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THE EVOLUTIONARY ORIGINS OF PATRIARCHY

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This article argues that feminist analyses of patriarchy should be expanded to address the evolutionary basis of male motivation to control female sexuality. Evidence from other primates of male sexual coercion and female resistance to it indicates that the sexual conflicts of interest that underlie patriarchy predate the emergence of the human species. Humans, however, exhibit more extensive male dominance and male control of female sexuality than is shown by most other primates. Six hypotheses are proposed to explain how, over the course of human evolution, this unusual degree of gender inequality came about. This approach emphasizes behavioral flexibility, cross-cultural variability in the degree of patriarchy, and possibilities for future change.

KEY WORDS: Patriarchy; Male dominance; Sexual coercion; Human social evolution.

The purpose of this article is to demonstrate the usefulness of an evolutionary perspective for understanding the origins of patriarchy in the human species.¹ Feminist scholars have usually rejected any role for biology in the origins of patriarchy (e.g., Collier and Rosaldo 1981). As both a feminist and an evolutionary biologist, I will try to show

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that these two perspectives can be integrated and need not be in opposition.

Feminist theory and evolutionary theory are concerned with many of the same basic issues. Feminist theory focuses on issues of power: who has it, how they get it, how it is used, and what are its consequences. Evolutionary biology, as applied to social behavior, focuses on precisely these same issues (Gowaty 1992). Feminist analysis also focuses on sexuality and reproduction; in fact, many prominent feminist theorists argue that control of female sexuality lies at the heart of patriarchy (Lerner 1986; MacKinnon 1987). Evolutionary theory also focuses on sexuality and reproduction (e.g., Darwin 1871; Trivers 1972) and places these issues at the heart of its analysis. Thus, both evolutionary theory and feminist theory focus on power and sex.

An evolutionary approach to understanding the origins of patriarchy is valuable for two reasons. First, it goes one step further than conventional feminist analyses in searching for the origins of male motivation to gain power over females. That is, evolutionary theory not only considers *how* men exercise power over women, as feminist theory does, but also investigates the deeper question of *why* males want power over females in the first place, which feminists tend to take as a given.² Second, evolutionary theory explains why male power over women so often revolves around female sexuality. By addressing the question of the origins of male desire for control of female sexuality, evolutionary theory adds a new and important dimension to the analysis of patriarchy. It is critical to emphasize that the following analysis of patriarchy in no way implies that change is not possible. This evolutionary analysis, in other words, is entirely consistent with feminist politics.

The central thesis of this article is that the origins of patriarchy lie far back in time, long before the development of agriculture, civilization, capitalism, or other similarly recent (i.e., within the past 10,000 years or so) phenomena normally invoked by feminists to explain patriarchy (e.g., Lerner 1986). This argument rests on several interrelated points. First, I will briefly review some basic aspects of evolutionary theory, including reproductive differences between the sexes. Then I will go on to consider the evolutionary basis of conflicts of interest between females and males. To illustrate these conflicts of interest, I will focus on the behavior of other primates, exploring the interplay between power and sex in monkeys and apes, our closest living relatives. Finally, based on this nonhuman primate evidence, I will propose six interrelated factors that I believe underlie the origins of patriarchy in our own species. I will conclude by suggesting that patriarchy is the product of reproductive strategies typically shown by male primates, which in humans have undergone unusually effective elaboration.

The section headings, below, and the explications in italics that follow each one, constitute consecutive steps in my argument concerning the origins of patriarchy.

EVOLUTIONARY THEORY

Natural selection favors behaviors that promote individual reproductive success; however, evolutionary theory does not imply genetic determinism.

Evolutionary theory is based on Darwin's (1859) concept of natural selection, which, in modern form, states that genes associated with phenotypic characteristics (i.e., physical or behavioral traits) that increase individual reproductive success will tend to increase over many generations, simply because individuals who possess those genes will leave more descendants—and thus more copies of their genes—than those who do not. Natural selection is the process by which adaptations—phenotypic characteristics that help organisms to survive and reproduce—evolve.

It is important to emphasize, however, that although the gene is the unit of selection, the Darwinian theory of evolution does *not* imply that the development of phenotypic characteristics in individuals is determined by genes, with little scope for environmental input. This mistaken notion that adaptation (i.e., evolution by natural selection) implies genetic determinism stems from a widespread tendency to confuse evolutionary and developmental processes (Dawkins 1982). Evolutionary processes depend on differential selection of genes. However, the particular genes selected during evolution are favored *within the context of a particular environment* (where "environment" includes everything that influences development, both inside and outside the organism). The development of adaptive traits thus depends on particular gene-environment complexes (Gottlieb 1992), and all phenotypic characteristics are products of complex, gene-environment interaction.

The relationship between evolutionary and developmental processes may be made clearer by an example of artificial selection described by Gottlieb (1992). Tryon (1942) created "maze bright" and "maze dull" strains of rats by systematically breeding, in each generation, the rats that performed the best and worst on a standard maze test. After seven generations, the two strains produced scores in the maze test that did not overlap. Because Tryon had deliberately selected for good and poor performance, one might be tempted to think that maze performance, in this example, was "genetically determined." However, experiments performed by Cooper and Zubek (1958) proved that this was not the case. During Tryon's experiments (i.e., during the process of artificial selec-

tion), all rats were reared under similar, "normal" conditions. Cooper and Zubek reared members of both "maze bright" and "maze dull" strains under two new conditions: either an extremely enriched environment that provided abundant stimulation, or an extremely impoverished environment that reduced stimulation to a minimum (the "normal" rearing environment was intermediate between these extremes). All rats raised under enriched conditions, regardless of their genes, performed about as well as the "maze bright" rats reared "normally." And all rats raised under impoverished conditions, regardless of their genes, performed about as poorly as "maze dull" rats reared normally. These results show that the reliable expression of "traits" favored by selection depends on the developmental context (i.e., the environment) and not merely on the presence of particular genes. It also shows that adaptation (e.g., selection for good maze performance) does not imply genetic determinism (i.e., good maze performance depended not on genes alone, but on interaction during development between the favored genes and a particular rearing environment).

