vigilant in holding down such tendencies whether they apply to feeling proprietary over large game carcasses and throwing one's weight around because of hunting success, or to other spheres of potential political dominance such as acting the bully (Boehm 1993, 1999).

With respect to meat, these tendencies toward self-aggrandizement could lead proud hunters to take most or all of the meat for themselves and their families, or distribute it mainly to favorites, or use it to increase their personal power over others. It is the band-wide distribution systems that hunting communities put in place, which keep these things from happening, and social control is important. Indeed, with respect to increasing personal power over others, bands have been known to execute despotically inclined individuals who somehow manage to achieve significant dominance over their fellow household heads (Boehm 1993).

Thus, there would appear to be some strong collective motivations that underlie egalitarianism in general and equalized meat-sharing practices in particular, and the existence of these forces helps to make the case that the meat at issue is being viewed as communal property.

In terms of theoretical approach, I definitely have 'collectivist' tendencies (see Boehm 2000, especially the critique by Donald Black). To my way of thinking, the entire band is taking over what otherwise would be private property of one or more successful hunters, and is treating it as group-wide communal property because everyone, including those not active in procuring the carcass, will insist on sharing in the commodity. An alternative model would see this all as a form of exchange, but in this case the model would have to be based just on individual self-interest, while the moral community component would be left out of the equation.

Bringing in emergent effects of moral communities acting as potentially aggressive coalitions of 'everyone' against selfish deviants, who would go against the will of the group, does not mean that this communal approach to initial meat sharing is either totally even-handed or uncomplicated by glitches. If one dissects the sharing process, it may be that after the first wave of sharing the originally communalized meat becomes private property, as with Kalahari foragers (e.g., Wiessner 1996), and as such it can be shared further on the basis of kin or in-law ties, shared opportunistically with trading partners, or whatever. Thus, large-game meat becomes communal property only at the critical juncture at which it initially becomes subject to the group's rules and is shared out by a representative of everybody rather than by the hunter who got the meat.

But what appears to be universal among the type of forager we are speaking of is that the *initial* sharing of a freshly acquired carcass is accomplished by the group's creating customs that turn what amounts to the potential private property of successful hunters into communal property that includes all currently resident band members. This is effected on a routinized basis by the group's having created rules for initial sharing, and if necessary by its being willing to use its authority as a moral community to back such rules.

To what extent do scholars who study hunter-gatherers agree with such a collectivist interpretation? Fortunately, Kelly (1995) has surveyed the field. Some analysts seem to feel that the notion of communal sharing has been 'overdone', and that hunter-gatherers actually fall along a continuum from communal to private property (e.g., Hayden 1981, Smith 1988). This applies to overall approaches to 'property', and in fact I would concur because such assessments are complicated by the existence of nonnomadic foragers like the well known Northwest Coast Kwakiutl and various California Indians who are sedentary. Unlike the mobile foragers we are considering here, these people can use physical storage to reduce variance in their family food supply, rather than using 'social storage' (O'Shea 1981) in the form of band-wide meat-sharing, so there is no pressing and obvious benefit to communalizing meat when it can be smoked and stored at a permanent location, or you can make it through the winter by eating acorns you have stored.

Among sedentary foragers sharing still takes place within families, and sometimes at the group level (see Kelly 1995), but for larger residential groupings sharing is optional, and it is not universal. Thus, among all foragers communal property exists *within* families in the form of food-sharing, but it is only among nomadic foragers who obtain their large game sporadically that such food is very predictably made to be communal at the band level.

If the result of intraband sharing is the communalization of one type of private property at a level higher than the household, this does not come ‘naturally’ given an individual nature that is not set up to decisively foster spontaneous and selfless sharing outside of the immediate or extended family. However, in spite of insistent demands (see Blurton-Jones 1981, Peterson 1993), complaints (e.g., Lee 1979), tendencies to cheat by hiding meat (Kelly 1995), and the fact that a number of groups give the hunter of the game or males in general the better or larger shares of meat (Kelly 1995), large game is basically being turned into communal property by a band whose members understand very well the collective prerogatives they share in, and are jealous of them.

## 7. The group as basic

We now begin the analysis proper, which is both comparative and evolutionary. An additional feature that the *Pan-Homo* Ancestor had but which was absent in the earlier ‘Common Ancestor’, is fission–fusion social groups. Chimpanzees have them, as do bonobos and human hunter–gatherers who are nomadic. Because ‘groups’ are essential to defining the corporate economic functions we are interested in, let us begin by briefly assessing Pryor’s (2003) treatment of factors that influence both human band size and foraging-party size in the two *Pan* species.

