

Chapter 11

Human Sexuality

The substance of our lives is women. All other things are irrelevancies, hypocrisies, subterfuges. We sit talking of sports and politics, and all the while our hearts are filled with memories of women and the capture of women.

George Moore

Elyot: It doesn't suit women to be promiscuous. Amanda: It doesn't suit men for women to be promiscuous.

Noel Coward

The sexual organs are the true seat of the will, of which the opposite pole is the brain.

Simone de Beauvoir

If you live in rock and roll, as I do, you see the reality of sex, of male lust and women being aroused by male lust. It attracts women. It doesn't repel them.

Camille Paglia

Gay men may seek sex without emotion; lesbians often end up in emotion without sex.

Camille Paglia

It is a wise father that knows his own child.

William Shakespeare

Mothers are fonder than fathers of their children because they are more certain they are their own.

Aristotle

A BIOMATERIALIST UNDERSTANDING OF HUMAN SEXUALITY

Differences in sexual attitudes, emotions, and behavior between men and women are best understood not only in terms of the theory of inclusive fitness, but more specifically in terms of the concept of sexual selection. Sexual selection was identified by Darwin (1871) as a special form of natural selection that acts, not upon an organism's capacity to survive, but upon its ability to find mates and reproduce. Darwin identified two mechanisms of sexual selection, which he called male combat and female choice. Males may compete among each other in various kinds of aggressive ways for access to females, with the winners in these aggressive encounters getting the female(s). This is what happens among deer and elk, for example, whose antlers have evolved as weapons to be used in male combat, or among sea lions and walrus. Or, females may choose males who have particular kinds of characteristics that they favor. Among birds, for example, it is usually the male that is more brightly colored, and this coloration has evolved as a cue for female choice. Among peacocks, elaborate coloration and plumage have evolved because they have been chosen by peahens as desirable qualities in their mates.

Our modern understanding of the operation of sexual selection in animals and humans has been greatly influenced by a seminal article written by Robert Trivers (1972). According to Trivers, the key factor in determining how sexual selection works is parental investment, i.e., which sex invests more time and energy in the rearing of offspring. There is commonly a tradeoff between the relative parental

investment of the sexes and the energy that is put into mating. Among highly monogamous species, such as most birds, the parental investment of the sexes is approximately equal. Under these circumstances, differences in testosterone levels between the sexes are minimal or nonexistent, and the male is essentially the same size as the female. There is little male dominance and males put as much energy into parental care as into mating effort. Among polygynous species, however, males contribute little to parental care and put their energies into mating effort. Males are larger than females (sometimes much larger), they have much higher levels of testosterone, and they are highly dominant over females. Among such species, males tend to be aggressive and to compete vigorously among themselves for access to females. They also tend to control the sexual behavior of females by limiting or preventing their access to other males. Most species are of this latter type. Humans fall into this category, although human males tend to invest more in their offspring than the males of other species. We are a moderately polygynous, moderately sexually dimorphic species.¹

In humans, sexual selection has been fully at work determining men's and women's sexual choices, emotions, and behaviors. Men have competed amongst one another for mates, and both men and women have evolved clear preferences in regard to the opposite sex. Donald Symons's *The Evolution of Human Sexuality* (1979) brilliantly develops a biomaterialist understanding of human sexuality, especially heterosexuality, and shows how it is rooted in sexual selection. Symons first discusses sexual choice. Men everywhere appear to be much more naturally aroused by visual sexual stimuli. In Western societies the male market for pornography is huge, but the female market is extremely small, in fact virtually nonexistent. *Playgirl*, a magazine that shows pictures of nude men, is almost completely supported by gay men. There is an extremely widespread, probably universal, desire on the part of men to be stimulated by the sight of female genitals. As Symons (1979:176) notes, "cross-cultural evidence suggests that the tendency of human males to be sexually aroused by the sight of females – especially the female genitals – and to make great efforts to see female genitals (and any other part of the female body that is typically concealed), simply has no parallel among human females, and is often intuitively incomprehensible to women." Symons interprets this dimension of male sexuality as an evolutionary adaptation that promotes the male's inclusive fitness. The greater the extent to which men are visually aroused the more they will tend to copulate with women, and thus the greater the likelihood of impregnating women. Since human females do not advertise ovulation, there has evolved a male ability to assess a female's reproductive value through visual cues. However, there is no evolutionary advantage to a female to be visually aroused by the sight of naked males. Indeed, this would work against her inclusive fitness because it would compromise her tendency to be choosy and select only those partners she deems most suitable for herself and her future children.

For males, physical attractiveness plays a major role in sexual attraction, and males tend to use certain criteria that are indicators of high female fecundity: health, complexion, cleanliness, condition of the skin, indicators of disease or disability (see also Symons, 1995). Physical attractiveness of the sexual partner is much more important to men than to women; women are more concerned with social status because this is a strong indicator of a male's ability to provide resources for a woman's offspring. Males everywhere show an extremely strong desire for young females. As men get older, the age gap between them and their mates increases, and this seems to be true in both modern industrial and preindustrial societies (Kenrick and Keefe, 1992; Kenrick, Trost, and Sheets, 1996). On the island of Poro, for example, the age gap between the youngest husbands and their mates was less than one year, whereas the age gap between the oldest husbands and their mates was nearly 21 years. This preference for young females is an evolved strategy that promotes males' inclusive fitness. Younger females are much more likely to become pregnant and to produce strong, healthy offspring. They also have a longer reproductive period ahead of them than do older women, and thus men who mate with younger women can produce more offspring over time. In a study of 774 Hungarian males, Bereczkei and Csanaky (1996) found that males who chose younger mates had significantly more surviving children than those who chose older mates. In the same study, the authors interviewed 1,057 Hungarian women and showed that their preference for men of higher status was also reproductively adaptive. Women who married higher-status men left more surviving offspring than women who married men of the same or lower status.