Elimination of the common misconception that adaptive explanations imply genetic determinism allows one to appreciate that, far from being "fixed" traits, many adaptations are exquisitely sensitive to environmental variation. Behavioral adaptations, in particular, often represent flexible responses to variable environments (West-Eberhard 1987). Humans are especially sensitive to both past experience and the present environment because natural selection favored the evolution of brains that specialize in flexible responsiveness to the extremely diverse and variable conditions in which humans live.

Consider an informative example discussed by Hrdy (1990). In a number of hierarchical societies around the world, high-status parents bias investment toward sons, either neglecting daughters or, in extreme cases, killing female infants. Evolutionary theorists have shown that parental bias in favor of sons occurs under particular environmental circumstances, that is, when high-status sons, on average, produce more children than do daughters (for example, in India; Dickemann 1979a). In contrast, biases in parental investment may favor females when daughters have better reproductive prospects than do sons (for example, among the Mukogodo of Kenya; Cronk 1989). In this example, the behavior in question—greater allocation of parental investment to sons or daughters—is adaptive in the evolutionary sense (i.e., it increases parental reproductive success), and yet which particular pattern of parental investment is shown depends entirely on environmental circumstances and, in this sense, is environmentally determined.

The idea that a behavior can be biologically adaptive yet environmentally determined is difficult to grasp because our intellectual culture

is so deeply permeated by erroneous and dichotomous ways of thinking about genes and behavior, nature and nurture (including the misconception discussed above) (Oyama 1985). Furthermore, many people incorrectly assume that to attribute an evolutionary explanation to a behavior is equivalent to concluding that the behavior is fixed and cannot be changed (Dawkins 1982). As Hrdy (1990) so clearly demonstrates, evolutionary analysis does not imply behavioral immutability. It is important to keep this point in mind with reference to the evolutionary analysis of patriarchy that follows. Toward the end of this article, I will return to the issue of behavioral flexibility.

EVOLUTION OF CONFLICT BETWEEN THE SEXES

Female and male mammals have different reproductive interests, and these interests often conflict. Males sometimes employ coercion to resolve conflicts in their favor.

Among mammals, sex differences in behavior stem from differences in the ways females and males reproduce (Trivers 1972). Because of their physiological commitment to internal gestation and lactation, female mammals must invest a tremendous amount of time and energy in each offspring in order to reproduce at all. Males, in contrast, can reproduce simply by fertilizing a female. Once fertilization occurs, the male can often proceed to fertilize additional females, without making any further commitment in time or energy to the offspring of the first female. Thus, for males more than females, reproductive success is limited by the number of matings with fertile partners. For females more than males, on the other hand, reproductive success is limited by the time and effort required to garner and transfer energy to offspring and to protect and care for them (Bateman 1948; Trivers 1972). Males therefore are usually more eager than females to mate at any time with any partner who may be fertile, whereas females are usually more careful than males to choose mates who seem likely to provide good genes, protection, parental care, or resources in addition to gametes (Alexander and Borgia 1979; Trivers 1972).

Male interest in mate quantity, combined with female interest in mate quality, creates a widespread conflict of interest between the sexes (Borgia 1979; Hammerstein and Parker 1987; Parker 1979). The conflict is mitigated when males court females by offering them the benefits females want from males, such as food, protection, or help in rearing young. These benefits are often costly in terms of male time and energy, however, and males can sometimes overcome female resistance to mating at lower cost to themselves by using force or the threat of

force—in other words, through sexual coercion (Smuts and Smuts 1993).

Sexual coercion and female resistance to it are important phenomena to examine in other animals because they are clear manifestations of conflicts between male and female interests, and the outcome of these particular struggles can tell us something about the balance of power between the sexes and how it varies under different circumstances. Below, I use information from a detailed review of sexual coercion in nonhuman primates (Smuts and Smuts 1993) to highlight similarities and differences between humans and other primates that may provide clues about the evolutionary origins of patriarchy.

Before going on, I must stress that the following analysis of sexual coercion leaves many aspects of male-female power relations unexplored. Investigations of how male and female animals exert power over one another are rare, and evolutionary biologists have not yet developed a clear theoretical framework for studying intersexual power relations.³ For these reasons, I limit my attention to male nonhuman primates' sexual coercion of females and the human equivalent, men's ability to control and constrain female sexuality, through force and other means. This focus on male control of female sexuality is consistent with an emphasis among evolutionary biologists on reproduction, and an emphasis among feminist anthropologists on how men dominate women sexually (e.g., Ortner 1981). I believe that this is an appropriate place to begin an analysis of patriarchy, but further investigation of power differences between male and female primates, human and nonhuman, is clearly warranted.

In many monkeys and apes, during the period when the female is in estrus, that is, when she is fertile and sexually receptive, she receives significantly more aggression from males, and often more wounds, than at times when she is not in estrus (Smuts and Smuts 1993). This evidence alone suggests a link between aggression and sex in nonhuman primates.

Rhesus macaques provide a clear example. These terrestrial monkeys live in large, multi-male, multi-female troops, and they have a distinct breeding season when most females come into estrus. Adult males are about 20% larger than adult females. In a recent study of female mate choice in a provisioned, free-ranging colony of rhesus in Puerto Rico, Manson (1994) found that females in estrus consistently approached peripheral and low-ranking males in order to mate with them. However, when a female associated with a low-ranking male, she was vulnerable to aggression by higher-ranking males, who tried to disrupt the pair by chasing or attacking the female rather than the low-ranking male. Manson found a direct, positive relationship between the amount

of time an estrous female spent with low-ranking males and the rate at which she received aggression from other males. But despite this risk, females persisted in their attempts to mate with the males of their choice.

Rhesus males attempt to control females mainly when the females are in estrus, and they show less aggression toward females at other times. But in some other species, males try to maintain control over females all the time. The best example is the hamadryas baboon, a large, ground-dwelling monkey, which lives in North Africa (Kummer 1968). Hamadryas baboons form small groups containing a single breeding male, several adult females, and their immature offspring. Several of these one-male units associate in larger units called bands, which also include a number of "bachelor" males without females of their own, who are eager to mate. Day in and day out, the breeding males persistently herd their females away from these bachelor males. When a female strays too far from her male, he threatens her by staring and raising his brows. If she does not respond instantly by moving toward him, he attacks her with a neckbite (Kummer 1968). The neckbite is usually symbolic—the male does not actually sink his teeth into her skin—but the threat of injury is clear.