Why are there groups in the first place? In addition to the distribution of food sources, Pryor identifies some noneconomic factors, such as presence of estrous females or mating opportunities, but he does not mention the powerful magnet of social attraction, which acts in very basic ways on all three species. An objective way of measuring the effects of this attraction is through behaviors that bring adults into intimate and pleasurable contact, such as gossip (humans only) or grooming (all three species). Dunbar (1996) believes that the two behaviors were very closely connected in human evolution.

In my opinion, the central tendency of about 25 persons per human band (see Hayden 1981) is a compromise between people wanting plenty of company, and people wanting to forage efficiently because resources in any one place are limited and it is energetically costly to move camp when they are depleted. Pryor (2003) emphasizes that as a result of seasonal scarcities, even smallish bands are prone to break up temporarily into smaller foraging parties. However, such flexibility is not distinctively human.

Very similar tradeoffs determine overall community and subgroup sizes in the fission–fusion communities of bonobos and chimpanzees (see Goodall 1986, Kano

1992), so a similar pattern can be assumed ancestrally. The *Pan-Homo* Ancestor may be assumed to have been gregarious but socially adaptable to the distribution of natural resources: it was a community-living primate that was driven by a combination of social and economic needs, and it distributed itself over space on that basis. However, we cannot say that it had home bases because only humans collect daily to spend the night in one place.

As Pryor (2003) suggests, it was when humans began to use home bases that a distinctive type of demographic grouping arrived. And I believe that this, along with language, made it possible for communities to reach a moral consensus when deviance arose (see Boehm 2000). In extant bands, it is this capacity for reaching a moral consensus that enables bands to set up rules that, in effect, create communal property. And they can collectively gang up to enforce such rules because knowledge of deviance is shared by all. This sets apart humans from chimpanzees and bonobos, even though when the latter two are gathered together in large enough parties within their communities, sizable coalitions may crack down on over-aggressive males (Boehm 2000).

#### **8. Meat carcasses as ‘private property’**

What about the distribution of goods and services within such groups? Hunter-gatherers are famous for their cooperative sharing of large game, but are humans distinctive in this sphere? Both bonobos and chimpanzees take small to almost medium-sized game, and both also share the meat. So, therefore, did our shared ancestor.

Humans and chimpanzees hunt actively and often cooperatively, but the ancestor may not have done so because so far, bonobos do not seem to do this; they basically capture game when it presents itself (Kuroda 1984). However, bonobos are relatively little studied, they live in an environment that is so stable and plant-rich that hunting is not too important nutritionally, and the prey they take are readily caught by solo hunters.

Chimpanzees have been studied extensively at many field sites, and because of this we know their hunting and sharing cooperation is variable. In this connection, Boesch (1994a, 1994b, see also Boesch & Boesch 2000) has suggested that Tai Forest chimpanzees in West Africa cooperate intensively in going after colobus monkeys, whereas East African chimpanzees at Gombe do not. Boesch also believes that his Tai chimpanzees routinely share their meat very cooperatively, rewarding all the cooperators, whereas the Gombe chimpanzees share less routinely and mainly reward their allies (see also Stanford 1999). He ties these differences to differences in the forests, since West African forests have a higher and more continuous canopy that makes hunting more challenging and spurs cooperation. But he also suggests (Boesch 1994b, see also Boesch & Boesch 2000) that in general the Tai chimpanzees seem more cooperative in their sharing.

In watching numerous monkey hunts at Gombe, I would agree that basically the Gombe chimpanzees seem to be free-lancing much of the time (see also Stanford 1999), and culturally their meat-sharing afterwards is 'partisan' and noisy, with frequent squabbles among the beggars (e.g., Blurton-Jones 1991). However, I have also watched a pig hunt up close at Gombe, and in that case there seemed to be more signs of coordinated action, while the sharing afterwards seemed to be much more 'routine' than with the monkey hunts there. There have also been instances of non agonistic monkey sharing recorded at Gombe, for example when kills were in surfeit and sharing was spontaneous and immediate between the alpha male and his mother and sister (Jane Goodall, personal communication).

Obviously, it is well within the general chimpanzee potential both to hunt cooperatively and to share the meat afterwards, and do so variably according to local exigencies that may well be both ecological and group-traditional. Thus, hunting and sharing patterns are flexible, and whether due mainly to cultural drift, local inventiveness, or differing environments, they are instances of diverse group traditions (see McGrew 1982, Whiten et al. 1999).