The preference of men for younger women is also indicated by studies of what biologists call *neoteny*, which is the retention of juvenile characteristics in adults. Everyone has had the experience of perceiving the very young offspring of mammals as “cute,” and also of perceiving human infants and children in the same way. The features that make babies and children cute are such things as relatively large eyes, a short distance from mouth to chin, a small nose, and full lips. Women often retain these characteristics to some extent as they mature into adulthood, and there seems to be a strong male attraction to such traits. A recent study (Jones, 1995) examined the faces of 10 leading female models whose pictures had been displayed on the covers of *Cosmopolitan* and *Glamour* magazines. Measurements of facial features were taken and fed into a computer. A program designed to estimate the models’ ages from these facial features alone estimated them to be approximately 7 years old! When the study was repeated using male models, no facial neoteny was found, and the computer predicted the models to be approximately their actual ages.

Devendra Singh and his colleagues (Singh, 1993a, 1993b, 1994; Singh and Young, 1995; Singh and Luis, 1995; Barber, 1995; Furnham, Dias, and McClelland, 1998) have carried out a variety of fascinating studies in which they show that the most important dimension of female sexual attractiveness is a certain type of body shape. Singh found that men in all of his studies preferred a woman with a waist-to-hip ratio (WHR) of about .70. This took precedence over breast size and body weight, and as women’s WHRs increased they were regarded as increasingly unattractive. Many of these studies have involved college men, but it has been found that men of all ages make essentially the same judgments, and so far the judgments are invariant across different racial and ethnic groups. Evidence is rapidly accumulating that a low WHR is an excellent indicator of female reproductive status and overall female health. Girls with lower WHRs show earlier pubertal endocrine activity, and married women with higher WHRs have more difficulty getting pregnant and give birth to their first child at a later age. Circulating estrogen functions to lower a woman’s WHR, but circulating testosterone raises it. As women age, their WHRs increase, and after menopause women’s WHRs approximate those of males. A lower WHR is also associated with a lesser incidence of such diseases as diabetes, high blood pressure, heart attack, stroke, menstrual irregularity, elevated plasma triglycerides, and ovarian and breast cancer. Singh suggests that human males the world over are descended from ancestral males who maximized their inclusive fitness by mating with low-WHR females. As he has put it (1993a:303), “males who sought and were successful in mating with females with gynoidal fat distribution [low WHR] would leave more progeny than males who indiscriminately mated with females. The greater reproductive success of such females would maximize their contribution to the gene pool of future generations. Over time, males would favor females with gynoidal fat distribution and find such females more attractive and desirable.”

More research in highly diverse cultures will be needed to see whether the male preference for females with low WHRs is a true human universal, or at least a near universal, as would be expected. Nonetheless, to this point studies have been conducted in at least seven different cultures or ethnic populations, and the results are positive. Studies of male judgments of female attractiveness in the United States, England, Germany, India, Indonesia, Hong Kong, and Guinea-Bissau show that men prefer women with low WHRs (Singh, Frohlich, and Haywood, 1999). Moreover, Singh, Frohlich, and Haywood (1999) have collected evidence on female attractiveness as depicted in sculptures. They examined the WHRs in 286 sculptures from ancient India, Egypt, Greece, and Africa, and found that the average female WHR was significantly lower than the average male WHR. The average WHR for women was about .70, that for men about .90. These authors also found that poetry from the European Middle Ages emphasized small waists, and that Chinese and Indian poetry gives much more emphasis to waist size than to breasts, thighs, and legs.

However, some researchers claim to have produced disconfirming evidence. Wetsman and Marlowe (1999) found that the Hadza, hunter-gatherers located in Tanzania, showed no preference for .70 WHRs over .90 WHRs. The Hadza displayed more concern for weight, preferring heavier women to thinner ones. But it is not entirely clear that this is actually a disconfirming case. At the 1999 annual meetings of the Human Behavior and Evolution Society, Wetsman pointed out that Hadza men do like women with lordosis (protruding buttocks), so if the line drawings that are used to depict WHR were drawn

from the side rather than from the front it would be the case that Hadza men really do prefer low WHRs. Tassinary and Hansen (1998) also report what they believe is disconfirming evidence. In a study of 136 American undergraduates, they reported that men actually judged drawings with higher WHRs to be more attractive. However, this study seems to suffer from a fatal flaw. Tassinary and Hansen used different line drawings of female WHR than those originally used by Singh and since used by all other researchers. In creating these drawings, Tassinary and Hansen tried to represent a low WHR by expanding hip size rather than contracting waist size. As Bronstad and Singh (1999) point out, by manipulating the drawings in this way the authors confounded WHR with both hip size and perceived body weight, and as a result drawings with low WHR were judged to be as much as 20 pounds heavier and 14 years older than figures with high WHRs. Since American men judge younger women and thinner women to be more attractive, it is no wonder that they judged the drawings with lower WHRs more negatively. Bronstad and Singh (1999) and Streeter and McBurney (1999) show that when Tassinary and Hansen's drawings are properly corrected men judge WHRs of about .70 to be more attractive.