In a wide variety of primates and in many other mammals, males use another coercive tactic to increase their access to mates: infanticide (Hausfater and Hrdy 1984). By killing the unweaned infants of females with whom they have never mated, males bring the females back into estrus sooner. If the infanticidal male succeeds in mating with the female and fathering her next offspring, then he has increased his own reproductive success at her expense. And, although it is counterintuitive, females often do subsequently mate with males that have killed their infants. Why? The evidence suggests that, at least in some cases, she mates with him because he is the strongest male around and is likely to most effectively protect her future infants from infanticide by another male.

Mountain gorillas provide a good example. These apes, like hamadryas baboons, live in small groups that usually include one breeding male, known as the "silverback," and several adult females and their young (Stewart and Harcourt 1987). Solitary, bachelor males periodically attack these family groups and try to kill infants and herd females away from their mates (Watts 1989). If a bachelor male succeeds in killing an infant, it means that the silverback was unable to protect his offspring. Sometimes, under these conditions, the mother abandons her mate to join the killer. More often, the silverback succeeds in protecting the infant. But if the silverback dies or is killed in a fight with another male, the females and their infants become extremely vulnerable to attacks by bachelors.

In nine of eleven known cases in which a female with an unweaned infant was left without male protection, her infant was killed. Most of these females subsequently bred with the male who killed the infant (Watts 1989).

As a final example of male coercion of females, consider wild chimpanzees, who along with bonobos or pygmy chimpanzees are our closest living relatives. Chimpanzees live in large communities with 8–20 adult males and many adult females and young (Goodall 1986; Nishida and Hiraiwa-Hasegawa 1987). Chimpanzee society is very fluid. Members of the same community join and leave small, temporary gatherings, or parties, whose composition is constantly changing. Relationships between males from different communities are hostile, but at adolescence, most females transfer from their natal community to another nearby community.

When a female chimpanzee undergoes sexual cycles (which happens for only a few months once every five years or so), the males in her group compete over opportunities to mate with her, especially as she nears ovulation, when her sexual swelling reaches its maximum size (Hasegawa and Hiraiwa-Hasegawa 1983; Tutin 1979). When many males are present, the most dominant, or alpha male, usually prevents any other males from mating with her. Lower-ranking males therefore try to lure estrous females into the forest, away from other chimps, where they can mate in peace. These secret assignations, called consortships, may last for several weeks (Goodall 1986; Tutin 1979). If the female is willing to go, as she sometimes is, then the pair simply sneaks away. But if the female is unwilling, the male will repeatedly perform aggressive displays around her in order to force her to follow him, and if she still does not follow, he will attack her. Goodall (1986), for example, describes one instance in which a male, Evered, attacked an estrous female, Winkle, six times in five hours, twice severely, while trying to establish a consortship with her. Goodall (1986) concludes that, unless a male chimpanzee is very old or ill, he can usually force an unwilling female to consort with him through such efforts.

These examples of male sexual coercion are compelling, and it is important not to gain the impression that the male always gets his way. Very often, he does not. This introduces the third point in my argument.

FEMALE RESISTANCE TO MALE COERCION

Female primates have several means of resisting and thwarting male coercion. Thus, in many primate societies, male control over female sexuality is limited, and in some primates, females seem to be entirely free of male sexual control.

Several examples illustrate the variety of ways in which female primates resist male coercion. In rhesus monkeys, discussed earlier, females form strong, life-long bonds with their female kin, and females cooperate to protect their female relatives against male aggression (e.g., Chapais 1981). This pattern of forming long-term bonds with female kin is common in many Old World monkeys, and in all of these "female-bonded" species (Wrangham 1980), females band together against males (Smuts 1987). Females are especially likely to cooperate with one another to defend infants against aggressive males. Females also prevent certain males from joining their groups and will sometimes drive males out of their groups, occasionally wounding or even killing them in the process.

Male aggression is constrained in female-bonded species not just because of the threat of female coalitions, but also because females in these groups hold considerable "king-making" power. In rhesus macaques and vervet monkeys, for example, a male's quest to achieve and maintain high dominance status is strongly influenced by the support of high-ranking females (Chapais 1983; Raleigh and McGuire 1989). The males' reliance on female support makes them reluctant to challenge dominant females. For instance, in one troop of rhesus monkeys, the observer never saw any high-ranking males show aggression toward the alpha female (Chapais 1983), and in vervet monkeys, high ranking females often refuse male copulation attempts, sometimes hitting the males to send them away, and the males simply give up (Keddy 1986).

Female primates also reduce their vulnerability to male aggression by forming long-term, friendly relationships with particular males. For instance, in the olive baboons that I studied for several years in Kenya, each adult female formed a long-term relationship, which I called "friendship," with one or two of the 18 adult males in the group (Smuts 1985). Friends traveled together, fed together, and slept together at night. They also frequently engaged in friendly interactions, like grooming and huddling. The male protected his female friend and her infant against aggression by other troop members, including other males. The female, in turn, often showed marked preferences for mating with her friends, willingly forming consortships with them and cooperating when they tried to mate. Her bond with one or two particular males reduced the amount of harassment she received from other males.

These examples indicate that, far from being helpless victims of male control, female primates typically have several means of resisting males and asserting their own interests. Thus, although male primates typically are larger than females, this does not mean that they always win when they have conflicts of interest with females. Their larger size is balanced by the fact that females cooperate against males, whereas

males seldom cooperate against females (Smuts and Smuts 1993). It is also balanced by the fact that females form long-term bonds with particular males who protect them, and by the fact that, in many species, females have "king-making" power, which constrains male use of force against them. Note that all of these ways in which females resist or prevent male coercion involve supportive social relationships, sometimes with other females, sometimes with males, and sometimes with both.

In addition, in a number of primate species male coercion of females is rarely, if ever, observed. These include most of the monogamous primates (such as titi monkeys, gibbons, and siamangs), in which males and females are the same size, and also some species that live in multi-female, multi-male groups such as the New World woolly spider monkey (Strier 1992) and the pygmy chimpanzee, or bonobo (see below). Why male aggression toward females is so low in these species remains an important question for future investigation (Smuts and Smuts 1993).