Bonobos' failure to actively pursue the game they acquire may have to do with the chosen prey, since basically the small antelope they capture are hiding and are easily taken by a single bonobo, as are flying squirrels. But in any event, the bonobos' 'meat economy', like that of chimpanzees and humans, does involve individuals sharing meat with each other (Kano 1992, Kuroda 1984). Because adult gorillas neither eat animals nor share food among adults, we can therefore place this social advance as something new that was taking place by about 5 million years ago.

Thus, in terms of economic behavior human foragers are not distinctive in doling out meat—when it comes in sizable parcels that create pressures to share. However, the sharing of chimpanzees and bonobos is not reminiscent of communal approaches of humans; it involves individuals being proprietary about the carcasses they catch or come to control, and other individuals obtaining shares by supplication. This can be considered to be a special manifestation of the 'private property' orientations these species manifest all the time as they vie for prime feeding spots, but in this case a single tangible commodity is at issue, and the sharing is negotiated individually, in ways that are highly apparent to an ethologist.

What about sexual division of economic labor? With respect to hunting, when chimpanzee males and females go after prey the males are far in the lead, and sharing is normally by males doling out meat to males and also females, while bonobo game acquisition so far is by females and sharing is with other females. In humans, hunting of large game is mainly by males, but both males and females take small game and often it is shared only within the family—facts not mentioned by Pryor (2003). This makes it difficult to precisely assess the ancestor in this respect, for chimpanzees and humans share game with both sexes while bonobos apparently do not.

In chimpanzees meat is not shared even-handedly, even at Tai Forest. Higher rank leads to greater shares at both field sites, but again the bonobo data are not

detailed enough to allow any firm ancestral conclusion. One economically important thing that we do find, in all three species—and this holds true for the chimpanzees at both Gombe and Tai Forest—is that the possessor of the meat does tend to be *proprietary* about the meat involved. In chimpanzees and bonobos, this stance of entrenched possessiveness generally seems to be respected by others who desire a share, for in both apes, begging or soliciting, rather than aggression, is the mode of communication that triggers meat distribution once individual possession is well-established. These understandings about meat as a possession have obvious and important implications for explaining the origins of *private* property.

### 9. Egalitarianism, variance reduction, and private property

Hunter–gatherer egalitarianism presents a remarkable political difference between humans and the two apes. All three have innate hierarchical tendencies and also some resentment of being dominated (Boehm 1999), but humans are intelligent enough to define individual autonomy as an important political goal (Gardner 1991) and then actively, decisively, and generically suppress the alpha tendencies of stronger individuals as they relate to other heads of households in the band. They thereby create a society of essential political equals: no independent adult has the right to take the property of others by force, and no one is allowed to boss others around—not even the group’s leader if it has one (see Boehm 1993).

In his comparison of economic behaviors of humans and other primates, Pryor’s (2003) analysis does not take into account very much the political dynamics involved in hunter–gatherer egalitarianism, even though they have been widely discussed (e.g., Fried 1967, Lee 1970, Cashdan 1980, Woodburn 1982, Kaplan 1985, Kaplan & Hill 1985, Gardner 1991, Boehm 1993, 1999), and even though he does cite several of these sources. In my opinion these dynamics are important for both synchronic-comparative and natural–historical analysis.

Pryor discusses at length ‘variance reduction’ theory (Smith 1981, 1988, Winterhalder 1986, 2001, see also Testart 1987), as an important explanation for the ‘equalization’ of large-game meat distributions within human bands, but he does not fully engage with this behavior in terms of the rich comparative–economic interpretations that are possible with respect to property concepts. Pryor (2003, p. 123) does say that: ‘In many hunting and gathering societies the obligation to share is especially evident in hunting where the successful hunter must either turn over the meat to someone else for distribution or can keep the game but must share a large part of it (Testart 1987). Paralleled by the high frequency of begging, mooching, or scrounging of food, this suggests that in many of these societies, band rights to food are more important than individual ownership.’

The conclusions he draws from these facts are limited. Pryor continues (2003, p. 123): ‘This has some important implications: (i) individuals do not starve unless the entire band is starving; (ii) individuals have less incentive to work hard

at foraging; (iii) individuals are more likely to limit their needs and to accustom themselves to a lower standard of living.'