Although males value physical attractiveness more than females, females do regard this attribute as important. Singh (1995) has shown that American women ranging in age from 18 to 69 had a clear preference for men with a WHR of about .90, which is approximately the average male WHR. It turns out that, just as a low WHR is a good indicator of female health, a high WHR is a good indicator of male health. Women therefore prefer healthy men, and they do so because healthy men are more likely to live longer and to be better providers for their wives and offspring.

Today in Western societies males have a strong preference for thin women, whereas in the past plumper women were preferred. The change relates to the perception of healthiness. In earlier times plumpness was a sign of good health, but it has now become a sign of poor nutrition and it is thinness that signals good eating habits and thus good health. Moreover, plumpness and thinness are closely associated with status. As Symons (1979:199) remarks, "Plumpness has gone out of fashion in Western societies during the last century, probably as a result of the changing relationship between body fat and status: when food was scarce for many people, plumpness was a sign of wealth, but as circumstances improved for the majority, the rich began to distinguish themselves through thinness."

Symons is quick to point out that none of the above findings suggest that there are no cultural differences in standards of attractiveness. Here, as elsewhere, human behavior is the product of the complex interaction between biological predispositions and the total physical and social environment. However, is it unlikely that cultural differences in standards of attractiveness will be found that directly undermine the unconscious goals of both males and females in maximizing their reproductive success. No one has yet discovered a society where men prefer older, unhealthy women who have low reproductive value or where women prefer unhealthy men with low social status and few resources.

Men everywhere also have a tremendous desire for sexual variety for its own sake. This is highly adaptive in terms of the male's inclusive fitness. The more sexual partners a man has, the more females he will impregnate and the larger his number of offspring. Although studies show that the number of married women who have affairs is not dramatically smaller than the number of men who do, Symons interprets this in terms of what men and women, respectively, are looking for in an extramarital affair. Men, it seems, desire mainly sex, whereas women value the extramarital relationship *as a relationship* and use sex as a means of establishing and cementing the relationship. Women often seek extramarital affairs because of a dissatisfaction with their marriages. At the risk of oversimplification, women are using sex to get love, but men are using love to get sex. Whereas philandering can promote a male's inclusive fitness, it can actually reduce a female's. Philandering women can reduce their fitness by alienating their husbands, who throughout history have been the economic supporters of females and their offspring. Moreover, a woman can have a very limited number of pregnancies in her lifetime, and mating with many different men will not alter this.² Men, of course, can impregnate literally hundreds or thousands of women, and thus have evolved a reproductive strategy that helps them do so.

From the standpoint of his inclusive fitness, one of the worst things that can happen to a male is to be cuckolded by his mate, that is, be led by her to believe that her offspring fathered by another man are really his. As a result, he promotes the other man's inclusive fitness rather than his own. To combat this

outcome (which occurs with considerable frequency), males have evolved techniques of guarding their mates from other males. Sexual jealousy, often taking an extreme form, is an emotion that has evolved as an anticuckoldry device (Daly, Wilson, and Weghorst, 1982). The pattern of sexual jealousy among humans everywhere only makes sense in terms of sexual selection. Daly, Wilson, and Weghorst (1982) argue that males have aggressively competed for women throughout hominid history. Throughout the world's societies there is remarkable consistency in the view that sexual intercourse between a married woman and someone who is not her husband is a violation; the victim is the husband, who is entitled to compensation. Many societies have punished adulterous women severely. A jealous rage is expected in many societies as the result of this offense against a husband. Adultery by a wife is perhaps the single most common reason for divorce throughout the world, and the main cause of male aggression against women. And men seek to control female sexuality in all societies, often by such means as claustration, footbinding, chastity devices, genital mutilation, and male chaperonage. As the above implies, men have stronger jealousy than women; it is less easy for them to forgive a wife than for a wife to forgive her husband. Women in many societies are reconciled to the adulterous affairs of their husbands.

Daly, Wilson, and Weghorst examine the claims of many authors (e.g., Whyte, 1978; Stephens, 1963; Ford and Beach, 1951; Leacock, 1980) that there are a number of societies in which jealousy is not displayed and where both sexes are allowed considerable sexual freedom outside marriage. They challenge these claims. With respect to Stephens, they claim that many of the societies which he claims permit adultery do so only under very restrictive circumstances. They claim that Stephens himself gives numerous examples of male aggression toward adulterous wives in some of the 12 societies that he classifies as "permissive." The authors focus on 11 societies that have been identified by others as unusually permissive; in all of these societies, they say, men restrict the sexual liberty of their wives and use violence or the threat of it in doing so.

Daly, Wilson, and Weghorst conclude that sexual jealousy, especially as displayed by husbands toward wives, is probably a human universal, at least as a human emotion. David Buss (2000) agrees, but goes further in giving equal emphasis to female jealousy of husbands. For Buss, female jealousy is just as much an evolutionary adaptation as male jealousy, because philandering men may impose high costs on their wives or lovers. A philandering man may leave his wife or lover for another woman, and thus the wife or lover loses the resources that man provides for her and her children. In the ancestral environment, women were critically dependent on such male provisioning. There may, however, be differences in the extent to which the emotion of jealousy is openly displayed. The authors point to Greece and the Hidatsa/Crow as contrasting cases in terms of the expression of jealousy. Public displays of male jealousy are considered bad form among the Hidatsa/Crow, but it is the lack of such display that is considered shameful among the Greeks. Nevertheless, "the emotional response is present in both societies. Such evidence of the psychic unity of humankind rebuts that extreme environmentalist position that considers particular cultures to be the wellsprings of human passions. Male jealousy cannot be understood as an arbitrary product of a specific social history. It is instead a predictable product of evolution" (Daly, Wilson, and Weghorst, 1982:24).