In summary, in many primate societies, females are able to resist and thwart male attempts to control them sexually, and in several other primates, males rarely try to coerce females. However, in a few species, females appear to be unusually vulnerable to male coercion. This evidence suggests that the extent of male power over females varies widely across different primates. Before considering nonhuman primates further, I will draw our own species into this discussion, which brings me to the fourth step in my argument.

ORIGINS OF PATRIARCHY

Many human societies appear to involve greater male control over female sexuality than is typical of most nonhuman primates, and in contrast to males in most nonhuman primate societies, human males tend to control both resources and political power. Why?

Although anthropologists disagree as to whether male dominance over women characterizes all human societies (depending, in part, on their definitions of male dominance), many feminist anthropologists consider male dominance to be universal (e.g., Ortner and Whitehead 1981). Males are not universally dominant among nonhuman primates, and even in species in which individual males dominate individual females, male control over female sexuality and other aspects of female behavior is usually quite limited (Smuts 1987). For example, with rare exceptions, male nonhuman primates do not often control female movements, or the resources females depend upon for survival and reproduction. Why do many human societies show a more extreme pattern of male domination of females than is characteristic of most other primates?

To address this question, I will begin by asking, under what conditions are female nonhuman primates most vulnerable to male coercion? A survey of the primate literature suggests that one important factor underlying female vulnerability to males is reduced availability of social support from relatives and friends (Smuts and Smuts 1993). Consider first our closest living relatives, the great apes: the orangutan, gorilla, and two species of chimpanzees.

I have already mentioned common chimpanzees, among whom male sexual coercion is common, and gorillas, among whom male infanticide is common. Orangutans provide an even more striking example of male sexual coercion: they are the only nonhuman primate in which forced copulations appear to be the rule, rather than a very rare exception. In orangutans, virtually all matings by sub-adult males, and about half of the matings by adult males, occur after a prolonged and sometimes brutal struggle in which the much larger male forces the female to submit (Mitani 1985).

What is it about these great ape females that makes them so vulnerable to male coercion? Two factors, in combination, appear to be particularly important. First, in contrast to most other primates, female apes disperse away from the place they were born and thus, as adults, they usually do not have relatives around to help protect them. Second, in contrast to most other primates, who travel in cohesive groups so that females are nearly always in the presence of several other individuals of the same species, female apes sometimes travel entirely alone except for their dependent young. The degree to which females are solitary varies among ape species. Orangutan females travel alone with their most recent infant nearly all the time (Rodman and Mitani 1987). Interestingly, they are also apparently the most vulnerable to sexual coercion. Female chimpanzees spend up to 75% of their time alone with their young offspring (Wrangham and Smuts 1980), and, according to Goodall (1986), females are more vulnerable to male sexual coercion when no other males are around to protect them. Gorilla females spend most of their time in groups, where they are protected by the silverback male. But when he dies or is killed by another male, the females disperse and travel alone with their offspring. It is during this solitary period that they are most vulnerable to infanticide (Watts 1989).

The fourth great ape, the bonobo or pygmy chimpanzee, provides an interesting contrast that indirectly supports the hypothesis that a reduction in social support increases female vulnerability to male coercion. This shy, elusive ape has been studied in the wild only very recently. Along with common chimpanzees, they are our closest living relatives. Like common chimpanzees, they live in large multi-female, multi-male communities, and like common chimpanzees, female bonobos disperse

from their natal communities and transfer to another community as adolescents (Nishida and Hiraiwa-Hasegawa 1987). But unlike female chimpanzees, female bonobos spend most of their time in the company of other females (Kuroda 1979; White and Burgman 1990). Although the females in a community are usually not related, because they have transferred in from other communities, they nevertheless develop close bonds with other females, which are maintained through frequent homosexual activity. Field studies of bonobos indicate extremely low rates of male aggression toward females, frequent female-female coalitions against males, and a complete absence of male sexual coercion (Kano 1992). Thus, among bonobos, it appears that strong female-female bonds thwart sexual coercion (Smuts and Smuts 1993).

The hamadryas baboon provides one more piece of evidence in support of the idea that female vulnerability to sexual coercion is influenced by the presence or absence of support from other individuals. In nearly all of the other Old World monkeys belonging to this family (Cercopithecinae) females remain with their female relatives all their lives, but hamadryas baboon females disperse from their kin, like female apes (Stammbach 1987). I described earlier how hamadryas males constrain female movements not only when the female is in estrus, but all of the time. Hans Kummer performed some intriguing experiments in the wild that were documented on film (Kummer 1975). He trapped some female olive baboons and released them into a hamadryas band. Olive baboons are typical cercopithecine monkeys, and females remain in their natal groups, form strong bonds with their kin, and move freely throughout the troop (Ransom 1981). What happened when these "liberated" females were released into a very different social system? Immediately, each female was "claimed" by a hamadryas male, who tried to herd her with threats and neckbites. At first, the olive baboon females simply ran away from threatening males, as they would do in their own group. But within half an hour, after having been bitten several times, each female learned that the hamadryas male's aggression meant "stay with me," and she began to follow the male and remain very close to him, as do typical hamadryas females. This example indicates how quickly a female baboon, deprived of her network of relatives and friends, will learn to submit to a male who punishes her for independence.

This evidence from nonhuman primates leads to the first of four hypotheses regarding several factors that I believe account for the evolution of patriarchy:

Hypothesis 1. Among ancestral hominids, female ability to resist male aggression was compromised by reduced social support from kin and female allies.

According to ethnographic surveys, the majority of traditional human

societies show patrilocal residence (Ember 1978; Murdock 1967; Rodseth, Wrangham et al. 1991), which means that modern humans show the typical great ape pattern of female dispersal away from kin (although there are important exceptions).⁴ This pattern of female dispersal is particularly significant when it is remembered that the opposite pattern holds in many other primates and mammals in general (Greenwood 1980; Pusey and Packer 1987). In addition, among humans, as in chimpanzees, gorillas, and orangutans, female-female coalitions are relatively weak compared with those formed in many female-bonded primates. This tends to be the case even when women do not disperse from their natal groups (Rodseth, Smuts et al. 1991; Rodseth, Wrangham et al. 1991). The reasons for great ape females' dispersal from kin and the rarity of female-female coalitions (with the exception of bonobos) apparently relate to ecological factors (Wrangham 1979). Why women often disperse away from kin and why they rarely form effective coalitions against men remain unknown. Whatever the ultimate (evolutionary) reasons for these characteristics, what is significant for our purposes is that, both in other primates and in our own species, female dispersal away from kin and weak female-female coalitions tend to reduce women's ability to resist male aggression (Smuts and Smuts 1993).