Pryor (2003, p. 117) also says: 'A key difference between human and nonhuman primates is that adult humans distribute a very much higher share of their food within the family.... In several rare cases, sufficient quantitative evidence is available to test empirically various theories of one-way and two-way exchange (e.g., Kaplan & Hill 1985).' He continues: 'In many nomadic foraging societies, the successful hunter generally obtains only a small part—sometimes none—of the large animal that he has killed; rather, the food is shared either among the hunting party or among the entire band (Hayden 1981).'

To sum this all up, even though Pryor discusses variance reduction extensively he indicates, finally, that his own preliminary research does not support the idea that variance reduction as a means of coping with an uncertain food supply motivates these meat-distribution behaviors. Nor does he really raise the issue of communal property, which is my focus here.

In fact, I believe that variance-reduction theory is critical to explaining why meat is so often shared on an obligatory, morally enforced basis through rules that apply to the initial apportionment of meat to band members after large game is killed. And I also believe that this social tradition stems basically from environmental uncertainties and limitations that make for sporadic, difficult to predict intake of large game, but that basically the pattern of sharing will persist even when environmental uncertainties are not very obvious or pressing. The reason is that large game is almost always unpredictable in its procurement, and that egalitarian political systems make it easy for the group to impose a system of sharing.

When human foragers share their meat, they do so not only because this is politically correct behavior for egalitarians, but because they understand on an economically rational, i.e., satisficing, basis (e.g., Simon 1956) that it is important nutritionally to reduce variance in meat intake and thereby avoid the feast-or-famine pattern that would afflict even the first families of hunting if they did not share with the rest of the band.

Thus, their indigenous 'theory' is very much like the human behavioral ecology experts' variance-reduction theories, cited earlier in the paper. This does not mean that there will not be attempts to hide meat; it is in the role of 'hungry group member' that people identify with their variance-reduction program, while in the role of 'original possessor of the meat' they may be inclined to cheat if the risks and penalties are not prohibitive.

When chimpanzees and bonobos share meat, it is implausible to make the case that they are thinking in anything like the explicit terms of humans, who can calculate that less meat for me right now means much more frequent meat-eating over the long run. These apes do seem to have some intuitive appreciation of long-term dyadic reciprocity, however, as in grooming or food exchanges in captivity (see Flack & de Waal 2000). But in nonhuman animals, when meat intake is 'averaged' by sharing, surely this takes place on a relatively short-sighted basis, as with the various social carnivores. Indeed, an advanced cognitive appreciation of

the overall process is not needed; surely, instinctual types of behavior have been evolved to support sharing, precisely because variance-reduction has been useful in the past to individual reproductive success.

This means that 'communal property' is not involved when individual apes allow others access to meat they control. In contrast, nonliterate humans know exactly what they are doing when (as consensus-seeking, moralistic groups) they take over kills made by one or several individuals, and distribute the meat evenhandedly to the band. At risk of repetition, I must emphasize that their conscious intention is to have a steady supply of fat and protein that will come to all of a band's families in smallish but frequent doses, rather than each selfish household having an extremely rare feast—and then experiencing a meat-famine that lasts for many months and adversely affects energy levels and health. The practice of variance reduction is based upon a conscious indigenous theory—it is the result of rational economic choice backed up by moral sanctioning. Other species must rely on their past evolutionary histories to arrive at such mechanisms.

Thus, Pryor's above-cited doubts about variance-reduction practices and their importance in coping with economic/environmental uncertainty are, in my opinion, not well founded. If a band practices variance reduction when meat is reasonably scarce and then sets it aside when meat is extremely plentiful, this tells us something about how its members are thinking, and about how they are coping. All large-package meat does not become communal property, but difficult-to-procure large-package meat does, and this is no coincidence.

The behaviors I have been describing demonstrate that nonliterate hunting nomads have invented the idea of communal property as opposed to private property—the roots of which are ancient. At the same time, they have created a group-wide nutritional security net based on intuitive mathematical insights into averaging. They do this even though there are major disparities of hunting success among the hunters of a single band (Kelly 1995), so bands in effect are taxing the 'rich' disproportionately to create a common good that feeds everyone about equally. To a degree, our Social Security System is founded on similar principles (see Wiessner 1982, 1996, 2002, Smith & Boyd 1990).