There appear to be important, and highly predictable, sex differences in jealousy. Buss, Larsen, Westen, and Semmelroth (1992) have carried out several relevant studies. In one study they found that 60 percent of the males reported more distress over sexual infidelity than to their mates' emotional attachment to a rival. By contrast, 83 percent of the women indicated that they would be more distressed over their mates' emotional attachment to a rival. In another study they measured men's and women's physiological arousal to imagined sexual infidelity compared to imagined emotional infidelity. Men showed much more arousal with respect to sexual infidelity, whereas women showed just the opposite, and this difference was very large. Although these results pertain to American subjects, very similar results have been reported from studies in China, Korea, Japan, Germany, the Netherlands, and Sweden (Buss, 2000). These findings are exactly what one would expect from a biomaterialist perspective, the theory of sexual selection in particular. Men are concerned with gaining and controlling mates and preventing other men from inseminating them. That is what promotes their inclusive fitness. Women, on the other hand, are more bothered by emotional infidelity because to promote their inclusive fitness they seek to find mates who will

be loyal providers for them and their offspring. Emotional attachment or bonding is what solidifies such a relationship, and so women are more concerned about anything which threatens that emotional bond.

On average, it is the male who has the stronger sex drive and who shows more persistent interest in sex, although there can be considerable variation in the extent to which this is true. Copulation is, Symons argues, a service that females provide for males in all societies, and it is the males who woo and court females rather than the other way around. As Symons (1979:258) notes, "it is not a coincidence that males generally are the gift givers as well as the prostitute payers." Moreover, "copulation as a female service is easily explained in terms of ultimate causation: since the minimum male parental investment is almost zero, males stand to benefit from copulation with any fertile female (if the risk is low enough), whereas females do not stand to benefit reproductively from copulating with many males no matter what the risk is" (Symons, 1979:261).

Symons provides what he believes is a decisive test of these conclusions by looking at the behavior of homosexual men and women. As he notes, pornography has a strong appeal to gay males, but lesbians show little interest in it. Lesbians also have little interest in extramarital affairs and tend to build long-lasting and faithful monogamous relationships. Gay males, by contrast, have a marked tendency toward promiscuity, even more so than heterosexual males. Symons points out that many gay males have reported having over 500 sexual partners in their lifetimes, and he relates the case of one gay male who had anal intercourse with 48 different partners in a single evening. Bell and Weinberg (1978; reported in McKnight, 1997), using a sample of 685 gay men, found that over 90 percent reported having had more than 25 partners, almost half reported more than 500 partners, and nearly a quarter claimed to have had more than 1,000 partners. Symons interprets such high rates of promiscuity as the result of the lack of need of male homosexuals to compromise with women. In all-male relationships, men can give their desires free rein. Symons claims that the actual amount of extramarital activity heterosexual men have always stems from a compromise with their wives. With homosexual men, this necessity for compromise disappears.

In a massive study of over 10,000 individuals from 37 cultures, the evolutionary psychologist David Buss (1992, 1994) has confirmed many of Symons's findings and added several new wrinkles of his own. The large number of individuals who made up this study were located on six different continents, came from both rural and urban areas, and were widely representative of different socioeconomic levels. Buss found women to be about twice as likely as men to give importance to a partner's economic resources, and women were more desirous of a high-status partner. As Buss notes, "social status is a universal cue to the control of resources. Along with status come better food, more abundant territory, and superior health care" (1994:26). Women shun men, he says, who can be easily dominated by other men or who do not command the respect of the group. Interestingly, women who themselves have high status and considerable economic resources do not relax their desire for high-status and resource-rich men; indeed, empirical evidence suggests that such women still prefer men who have more status and resources than they do (B. Ellis, 1992).

Buss also shows that women generally prefer men who are older than they, on average men who are about three and a half years older. This makes sense in evolutionary terms because older men are more emotionally and economically stable and more likely to be good providers. Other qualities that women seek in men are ambitiousness, which turned out to be much more highly regarded by women than by men; intelligence, because more intelligent men are better providers of resources; and size, strength, and physical prowess, qualities that obviously relate closely to resource-providing abilities. Like Kenrick and Keefe, Buss found that men prefer younger mates, and that they take on younger and younger mates to the extent that they can do so. By and large, the more male dominated the society, the greater was the age gap between men and their wives or lovers.

According to Buss, men not only value sexual fidelity, but rate infidelity as the least desirable characteristic in a wife. His research shows that unfaithfulness is more upsetting to men than any other emotional pain a woman can inflict on her mate. This finding dovetails perfectly with the findings discussed earlier regarding sexual jealousy.

Tooby and Cosmides (1989b:37) summarize the enormous importance of all of these empirical findings for a biomaterialist understanding of human sexual behavior:

culture theory as it stands predicts the null hypothesis: that differences between cultures are random with respect to evolutionary hypotheses and therefore that, for example, sex differences should occur as frequently in one direction as the other. The assertion that “culture” explains human variation will be taken seriously when there are reports of women war parties raiding villages to capture men as husbands, or of parents cloistering their sons but not their daughters to protect their sons’ “virtue,” or when cultural distributions for preferences concerning physical attractiveness, earning power, relative age, and so on, show as many cultures with bias in one direction as in the other.