Hypothesis 2. Over the course of human evolution, male-male alliances became increasingly well-developed. These alliances were often directed against females, and they increased male power over females.

Several people have recently argued that during human social evolution, male reproductive strategies came to rely increasingly upon alliances with other males (Foley 1989; Ghiglieri 1989; Wrangham 1987). This idea derives from two observations. First, among our close relative, the chimpanzee, male-male alliances are more elaborate than in any other nonhuman primate. Second, in the majority of modern human societies, male-male alliances are of central political significance (Bailey and Aunger 1989; Irons 1979; Paige and Paige 1981; Rodseth, Smuts et al. 1991; Rodseth, Wrangham et al. 1991).

The chimpanzee pattern of male alliances shows some striking similarities to what goes on in many human societies. In chimpanzees, males always remain in their natal communities and thus grow up among male relatives. As adults, males form long-term alliances with one another, and they use these alliances to compete for status and privileges within the group (Goodall 1986; Nishida 1983). In the wild and in large captive groups, observers have witnessed several prolonged power struggles among group males over the alpha position. These power struggles always involve complex and shifting alliances that bear striking resemblance to human political maneuvering (de Waal 1982). In

nearly every case, the male who won and maintained alpha status did so with the aid of alliances with other males.

In wild chimpanzees, males also form alliances with all of the other males in their own community against males from other communities (Goodall 1986; Nishida et al. 1985). At Gombe, Goodall's team has repeatedly witnessed organized raids by males from one community against another. Solitary males and mature mothers from other groups are brutally attacked, and sometimes killed, during these raids (Goodall 1986).

These attacks by males on strange females from other communities typically involve allied males cooperating against a single female (Goodall 1986). Within the community, also, chimpanzee males sometimes gang up on females. Male bottlenose dolphins (Connor et al. 1992) and lions (Packer and Pusey 1983) also show cooperative aggression against females. Observations of these three species suggest that, when males form stable alliances with one another against other males, they will also use these alliances to try to coerce females. Once this occurs, female resistance to male coercion is much more difficult, because the female faces several allied males rather than a single aggressor. In species in which males are larger than females, as long as the allied males outnumber the allied females, the males will have the advantage in any encounter involving force. This means that one of the primary means of female resistance to male coercion—alliances with other females against males—is no longer as effective.

It is critical to emphasize that male-male alliances against females are extremely rare among mammals, and when they do occur, as in the species mentioned above, they are rudimentary. The same males that cooperate against females typically also compete among themselves for sexual access to females, and this competition, plus cognitive limitations, constrains the ability of allied males to consolidate their power systematically against other males and, by implication, against females. During human evolution, in contrast, males developed the ability to control male-male competition within the group, presumably in order to improve their ability to compete against males from other groups (Alexander 1987). This critical evolutionary step not only increased the role male coalitions played in male-male competition but also increased male ability to control females.

Many instances come to mind of males cooperating with one another against females, including abduction and rape of women from other groups during tribal raids (e.g., Chagnon 1983) and instances of gang rape within groups (e.g., Gelber 1986; Murphy and Murphy 1985). Less obvious but equally important are cultural norms that reflect male-male cooperation to enforce sanctions that help men control female sexuality,

such as the widespread legitimization of acquaintance rape (Koss et al. 1987) and of wife-beating in response to female adultery (Counts et al. 1992; Daly and Wilson 1988; Smuts 1992). In many instances, however, men cooperate to maintain control over women without necessarily resorting to brute force; a prime example concerns marriage systems based on exchanges of women among men residing in different groups (Levi-Strauss 1969; Rubin 1975). Physical coercion of women is not always required, because other, less costly means of control are often just as effective. This brings me to the third hypothesis for the evolution of patriarchy.

Hypothesis 3. Over the course of human evolution, and particularly since the advent of agriculture and animal husbandry, males gained control over resources that females need to survive and reproduce. This increased male ability to control and coerce females.

Because all human economies involve some form of resource sharing, we tend to take this aspect of human life for granted. However, it is important to realize that humans are unique among primates in this regard. In all other primates, once individuals are weaned, they are entirely responsible for feeding themselves and do not rely on others for resources. It is true that food-sharing—and especially sharing of meat—occurs occasionally in chimpanzees, but individuals do not rely on sharing for more than a small fraction of their food (Teleki 1981). Thus, in all other primates, females rely on their own efforts to obtain food and do not depend on males for resources.

We know that at some point during human evolution, our ancestors shifted from an omnivorous diet based on individual foraging to a diet that included more meat, more extensive food-sharing, and a sexual division of labor. It seems very likely that from the start, males did most of the hunting, as they do among chimpanzees and among human foragers today (Hill 1982). Once a shift toward meat-eating and food-sharing occurred, the stage was set for increased male control over females, via male control over meat. This may not seem inevitable—after all, food-sharing alone would not necessarily increase male power over females, since to the extent that males needed food gathered by females, females might have as much power as did males. However, if male control over females was already underway prior to the evolution of hunting, then the food-sharing system could be incorporated into sexual politics in a way that increased male control. I suggest that male-male alliances and male control over resources interacted in a positive feedback loop over the course of human evolution. The prior existence of male cooperation for political and reproductive goals probably facilitated male cooperation in hunting and in controlling the results of the

hunt. The possibility of controlling resources, in turn, probably increased the benefits to males of forming alliances with other males, so these alliances grew stronger over time.⁵

Nevertheless, it is likely that the important female contribution to subsistence in most foraging and simple farming economies (Schlegel and Barry 1986) allowed females to retain some economic power and placed limits on male control over women. However, with the advent of intensive agriculture and animal husbandry, women, by-and-large, lost control over the fruits of their labors (Lerner 1986; Sacks 1975; Schlegel and Barry 1986). Foraging and nomadic slash-and-burn horticulture require vast areas of land and mobile females, making it more difficult for men to control women's resource base and to restrict women's movements. However, when women's labor is restricted to a relatively small plot of land, as in intensive agriculture, or is restricted primarily to the household compound, as in animal husbandry, it is easier for men to control both the resource-base upon which women depend for subsistence and women's daily movements.