The *Pan-Homo* Ancestor did share its private meat, and statistically this did result in some degree of variance-reduction for individuals. And as I said above, there is no reason to doubt that on a dyadic basis, some relatively limited and intuitive 'tit for tat' insights could have been operative—as long as meat-givers were likely to share reciprocally with future meat-possessors (bonobo data are lacking). But hunter-gatherers' insights are explicit, they are far more comprehensive, and they lead to a very strong element of *group* proprietariness that was ancestrally lacking. Of assistance, in addition to insights about averaging, are their intuitive understandings of complex systems of exchange, their ability to predict how their own social systems work in terms of group political dynamics and social control, and their collective power as moral communities to conceive of how they want their life to be, and when and where they must apply sanctioning to keep things that way (Boehm 2000).

Let us translate all of this into economic terms. Among chimpanzees and bonobos, and with the *Pan-Homo* Ancestor, what we have is private property being shared with some of those who solicit it—even as the solicitors acknowledge the power of the possessor to control this property. In our two apes, this possessive behavior can be further elaborated by considering the better-researched chimpanzees.

In this species it is clear that meat possession is special if we compare it with the normal competition for resources, such as prime feeding spots in fruiting trees. There, higher rank leads to exclusive use on a straightforward ‘might makes right’ basis. In the case of meat, however, if a medium-ranking adult male makes the kill, those of higher rank may acknowledge his ‘ownership’ of the meat basically by begging, rather than employing threats or confiscating the meat by force. This contrasts with what they do if a female or an adolescent or low-ranking male makes the kill, in which case a high-ranking adult male predictably confiscates the meat and shares it out as though the kill were his own (Goodall 1986, see also Stanford 1999). It is these reciprocal understandings about who controls the meat that permit us to designate meat as private property in these contexts once a high-ranking individual is firmly in control of it. A similar ‘respect’ relationship also seems to hold for bonobos who capture meat (Kuroda 1984), but the bonobo data are far from being as adequate as those for chimpanzees.

Of course, property rights tend to depend on power, and when meat becomes private property in a chimpanzee or bonobo community, it probably is the likelihood that the possessor will fight for such a precious resource that leads another, would-be meat eater to supplicate rather than threaten (see Goodall 1986). In this context, it is of interest that even though male coalitions form in chimpanzees to routinely contest the alpha position, such coalitions are not reported to arise regularly, for the purpose of divesting the alpha male of meat he is presiding over.

Ultimately, power relationships are also important in creating communal property in human bands. When the entire band through its agent routinely presides over a new kill, it is willing to use its collective moral sanctioning power in case the proud hunter wishes to preside over and personally dispose of ‘his’ carcass, and the group can include physical force, if necessary, when its rules are broken seriously.

At 5 million years ago, then, ancestrally we have only private property that is being shared out selectively by individuals, within groups, under individual social pressure from those who solicit a share. In terms of actual physical possession, this shared property is meat, even though prime feeding spots also are taken over by using rank, in both chimpanzees and bonobos. Both species seem to be proprietary about the carcasses individuals control, as basically they eat them themselves but also share some or much of the meat. This can be considered an incipient version of private property, because others seem to be respecting their ownership—even though there are no morally enforced group norms to reinforce this respect.

Humans today have the same *tendencies* to privatize hunting success, but the universal respect for individual ownership that is found in hunting bands (e.g., Kelly 1995) can be set aside when all other families in the multi-family band form a moral coalition, routinely take over individual or joint large game kills when they are ready to be eaten, and, in effect, make the large game communal during the first wave of sharing—after which it reverts to being private property. In this respect, humans are distinctive in communalizing their meat, and later I shall comment on when this type of communal property was likely to have come into being.

#### 10. Economics, politics, and morals

In an important sense, the human rank and file are putting ‘politics’ to work in the service of ‘economics’, and vice versa. They are intent on keeping the males of the band politically equalized, and meat is a currency that can be transformed into political power so it, too, is to be more or less ‘equalized’. However, their rules about meat distribution also serve their economy very directly, because they also are creating communal property in order to better their subsistence. Everybody can gain from variance reduction.

Purely as a matter of economic practicality, you first need to neutralize your alphas, before this egalitarian type of economic distribution system can be made to work, or work without undue conflict (Whallon 1989, see also Boehm 1999). For the evolution of human economic systems, the result was an entirely new kind of communal property—and a new, collectivized way of doing business economically that had profound implications long after the agricultural revolution, as well as before it.

I believe that at the level of behavioral dispositions, a basic ‘motor’ driving the process was the dislike of being dominated, coupled with the capacity to form coalitions to keep in line even the most powerful males (Boehm 1999). There was also the perceptually obvious need to create rules to regulate large-game meat, and in my opinion it was this, along with dislike of being dominated, that first led humans to invent moral rules and social control (see Boehm 2000).