SEXUAL ATTITUDES AND PRACTICES CROSS-CULTURALLY: THE “SOCIAL CONSTRUCTION” OF SEXUALITY

Western society has historically been what Vern Bullough (1976) calls a *sex-negative* society. Societies of this type are less common cross-culturally than permissive or *sex-positive* societies. Many examples of sex-positive societies have been given by Ford and Beach (1951). In some permissive societies infants and young children are actively stimulated sexually by adults. For example, parents frequently masturbate their children among the Hopi and Siriono. Among the Pukapukans of Polynesia, it is considered acceptable for boys and girls to masturbate openly in public. Children among the Seniang will publicly simulate sexual intercourse without being admonished by adults. Among the Alorese children acquire knowledge of sexuality very early and by age 5 they have detailed knowledge of sexual intercourse and reproduction. It is thought by the Lepcha of India that girls will not mature properly unless they have had sexual intercourse. Girls aged 11 or 12 normally engage in intercourse, and older men sometimes engage in sex with girls as young as 8. The Trobriand Islanders of Melanesia are renowned for their sexual permissiveness. Sex life may begin for young boys as early as age 10 and for young girls as early as age 6.

The preceding societies are all band or tribal societies. What of agrarian civilizations? Outside of Western civilization, with its sex-negative religion of Christianity, sexual permissiveness has been the norm. The Greeks were a fairly permissive culture, and are famed for their institutionalized form of homosexuality between older men and young boys (Cantarella, 1992; Percy, 1996). Within the framework of their educational system, male tutors would take their young boy pupils as lovers for a period of time. They would engage in both anal and intercrural intercourse (intercrural intercourse involved the tutor’s placing his penis between the legs of the boy and ejaculating). Fellatio was strictly taboo. This homosexual relationship was highly idealized and regarded as beneficial to both parties. It was thought to make the boy more masculine and was linked with military courage and valor. In due time, however, the tutor abandoned the relationship, married, and took up a conventional heterosexual life. And although the Greeks looked very favorably on the tutor-pupil sexual relationship – or at least the Greek tutors did so; parents of the boys and other members of Greek society often had a very different attitude – they looked most unfavorably on exclusive homosexual relationships between men.

In its early stages, Roman society looked negatively on Greek tutor-pupil homosexuality, although the Romans did consider it acceptable for a man to have sex with a male slave, and such relations were relatively common (Cantarella, 1992). “Passive homosexuals” on the other hand – men who took the receptive position in anal intercourse – were thought to be highly effeminate and were disdained. In due time, however, the Romans moved increasingly toward the Greek pattern, and by the second century BC Roman men were openly courting free-born boys (Cantarella, 1992). Love relationships between men and free-born boys became common, although they were not connected to the educational system. Even passive homosexuality became increasingly common, and male prostitutes emerged. As for female homosexuality, the Romans looked very negatively upon this, considering it morally depraved (Cantarella, 1992).

Much of Islamic civilization was generally sex-positive, and male homosexuality, as long as it was discriminating and selective, was condoned (Bullough, 1976). India was also a sex-positive civilization, in fact perhaps the most sex-positive of all the historic agrarian civilizations. Hindus thought that women enjoyed sex at least as much as men, and a wide range of sexual practices was considered acceptable. The

Chinese were quite open about sex and wrote many manuals about its nature and performance (Bullough, 1976). The Chinese also had a form of man-boy homosexuality that resembled the Greek pattern, even in its linkage with the educational system and its disdain for exclusive homosexual relationships between men. Japan was another agrarian civilization with relative sexual openness and institutionalized man-boy homosexuality (Leupp, 1995).

Institutionalized homosexual relationships have also been common in a number of band and tribal societies. In some North American Indian societies, a man known as a *berdache* dressed as a woman, performed women's roles, and engaged in sexual relations with other men, all with social approval. Other societies have had the local equivalent of a *berdache*. In northern India this person is known as a *hijra*, in Polynesia as a *mahu*, and in Oman as a *xanith* (LeVay, 1996).

Ford and Beach (1951) provide insight into homosexuality in band and tribal societies. Among the Siwans of Africa, men and boys engaged in anal intercourse, and males who preferred not to engage in this practice were thought to be peculiar. The Azande of the Sudan exhibited a pattern of homosexuality very similar to the Greek pattern. Institutionalized homosexuality is widespread throughout Melanesia (Herdt, 1984). Among the Etoro of New Guinea, all men marry but there are as many as 260 days per year in which they are forbidden to have heterosexual intercourse. Men and young boys sleep together apart from women and girls in men's houses. The Etoro believe that every male possesses a finite amount of semen and that men acquire semen from other men in the form of a gift. This occurs primarily as a result of young boys fellating older men. Boys also engage in receptive anal intercourse with men. As in the case of the Greeks, the man-boy relationship is thought to contribute to the boy's masculinity (Harris, 1981).