Female dependence on men for resources increased their vulnerability to male domination for three reasons. First, as noted above, when women's work became concentrated in a small area, it became easier for men to monitor and guard their movements and activities. Second, the more resources men invest in their mates and their mates' children, the more concerned men become to ensure that the offspring in which they are investing are their own, which increases their motivation to control female sexuality (Dickemann 1981). Third, as women's dependence on men for resources increases, resistance to male domination becomes increasingly costly, because women are unlikely to be able to acquire sufficient resources for themselves or their children without male support (e.g., Irons 1983; Lateef 1990).

Men recognize the intimate connection between their ability to control women and female economic dependence on men. For example, in West Africa, men equate loss of economic control over women traders with loss of sexual control over women (Clark 1988:8). In addition, cross-cultural analyses generally support the hypothesis that male control of resources makes women more vulnerable to male aggression. Schlegel and Barry (1986), for example, reported a statistically significant cross-cultural association between reduced female contribution to subsistence and increased frequency of rape. However, it is important to note that women's contribution to subsistence is unlikely to be the best measure of male control of resources, since women may work very hard but still not control the fruits of their labors (Friedl 1975). Levinson (1989) reported a more germane result: across cultures, there is a statistically significant positive association between the degree of male

control over the products of family labor and the frequency of wife-beating.

In societies in which men control resources, some men often have much more than others. This brings us to the fourth hypothesis for the evolution of patriarchy.

Hypothesis 4. Over the course of evolution, male sociopolitical arrangements increased the variance in male wealth and power and perpetuated family differentials across generations. As a result of increasingly unequal relationships among men, women became increasingly vulnerable to the will and whims of the few most powerful men, and women's control over their own sexuality was greatly reduced.

Scholars have repeatedly noted a positive association between the degree to which male-male relations are organized along hierarchical principles and the extent to which women are controlled and dominated by men (e.g., Betzig 1986, 1993; Dickemann 1979b, 1981; Lerner 1986). An evolutionary perspective can help to make sense out of this relationship (Betzig 1993; Dickemann 1979b, 1981; Smuts 1992; Smuts and Smuts 1993). In any gregarious species, male attempts to dominate and control females are likely to be successful only to the extent that males can also dominate and control other males. If no male is capable of dominating any other male (an idealized situation only approximated in nature), then coercing females into mating will not work because other males will always have the power to intervene, and they will do so because intervention will simultaneously reduce a rival's reproductive success and increase the intervener's own chances of gaining sexual access to the female. Thus, the coercive strategy will be unstable, and the most reproductively successful males will be those who compete by providing females with benefits that lead the females to voluntarily choose them as mates.

In contrast, to the extent that some males in an animal society dominate others, the more dominant males can adopt a coercive mating strategy with less interference from other, less powerful males. Among humans, as variance in male power increases, it becomes increasingly possible for the males at the very top to use their power to exclude other males and monopolize control over females, resulting in extreme polygyny among the elites and a shortage of mates among men at the bottom of the hierarchy (e.g., Betzig 1992, 1993). Simultaneously, the alternative male strategy of providing females with benefits (e.g., Strassman 1981; Smuts and Gubernick 1992) becomes increasingly ineffective, both because subordinate males experience a reduced capacity to provide females with benefits (especially material ones) and because female ability to choose mates freely is constrained by the actions of dominant

males. Thus, the degree to which men dominate women and control their sexuality is inextricably intertwined with the degree to which some men dominate others (Betzig 1986; Smuts 1992).

The two features considered in hypotheses 3 and 4, male control of resources and male potential for polygyny, have important implications for female reproductive strategies. This brings us to the fifth hypothesis for the evolution of patriarchy.

Hypothesis 5. In pursuing their material and reproductive interests, women often engage in behaviors that promote male resource control and male control over female sexuality. Thus, women as well as men contribute to the perpetuation of patriarchy.

As Hrdy (1981) pointed out, it is not always in a female's reproductive interests to ally with other females against males. Often, females do better by competing with other females and/or allying with males. Among humans, such female strategies can reinforce patriarchy.

Buss (1989, 1994), for example, has shown that, the world over, women express a preference for marrying men with more resources; this preference is consistent with the importance of resources to female reproductive success. Buss argues that women's preference for resource-rich men reinforces male-male competition for resources and thereby contributes to male resource control. In polygynous, stratified societies, women increase their chances of marrying rich men by behaving in ways that increase paternity certainty, including compliance with customs designed to control female sexuality, such as claustration, purdah, and infibulation (Dickemann 1979b, 1981). Both women and men benefit reproductively when their female kin are able to marry rich, polygynous men because women married to rich men tend to produce polygynous sons (Betzig 1993:64). This may help to explain why women in such societies often actively support customs that control female sexuality and insist on their daughters' compliance (Jeffrey 1979).

Women also support patriarchy by favoring sons over daughters and brothers over sisters. As mentioned earlier, in societies characterized by social stratification and polygyny, parents at the top of the hierarchy bias material investment toward sons (Betzig 1993; Dickemann 1979a; Hartung 1982; Hrdy 1990) because rich parents can expect to produce more grandchildren through sons than through daughters (Trivers and Willard 1973). Betzig (personal communication) points out that female kin (mothers, sisters) benefit reproductively from biased investment in polygynous sons just as much as do male kin, and the wives and daughters of rich men are therefore expected to support male-biased inheritance patterns.

I have now hypothesized five critical features in the evolution of

patriarchy, in their expected chronological order (although the fifth one could apply at any point in the sequence): (1) female dispersal and the absence of strong female-female coalitions reduced female ability to recruit effective allies (kin and other females) against male aggression; (2) increasing elaboration of male-male alliances enhanced male power to coerce and control females; (3) increasing male control of resources helped consolidate male domination over females; (4) increasingly hierarchical male-male relationships enhanced the ability of the most powerful men to coerce and control women (and other men); and (5) female reproductive strategies often supported aspects of patriarchy. I will now briefly touch upon a sixth factor that must have played a critical role in the evolution of patriarchy: language.