That is my hypothesis. If I am correct, then in looking for what is distinctively human it will be very difficult to view ‘economics’ separately from ‘politics’, or from ‘morals’ and ‘social control’. This general holistic principle is well recognized in Landa’s (1999) study of the various economic and ideological parameters that guide the behavior of Chinese merchants (see also Bowles & Gintis 1998, Landa & Wang 2001). Obviously, if one thinks in terms of the contrast between ‘maximizing’ versus ‘satisficing’ economic strategies (e.g., Ortiz 1967), satisficing strategies can easily include not just alternative economic variables, such as communally based variance reduction as opposed to selfish or nepotistic gluttonous feasting, but also social and cultural variables having to do with how a proper moral life is indigenously defined.

For instance, one important aspect of hunter–gatherer variance-reduction practices is to keep economic behavior consistent with indigenous ‘philosophical’ positions about the need for egalitarian relations among household heads in the band. Thus, the better hunters in a band are made to give over what they naturally feel to be private property (a large, sporadically obtained animal carcass) to a band that considers that same carcass to be communal property for a variety of reasons, practical, philosophical, and moral.

The moral component is salient. The successful hunters fear not only the vindictive wrath of the band, but the sting of ridicule that comes with it and the sense of shame that is predictable. In addition, they are drawn to a generous type of behavior that will bring them a good reputation (Alexander 1987) and concomitant social and economic advantages (Kaplan 1985, see also Hawkes 1991). There is also the fact that humans are evolved to internalize and conform to group customs (see Campbell 1975). And finally, in purely economic terms they understand perfectly well that as long as the system works equitably, they and their families will be exchanging a pattern of feast-or-famine for regular meat intake; improvements in health and endurance are the perceptually obvious results.

For one who has never read the hunter–gatherer literature, the political side of these complex dynamics is easiest to see in Lee’s (1979) descriptions of successful Kalahari hunters returning to camp. They all but grovel before their peers as they make it clear they are not about to brag about the meat they have killed—or to put on other potentially arrogant airs that would signal to their peers that they need to be put down, preemptively, before they become too big for their britches.

Thus, the transformation of private property into communal property involves world view and morals, as well as politics and variance-reduction economics. The prerequisite for the evolution of such an ‘egalitarian syndrome’ is that the group must gain definitive control over its alpha males, and in part this prerequisite was already being met 5 million years ago, because ancestral subordinate coalitions were whittling away at alpha power (Boehm 1999). That was a precursor for the more definitive type of egalitarianism that was needed in order to make freshly caught large game into communal property.

Although, I have suggested that both chimpanzees and bonobos do form coalitions that reduce the power of alphas through something like social control (Boehm 2000), they do so without symbolically expressed rules, without any preaching, and without anything like a sense of shame or conscience. Furthermore, the reduction of alpha-power is merely partial. Nonetheless, these two species do understand ‘rules’ in the sense that subordinates must routinely submit to powerful individuals, and also in the sense that those powerful individuals sometimes have to submit to subordinate coalitions that rebel against their rule. Basically, these rules are about who gets to politically dominate whom, but there are economic consequences, as well, for much of the apes’ social dominance behavior is about access to food resources.

Ancestral control over alphas was far from definitive, but for human evolutionary developments it was significant from the standpoint of preadaptation. It was the far more definitive human enactment of this pattern, that made it possible for

prehistoric bands to transform private property into communal property—and do so even when this private property was initially being presided over by the most able or powerful males in the group. This was a remarkable achievement in human evolution.

### **11. The evolution of ‘territorial property’ between groups**

Basic property rights, as I have anthropologically defined them, relate to people in groups and to how they collectively choose to define morally correct proprietary relations of individuals, families, or entire groups, to scarce resources. Some scarce resources are properly presided over by individuals, others by groups such as families or even by the group as a whole. Our sole evolutionary example so far has been large-game meat.

All three of our species and their ancestor are territorial, in the sense that hostile interactions take place between the males of different groups when they meet at the borders of their home ranges (see Stanford 1998). This pattern holds significantly for bonobos (Kano 1992), and more strongly for chimpanzees and humans (Wrangham & Peterson 1996). This might be seen as involving a kind of communal property, assuming that defense of natural resources either is the evolutionary cause of such behavior, or their defense is somehow on the minds of the defenders. However, deciding exactly why groups of apes are defending their frontiers is difficult (see Pryor 2003).