How can we explain these various patterns of sexual behavior, especially the widespread existence of socially approved – indeed, sometimes idealized – homosexuality? On the surface, these patterns would seem to confirm the social constructionist view and strongly challenge a biomaterialist interpretation of human sexuality. But closer scrutiny of these patterns shows that biomaterialist and ecomaterialist interpretations make good sense. First, note that all of the patterns of homosexuality described above are ones engaged in by men who are preferentially heterosexual. They either practiced heterosexuality along with homosexuality, or they experienced a brief period of homosexual relations followed by a much longer period of marriage and heterosexuality. As it turns out, heterosexuality is the most common sexual practice in all societies, just as inclusive fitness theory tells us it must be (see Chapter 2). Homosexuality, if it is practiced, is always secondary to regular heterosexual relations, and in most cases there are strict rules regarding what kind of homosexual relations may be practiced and with whom and how often. These patterns of homosexuality appear to represent the type of homosexuality that may be called *situational* or *substitutional*, which means that men are substituting homosexual relations for heterosexual ones in situations where they have no sexual access to women or where that access is severely curtailed. The most familiar form of situational homosexuality in modern Western societies is that practiced by men in prisons.

Richard Posner (1992) has argued that the Greek form of homosexuality was a type of situational homosexuality that arose because of the particular way in which access to females was limited in this society. Women of the citizen class were secluded, and marriage was late. Male citizens disdained the use of prostitutes, so this sexual outlet was closed off to them. These men thus turned to their boy pupils as a substitute. Other widely found forms of man-boy homosexuality may have developed for similar reasons. Gilbert Herdt (1984) suggests that the scarcity of females among Melanesian groups like the Etoro may have been due to such factors as widespread polygyny, or, for unclear reasons, many fewer females being born. The Etoro also had systematic rules restricting the amount of heterosexuality men were permitted to engage in, and these rules may have been prompted by population pressure.

Two more features of situational homosexuality help to confirm a biomaterialist interpretation of human sexuality. First, it is obvious that all of the patterns of homosexuality we have been describing are ones engaged in only by men. In fact, there is much less female situational homosexuality throughout the world than male situational homosexuality. (Actually, I am not aware of any well-known instance of female situational homosexuality.) The reason, I think, is that the male sex drive is much stronger than the female's, and thus is much more vigorous in seeking an outlet. Second, situational homosexuality seems to be most commonly man-boy homosexuality, and often the very societies that look favorably on man-boy

sexual relations strongly disapprove of homosexual relations between adult men. Why are boys a very common target of men all over the world? The answer seems to be that boys most closely resemble males' ideal sexual target, the adolescent or adult female. Take two 12-year old, prepubescent children, one boy and one girl, cut their hair the same length, and turn them facing away. In some cases it will be difficult to tell which is the boy and which the girl.

PREFERENTIAL HOMOSEXUALITY AND ITS CAUSES

There is also much more homosexual *behavior* throughout the world than there are *homosexuals*. What this means is that most homosexual behavior is engaged in by preferentially heterosexual males. The other form of homosexuality is *preferential* homosexuality, which involves persons who are totally, or almost totally, committed to homosexual relationships and are unable to change or to find heterosexual relations gratifying. It is currently estimated that about 2-4 percent of the populations of Western industrial societies are preferentially homosexual, a figure that may hold for many other societies as well. This type of homosexuality must be explained very differently, but a biomaterialist interpretation will still hold. We have already examined and criticized social constructionist theories of sexuality. Such theories work no better for preferential than for situational homosexuality.

A great deal of research has been done on the biological roots of homosexuality. In an early article, Lee Ellis and Ashley Ames (1987) reviewed much of this research and offered the following theory:

1. Human sexual orientation is determined in essentially the same way as in all other mammals.
2. Sexual orientation in all mammals is primarily determined by the degree to which the nervous system is exposed to testosterone and other sex hormones during the period in which neurological organization is taking place in the developing fetus.
3. For humans, sexual orientation appears to be primarily determined approximately between the middle of the second and the end of the fifth month of gestation.
4. Homosexuality develops when, during the critical developmental period, the fetus's brain receives an excess of the hormone(s) of the opposite sex. Male homosexuals thus have fetally "feminized" brains, whereas lesbians have fetally "masculinized" brains. (A more accurate way of putting this would be to say that male homosexuals have brains that have not been both "defeminized" and "masculinized." Since all fetuses start out female, the brain starts out feminine.)

On the basis of their theory, Ellis and Ames make the following predictions:

1. *Homosexuality should be primarily a male phenomenon.* This is because all mammals are fundamentally female, and it is only by inserting the Y chromosome into the mammalian genome that masculinity develops. This leads to more sexual inversions in genetic males than in genetic females. The cross-cultural literature supports this notion, as does the cross-species literature.
2. *Homosexuals should have higher frequencies of other sexual inversions than heterosexuals.* In other words, male homosexuals are more likely to be "effeminate" and to have "feminine" interests than male heterosexuals, and lesbians are more likely to have "masculine" characteristics and interests than female heterosexuals. Of course, some male homosexuals do not display feminine characteristics, and some lesbians do not display masculine characteristics. It is not either/or, but a matter of degree. It should also be noted that a high percentage of adult homosexuals exhibited gender-atypical behavior as children, e.g., boys wanting to play with girls and dolls rather than other boys and guns and trucks.
3. *Homosexuality should have a significant degree of heritability.* The evidence does show support for this. There is a higher rate of homosexuality in identical twins than in fraternal twins (see below).
4. *Attempts to alter sexual orientation after birth should be minimally effective or ineffective.* What this means is that homosexuality should be as difficult to change as heterosexuality would be, and the data show this quite strongly. The greatest success seems to be with bisexuals, which is not at all surprising, but even this is quite limited. Successful "treatment" seems to be all but impossible for people who have not had any pleasurable heterosexual experiences before entering a "treatment" program.