Hypothesis 6. The evolution of the capacity for language allowed males to consolidate and increase their control over females because it enabled the creation and propagation of ideologies of male dominance/female subordination and male supremacy/female inferiority.

Because we do not know when human language evolved, it is not clear at what point in the chronology outlined above this critical event occurred. Once the capacity for language evolved, it probably greatly facilitated further development of male-male alliances, male control of resources, and the development of hierarchical relationships among men by making it easier for men to communicate more directly and clearly about potential alliance formation and the uses to which such alliances could be put. In addition, once language evolved, humans could begin to develop and promulgate views of society that supported their own interests—in other words, ideologies were born. Based on the series of events hypothesized above, it seems likely that gender ideologies—views of society that justified male dominance over women—were among the first ideologies ever invented.

Scholars have provided ample documentation of the ways in which gender ideologies both reflect and help to sustain male domination over women (e.g., Abu-Lughod 1986; Daly 1978; Gregor 1990; Lerner 1986; Murphy and Murphy 1985), and I will simply take this as a given here. The point I wish to stress is that men's use of language and ideology to keep women down is not a departure from pre-linguistic forms of male control but, rather, a natural extension and elaboration of those forms. If male chimpanzees could talk, they would probably develop rudimentary myths and rituals that increased male political solidarity and control over females and that decreased female tendencies toward autonomy and rebellion. Thus, although the capacity to use language to reinforce their power is unique to human males, the male motivation to use whatever means are available—social, material, cognitive—to increase control

over females antedates the evolution of the human species by millions of years. And, in line with hypothesis 5, women sometimes help perpetuate ideologies that support patriarchy (Smuts 1992).

To summarize these hypotheses, six factors influenced the evolution of human gender inequality:

1. a reduction in female allies
2. elaboration of male-male alliances
3. increased male control over resources
4. increased hierarchy formation among men
5. female strategies that reinforce male control over females
6. the evolution of language and its power to create ideology

This analysis suggests that patriarchy is a product of reproductive strategies typically shown by male (and, to a lesser extent, female) primates, which in humans have undergone unusually effective elaboration. The roots of patriarchy lie in our prehuman past, but many of the forms it takes reflect uniquely human behaviors.

THE FUTURE OF PATRIARCHY

This evolutionary analysis does not imply that patriarchy is inevitable, because humans have evolved the capacity to express a wide range of possible behaviors.

Does this analysis imply that our species is doomed to a patriarchal future? I believe that the answer is no, for the following reasons.

In this article, I have tried to imagine how our ancestors made the journey from a prehominid, apelike ancestor characterized by limited and specific forms of male control over females to the modern human condition in which most, if not all, societies are characterized by pervasive male dominance. Because my goal was a general account of this long journey, I have, for heuristic reasons, described hypothesized trends in hominid and human social evolution as if they represented a single, smooth, linear trajectory. From what we know about both humans and other animals, however, this scenario must entail a rather serious oversimplification. In recent years behavioral ecologists have demonstrated that animal societies vary in response to differences in resource base and demography (e.g., Emlen and Oring 1977; Wrangham 1979, 1980). Because of evolved capacities to respond flexibly to environmental variation, the same (or very closely related) species living in different habitats may show dramatic differences in social relationships.⁶ Clearly, the capacity to modify behavior facultatively depending on con-

text reaches its apex in humans, who show a greater range of variation in social relationships than any other animal (Rodseth, Wrangham et al. 1991). Thus, the trends that I hypothesized above would, at any point in time, more accurately describe the midpoint of a broad distribution of social characteristics rather than a universal, or even typical, pattern. Clearly, humans did evolve social proclivities that distinguish us from other primates, so we must be able to speak of general trends in human social evolution, such as those hypothesized above. At the same time, we must balance this general point with the counterpoint of continuous and significant social variation (Smuts 1992; Wilson and Daly 1993).

This emphasis on variation is consistent with the tremendous range of behavioral patterns exhibited by modern, small-scale societies. Consider, for example, two very different human societies, the Yanomamo Indians of the Amazon forest (a horticultural/hunting society; Chagnon 1983) and the Aka pygmies of central Africa (a forager society dependent upon neighboring horticulturalists for critical resources; Hewlett 1991). Among the Yanomamo, lethal fighting between men and violent coercion of women are commonplace. At the other extreme, among the Aka pygmies, violence between men and between men and women is very rare; in fact, after fifteen years of fieldwork, Hewlett reports never having seen a man strike a woman. Yanomamo men try to obtain several wives and are rarely involved in child care. Aka men typically marry monogamously and show more involvement in child-rearing than men in any other human society. These two cultures illustrate the range of possible male reproductive strategies that can develop in the human species. There is no evidence to indicate that Yanomamo and Aka men behave differently because of different genes. At the proximate level, these differences must result from the very different experiences boys and girls have growing up in these two cultures, and from differences in the ecological and social environment encountered by adults. At the ultimate level, we can wonder why females and males in these two societies developed such different types of social relationships to begin with—an important and as yet unanswered question.

These observations, as well as many other kinds of evidence, indicate that human males are not "genetically programmed" to coerce and control women, and that women are not "genetically programmed" to accept subordinate status. Rather, natural selection has favored in humans the potential to develop and express any one of a wide range of reproductive strategies, depending on environmental conditions (e.g., Draper and Harpending 1988; Irons 1979, 1983). In this respect, the evolutionary perspective is in agreement with perspectives that consider male coercion of females conditional rather than inevitable. Clearly, it is critical to pursue further investigation of the circumstances associated

with greater or lesser degrees of patriarchy (e.g., Betzig 1993; Smuts 1992; Wilson and Daly 1993).

CONCLUSION

In conclusion, I will consider several ways in which an evolutionary perspective can improve our understanding of patriarchy.