If it exists, I think a proprietary attitude toward group resources might be considered as a primitive type of communal property, in the sense that all the males in one territorial community show hostility to the males in another, and this happens to take place along the boundaries of their home ranges. It certainly is reasonable to think that natural resources, or perhaps mating opportunities, are being defended in some ultimate—and possibly in some proximate—sense. Whatever their ‘motivation’, these territorial encounters provide us with some evolutionary food for thought.

We already know that ancestral groups or subgroups sometimes ganged up against powerful individuals within the same community, and that this was a preadaptation that made it easier for moral communities to evolve since they are based on group sanctioning. It is possible that territorial coalition behavior might be considered as another political preadaptation for the communalization of large game meat that eventuated in the human line, which required that groups gang up not against groups, but against individuals. Because ganging-up behavior is essential to social control, territorial ganging up could have involved similar basic dispositions.

### **12. The evolution of communal property within groups**

The *Pan-Homo* Ancestor showed strong precursors for having some sense of private property, insofar as meat possession by certain individuals was respected.

This sense of property existed without the support of moralized norms and the preaching and sanctioning that attend them. As we have seen, this ancestor also exhibited sharing of private property at the individual level. If it had anything like communal property, this was only in a very primitive form that might be associated with territorial tensions.

The question is, how did band-wide meat sharing evolve as the first type of morally defined communal property? In later human evolution, it is clear that abrupt glacial cycles placed special stresses on human adaptive capacity, driving up brain size (see Potts 1996), and it is also clear that humans were surviving in increasingly cold environments, especially after archaic *Homo sapiens* phased in (see Klein 2002). Where winters are severe and of long duration, large game is very likely to become a crucial dietary staple, and it was in such changeable environments (see Potts 1996) that a rapid, culturally based response involving variance-reduction would have been adaptive (Winterhalder 2001, see also Stanford & Bunn 2001). A rapid response of this type would have depended upon dispositions to share, which were already present ancestrally, and upon a cognitive capacity to understand averaging effects. It is my hypothesis here (see also Boehm 2002) that some type of sharing of large game by entire groups began at latest with archaic *Homo sapiens*, and that by the Upper Paleolithic sharing systems were operating on basically the same sophisticated principles as today.

Modifying alpha roles in the direction of restraint would have been crucial to this development, and at least for the Upper Paleolithic we can reasonably assume that a firmly egalitarian regime was in place. This assumption is based on two very different types of inference.

First, among our one hundred and fifty extant foragers who fit the Upper Paleolithic profile a definitive suppression of alpha behaviors by egalitarian band members (e.g., Cashdan 1980, Gardner 1991, Boehm 1993) is very widespread today, and may well be universal (Boehm 2002). Because this behavioral pattern is unanimous among foragers whose habitats range from tropical forests to woodlands and tundras to seriously cold Arctic areas where gathering is almost negligible, it is not difficult to project similar general patterns back into the Upper Paleolithic because people back then were both anatomically and culturally modern, and because environments were spread over a similar range except for the Arctic extreme, even though they often were more changeable.

Second, it is difficult to imagine that Upper Paleolithic hunters, who endured very long and severe winters and focused their attention very heavily on large game, would have been able to *survive* those winters without living in bands with multiple hunters and without some radical means of variance reduction in family meat intake (see Winterhalder 2001). In turn, it is difficult to think of such practices being possible without some very extensive suppression of alpha male behavior (see Whallon 1989).

Thus, the origin of morally sanctioned communal property seems possible for archaic *Homo sapiens*, and extremely likely, indeed, for anatomically modern humans. One might logically assume that earlier this biocultural adaptation

developed along a continuum, escalating whenever hominids had to cope with climates in which plant foods became seasonally scarce. What we do know, is that the *Pan-Homo* Ancestor shared meat and that it ganged up against its alphas in certain contexts. Thus, it is conceivable that *Homo ergaster* was putting these potentialities to some new uses if it was beginning to live more by regular acquisition of and dependency upon large game.

As archaic *Homo sapiens* began to survive in colder environments (Klein 2002), still greater dependency upon large game could have driven the evolution of meat-sharing techniques to new levels of efficiency, in terms of brute survival of families and bands as economically interdependent units. Indeed, both cultural and genetic group selection could have been operative in this process. Obviously, very heavy seasonal meat dependencies that accompanied Upper Paleolithic glacial cycles, when Anatomically Modern Humans were living in truly cold environments, would have brought the communalization of meat to its highest point.