Since Ellis and Ames surveyed the research literature, a great deal of additional research has been done, and the data offer very strong support for a biomaterialist interpretation of preferential homosexuality. Fred Whitam (1983; Whitam and Mathy, 1986) studied the childhood experiences of 375 homosexual men in Guatemala, Brazil, the Philippines, Thailand, Peru, and the United States. On the basis of his research, he concluded the following (cited in Burr, 1996):

1. Homosexuality is universal.
2. The percentage of homosexuals in all cultures is approximately the same (about 5%) and remains stable over time.
3. The emergence of homosexuality is not affected by social norms regarding it. Homosexuality is just as likely to appear in societies that are homophobic as in those that are much more tolerant of homosexuality.
4. Given a large enough population, homosexual subcultures will be found in all societies.
5. There are striking resemblances in behavioral interests and occupational choices between homosexuals in different societies.
6. In all societies homosexuals run the gamut from highly feminine to highly masculine.

Clearly these findings suggest that preferential homosexuality is innately given rather than some sort of social construction or personal choice.

Widely publicized research by Simon LeVay (1991, 1996), formerly a neuroscientist at the Salk Institute in San Diego, leads to the same conclusion. LeVay examined a small portion of the hypothalamus, known as INAH3, in the brains of homosexual men who had died from AIDS. He found that this region of the brain in the homosexual men was only about one-third to one-half the size of the region in the brains of heterosexual men. He also confirmed an earlier researcher's finding that INAH3 in heterosexual females was about the same size as INAH3 in homosexual men.

Evidence that a behavior pattern widely found among humans is also prominently represented among nonhuman animals is usually taken to be good evidence for the role of biology. In the case of homosexuality, we do find it among many other animal species (studies reviewed in LeVay, 1996). In 1963 a Yale genetic researcher discovered a strain of fruitflies in which the males were "courting" other males. He was eventually able to track down the mutant gene responsible for this behavior, and concluded that it was X-ray induced. A group of researchers at Brigham Young University studied six male rats that refused to mount females. When their brains were examined, a portion of the hypothalamus was found to be only about half the size of the hypothalamus of other male rats, almost exactly what LeVay found for humans. At a sheep experimental station in Idaho, it was found that some rams refused to mount ewes but would mount and anally penetrate other rams. When the brains of these rams were studied, they were shown to differ significantly from the brains of the heterosexual rams. So-called lesbian pairing has been observed in some seagulls.

Research establishes that preferential homosexuality has a clear genetic component (studies reviewed in LeVay, 1996). A study by Bailey and Pillard of male identical twins found that when one twin was gay, 52 percent of the time the other twin was also gay. The number was only 22 percent for fraternal twins. A study by Fred Whitam obtained corresponding numbers of 65 percent and 29 percent, and research by Bailey and colleagues of female twins obtained numbers of 48 percent and 16 percent. Dean Hamer (Hamer and Copeland, 1994) has tried to identify a "gay gene." He and his research team have found a region of the X chromosome known as Xq28 that they believe holds a gay gene. This gene is passed only through women. (In order to understand the genetic foundations of behavior we have to realize the complexity and subtlety of genetics. Consider the observation that, in identical twins, if one twin is left-handed then the other twin has only a 12 percent chance of being left-handed. In gays, if one twin is gay then the other has about a 50 percent chance of being gay. Does this mean that 12 percent of handedness is genetic, 88 percent being due to something environmental, and that 50 percent of homosexuality is genetic, the other 50 percent environmental? Of course not. Handedness surely is entirely genetic, and sexual orientation may be as well. People may have the same gene, but the gene for some reason expresses itself in one person but not in the other.)

If there is a so-called gay gene, how might it work? Actually, there is probably a whole set of gay genes, each of which regulates in a specific way one aspect of neurological development. There is more than one genetic way to become gay. Multiple genes can be strongly suspected, and this is probably what explains some important differences among gays, e.g., that some gay men are effeminate but others are not.³

SEXUAL VIOLENCE

Perhaps the most popular theory of rape, or forced sexual copulation, is the feminist theory. This theory holds that rape is only incidentally about sex and is mainly a violent act of power in which men exert or reinforce their domination over women (Ellis, 1990). Randy and Nancy Thornhill (1983, 1992) explode this theory in terms of an analysis of rape laws. As they point out, these laws are made overwhelmingly by men, and for the purpose of protecting men's interests. Rape works against men's interests because a man's own wife, mother, sisters, and daughters can be raped. Men thus stand to lose more from rape than they might benefit. Moreover, the Thornhills review data which show that the greater the prevalence of polygyny in a society, the more severely rape is punished. In an analysis of 29 preindustrial societies, they show that none of the monogamous societies punished rape with death, whereas 22 percent of the mildly polygynous and 83 percent of the highly polygynous societies did so. Rape is undoubtedly much more common the more polygynous the society, and thus is punished more severely as a deterrent in these societies. Highly polygynous societies are also apt to be among the most male dominated of societies, and thus there is a close correlation between male domination and the severity of punishment for rape. This is just the opposite of what the feminist theory is saying – that male domination and toleration for (or actual encouragement of) rape are closely related.