I want first to recapitulate two essential elements of the evolutionary argument. First, the *ultimate goal* of male control over females is reproduction: men coerce, constrain, and dominate women in order to maintain control over female sexuality and the offspring women produce. Second, although human systems of gender inequality differ from those of animals in numerous important ways, the *ultimate sanction* underlying male control over females is often the same in humans as it is in nonhuman animals: the use of physical force, or violence, to inflict costs on females who resist male control. *So the ultimate goal is control over female reproduction, and the ultimate sanction to achieve this goal is violence.* These evolutionary arguments can help to guide analysis of systems of gender inequality. For instance, they suggest that it will be useful to analyze male economic, political, and social power over women not as ends in themselves, but as means to control female sexuality and reproduction (cf. Rodseth 1990). Evolutionary analysis suggests that whenever we consider any aspect of gender inequality, we need to ask how it affects female sexuality and reproduction in ways that benefit some men at the expense of women (and of other men). Evolutionary analysis is also consistent with the conclusions of many feminists (e.g., Lerner 1986; MacKinnon 1987) that sexual control and sexual coercion lie at the core of patriarchy—and it explains why this is so.

The evolutionary perspective also reminds us that patriarchy is a human manifestation of a sexual dynamic that is played out over and over again, in many different ways, in other animals. Investigation of this sexual dynamic in other species can help us to understand gender inequality in our own species. For example, analysis of variation in female vulnerability to male sexual coercion in nonhuman primates draws our attention to variables such as female dispersal and the degree of male-male cooperation, which may also help to explain variation in gender inequality among humans (Smuts 1992).

Finally, discussion of the six hypothesized factors that led to the evolution of gender inequality in humans points directly to the essential counterstrategies that women must develop in order to reduce gender inequality.

The first two factors—weak female-female coalitions and strong male-male alliances—point to the importance of female political solidarity

aimed at the creation of strong institutionalized protection of women from male violence and other forms of domination (such as changes in legislation related to rape and sexual harassment; Estrich 1987; MacKinnon 1987).

The third factor—male control over resources—points to the importance of economic opportunities for women and of legal protection of women's property rights.

The fourth factor—hierarchical relationships among men—emphasizes the need for women to support economic and political changes that will reduce inequality among men.

The fifth factor—female complicity with patriarchy—stresses the need to identify and change behaviors by women that contribute to patriarchy.

The sixth factor—use of language and ideology to perpetuate gender inequality—points to the need for women to gain access to the media, the pulpit, the classroom, and government, in order to gain an equal voice for feminist ideology.

These suggestions, of course, are not new; they already form a central part of the feminist agenda. I said at the start of this chapter that feminist and evolutionary analyses focus on many of the same issues. The suggestions I have just made show that feminist and evolutionary analyses also converge on many of the same conclusions. I have tried to show that it is possible to integrate feminism and evolutionary biology, and why it is valuable to do so. Further integration of these two perspectives remains a critical challenge for future analyses of patriarchy.

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NOTES

1. "Patriarchy" has two meanings: a narrow, traditional meaning referring to a "system, historically derived from Greek and Roman law, in which the male head of the household had absolute legal and economic power over his dependent female and male family members" and a broader meaning, often employed by feminists, which refers to "the manifestation . . . of male dominance over women and children in the family and the extension of male dominance over

women in society in general" (Lerner 1986:238-239). The broader meaning is intended here and throughout this paper.

2. Those feminist theorists who do address this question explain male desire for power over women in terms of women's contribution to male status (Collier and Rosaldo 1981) or prestige (Ortner 1981). Such arguments, however, do not explain why the desire for status and prestige is such a strong motivation for men (Rodseth 1990), or why power over women is such an important ingredient in male status and prestige, so the origins of systems of female subordination remain obscure.

3. Three main problems arise. First, at the proximate level we face the problem of determining the winner in conflicts of interest between males and females. Although in some instances the outcome may be clear—such as when a male forces an unwilling female to mate—in many cases the outcome can be more ambiguous, especially when the conflict is resolved through means other than force, which is common in other animals just as it is in humans. Second, at the ultimate level, we face the problem of determining the effects of winning or losing conflicts on reproductive success—the ultimate evolutionary currency. Certainly, when males inflict obvious costs on females, such as infanticide, it is valid to conclude that males have the power to reduce female reproductive success. But female strategies also influence male reproductive success—for example, female mate choice can increase the reproductive success of some males at the expense of others. Does this mean that females have power over males, or at least over the males they do not choose? The answer is not clear. Finally, we face the problem of relating zoological definitions of power to definitions of power already developed for humans, which rarely consider the currency of reproduction.

4. Barnard (1983) and Knauff (1991) have criticized Ember's (1978) conclusion that most living foragers exhibit patrilocal residence patterns. Knauff reports that, among the "simplest" foraging societies (i.e., those showing an "absence of significant sociopolitical class distinctions"), only one quarter show patrilocal residence. Rodseth (1991), however, argues that there is good reason to believe that such "simple" foraging societies may be the exception rather than the rule among prehistoric foragers, many of whom probably fought over defensible resources and showed the typical human pattern of male philopatry and female dispersal.

5. This view is consistent with evidence presented by Paige and Paige (1981) that in pre-state societies, fraternal interest groups (composed of related males who live together and cooperate in intra- and intergroup competition) occur in association with stable, valuable, defensible resources.

6. Chimpanzees/bonobos and olive baboons/hamadryas baboons, discussed above, are good examples of dramatic variation in social features between closely related species (olive and hamadryas baboons are so closely related that they produce fertile hybrids in the wild). Grey langurs, which in some habitats form multi-male troops with promiscuous mating and in others form uni-male troops with polygynous mating, are a good example of within-species variation in social organization (Struhsaker and Leland 1987).

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RESOURCE COMPETITION AND REPRODUCTION

The Relationship between Economic and Parental Strategies in the Krummhörn Population (1720-1874)

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A family reconstitution study of the Krummhörn population (Ostfriesland, Germany, 1720-1874) reveals that infant mortality and children's probabilities of marrying or emigrating unmarried are affected by the number of living same-sexed sibs in farmers' families but not in the families of landless laborers. We interpret these results in terms of a "local resource competition" model in which resource-holding families are obliged to manipulate the reproductive future of their offspring. In contrast, families that lack resources have no need to manipulate their offspring and are more likely to benefit from allowing their offspring to capitalize on whatever opportunities to reproduce present themselves.

KEY WORDS: Parental investment; Local resource competition;
Evolutionary demography; Krummhörn (Germany).

Given that wealth enhances reproductive success (as seems to be true in both historical and traditional societies; Low 1993), men face a decision problem regarding how to make the best use of their wealth. On the one hand, they could maximize their own genetic fitness by translating all

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