Today, it is of interest that making meat into communal property is all but universal among contemporary hunter-gatherers that fit our in many ways rather variable Upper Paleolithic profile, and that this practice has been continued both in desert societies in which meat comprises only about 20% of the diet, and in Arctic ones in which it is over 90% of what is eaten (see Kelly 1995). This is true in all niches inhabited by mobile pure foragers, who invariably seem to be egalitarian in their political life as well as in their treatment of large game.

### 13. The property transformation

Obviously, there are many correspondences between Pryor's (2003) comparison and mine. However, his reliance upon a very broadly based and static approach for his comparisons leads him to different and perhaps more generalized conclusions about what is essentially human in economic behavior. In working with just one small but carefully chosen clade I have arrived at a different main focus here, property rights, and in this context I have been able to propose an evolutionary transition from private to communal property.

Just as basically, I have emphasized two features of nomadic hunter-gatherers' life which I feel are absolutely fundamental to their social, political, and economic life. One feature is the political advances made by human foragers in the direction of political egalitarianism, which on the basis of climatically forced intensive hunting behavior (e.g., Potts 1996, Klein 2002, see also Stanford & Bunn 2001) we may assume was in full flower at least by the Upper Paleolithic (see Boehm 1999, 2002) as a political prerequisite for economically 'egalitarian' sharing practices. The other feature is morally based, group-instigated variance reduction, as a strategy that profoundly affected the distribution of scarce resources.

This correlates directly with large game hunting, and I must emphasize, here, that variance reduction practices were very likely to have been operating prehistorically (see Winterhalder 2001) as a necessary element for successful

cold-climate adaptations that only the human primate was able to manage. It is because these dimensions seem to be so closely inter-related, as they produce very efficient systems of subsistence cooperation, that elsewhere I have called the combination of large-game hunting, variance-reduction based meat sharing, and morally based political egalitarianism an 'egalitarian syndrome' (Boehm 1997).

#### 14. Conclusions

In the communalization of subsistence scarce resources, we have seen that the only creatures to closely parallel us, analogically, are a variety of social insects (Wilson 1975, Campbell 1983) and the naked mole rat (Sherman et al. 1991). We have also seen that social carnivores and chimpanzees and bonobos, whose 'corporate functions' are far less developed, do share meat, and that in the case of the apes we can rest reasonably assured that the basic capacity to share does not involve similarity by homoplasy. These parallels with our two closest African great ape species oblige me to specify more completely what is meant by communal property in humans.

Obviously, our human economic transformation was based on large-brained analytical thinking and the advantages of well-developed cultural traditions and language, which today involve our understanding of our own social and economic systems, especially as we inventively fine-tune or change our cultural practices. In this way, we achieved important corporate objectives while living in hunting bands.

Certain insects and naked mole rats have accomplished something similar basically by means of kin selection and genetic hard-wiring. Social carnivores and the two other apes also exhibit some corporate and sharing behaviors, as with forming coalitions and parceling out meat, but are doing so on a different basis insofar as kin selection would seem to explain only part of what is taking place with their sharing behavior, which can be with nonkin, and also because their genetic leashes (Wilson 1975) are so much longer.

With humans, the limits imposed by kin selection become less stringent, because social control has risen as a phenotypically expressed force that can *oblige* individuals to share with non-relatives in the same group (e.g., Boyd & Richerson 1992). This is the basis of communal property.

I rest my case on property relations here. However, I would like to say a few further words about the significance of this profound transition from the economics of private property to the economics of communal property, as a major and deliberate culturally based imposition on private property.

As the scale of our societies has increased at exponential rates, we have carried this transformation forward in the form of early civilized states and later empires having centralized taxation systems which always exploit but often offer safety nets to populaces under taxation. These patterns were continued in socialist and capitalist welfare states, and found expression also in corporate totalitarian states

of the 1930s. Marxism, as a whole philosophy, was centered, in a sense, on the basic transformation from private to communal property that I have described, and also on modern ideological tensions that seem suspiciously similar to those found in forager bands—whenever they routinely dispossess the ‘rich’—the most successful hunters—to serve the ‘masses’ in the form of the band’s families at large.

With respect to the future of social evolution in this area, there are some incipient attempts to make the entire planet we live on into communal property, and to impose a global moral order, the two being closely linked. However, world opinion is ferociously divided in the matter. In this respect, the sovereignty of nations may well be a greater impediment to communalization than was the sovereignty of individual hunters in egalitarian bands, whose private prerogatives were regularly and beneficially usurped by ‘the group’ during the Upper Paleolithic as large game became a communal property for all.

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