The Thornhills (cf. Shields and Shields, 1983) propose that rape is a reproductive strategy employed by those men who have lost out in the sexual competition for females, for whatever reason. Rapists differ from nonrapists mainly in the fact that they have been unable to climb the social ladder and acquire resources that would attract mates. The Thornhills support their argument with the following lines of evidence:

1. *Rapists focus on women who are near their peak fertility.* They review a number of studies showing that the vast majority of rape victims are between the ages of 16 and 34. After the mid-thirties, the number of rape victims drops off very sharply and continues to decline with advancing age. This is exactly the pattern that should be found if rape is an alternative reproductive strategy, i.e., a matter of sex rather than power.
2. *The rapists themselves are overwhelmingly young men, mostly men between the ages of 20 and 30.* The tendency of men to rape drops off very sharply after the age of 30 and continues to drop throughout a man's lifetime. What this means is that men are most likely to rape at the age at which the competition for mates is most severe.
3. *Males with the greatest difficulty climbing the social ladder are overrepresented among rapists.* The Thornhills review data which show that rapists come overwhelmingly from lower socioeconomic backgrounds and are poorly educated.
4. As noted above, *punishment for rape is more severe in societies with widespread polygyny, which probably reflects the greater occurrence of rape in such societies.* The greater frequency of rape logically follows from the increased sexual competition produced by widespread polygyny. Also, rape appears to be more common in societies with brideprice than in those without it (brideprice increases economic barriers to mating). Furthermore, a study of the Gusii of Kenya shows that in 1936-37 the brideprice became exorbitant, and during this same period there was a serious outbreak of rape. As the brideprice soared again in the 1950s, rape increased once more.

One additional line of evidence suggesting that rape is primarily about sex has to do with the much greater occurrence of rape during war. As Symons (1979) and others have noted, men desire low-cost sex, and the probability of rapists being caught and punished during war is virtually zero.

Randy Thornhill and Craig Palmer (2000) have elaborated on the earlier work of the Thornhills. They continue the argument that rape is a conditional strategy used by men who have lost out in the competition for mates. Men are most likely to rape when they have limited resources, are socially disenfranchised, have limited sexual access or few or no rewarding romantic relationships, are of low phenotypic or genetic quality, or are presented with rape opportunities in which the benefits are high and the costs low. The authors disagree over the question of whether rape is an evolutionary adaptation. Thornhill views it as such, but Palmer considers it a by-product of an adaptation, viz., male sexual assertiveness.

Thornhill and Palmer pay special attention to the extreme psychological pain that women often suffer as the result of being raped. This pain, they suggest, stems from the high reproductive costs that rape imposes on women: Rape reduces the ability of a woman to decide when she will reproduce and, most significantly, to select the man who will father her children; it prevents a woman from using sex as a means of gaining material benefits from men for the use of herself and her offspring; and, if she is already pair-bonded, rape often has a negative effect on her relationship with her mate inasmuch as he may be suspicious of her story that she was raped (or, alternatively, fear that the rapist has impregnated her) and thus leave her or withdraw resources from her. Their overall argument predicts that women of reproductive age should be more traumatized by rape than prereproductive and postreproductive women, and that married women should experience more psychological pain from rape than unmarried women. Reproductive women should experience more pain from rape because it interferes with their reproductive choices, and married women should find rape more anguishing because it may harm their relationships with their mates. And, indeed, the data offer strong support for these predictions.

Thornhill and Palmer also point to cross-species and cross-cultural evidence of the prevalence of rape to support their argument that rape is a conditional sexual strategy (the very same evidence hammers another nail into the coffin of the feminist or standard social science explanation that rape is only about power). Throughout the animal world we find that males are more sexually assertive and more eager to copulate, especially in polygynous species, and actual rape appears to be widespread among nonhuman species. As Thornhill and Palmer (2000:144) note, "There is no longer any question that physical force, harassment, and intimidation are used widely by males across animal species, including in the great apes, to obtain mates." Rape also appears to be a cross-cultural universal in spite of arguments to the contrary. A number of "rape-free" cultures have been proposed, but more careful scrutiny of the cases mentioned shows that at least some rape occurs in all of them.⁴

NOTES

1. Alexander et al. (1979) present data on the degree of sexual dimorphism and degree of polygyny in 58 species of animals. Male northern fur seals weigh six times as much as females, and they have an average harem size of 40 and a maximum harem size of 153. At the other end of the spectrum, male and female harp seals are the same size and they are monogamous. Among primates, gorilla males weigh almost twice as much as females, and they have a mean harem size of 5.4 and a maximum harem size of 9. A similar pattern is found among hamadryas baboons. Gibbons are monogamous, and males and females are about the same size. I analyzed some of Alexander et al.'s data, and found strong correlations between sexual dimorphism and polygyny. For all 58 species of animals (pinnipeds, ungulates, and nonhuman primates), length dimorphism correlated (Pearson r) .702 with mean harem size and .591 with maximum harem size; weight dimorphism correlated .807 with mean harem size and .756 with maximum harem size. For primates alone, length dimorphism correlated .589 with mean harem size and .578 with maximum harem size; weight dimorphism correlated .570 with mean harem size and .608 with maximum harem size.
2. More recently, it has been argued that women may actually realize inclusive fitness benefits from infidelity, or at least may have done so under ancestral conditions (Buss, 2000:158-69). By having an affair with another man, a woman may provide herself with "mate insurance": If her husband or lover abandons her, she then has another mate ready to take his place. Or a woman may have an affair with a man whom she judges to be genetically superior to her current husband or lover (Gangestad and Thornhill, 1997). If this man impregnates her, she thus ends up with offspring who have better genes. Another possibility is that in having affairs women may be

employing a strategy of “trading up” (Fisher, 1992): A woman may perceive that her current mate’s value has declined, or that her own mate value has increased, and thus she believes she can do better in the mating market. These arguments, however, are still somewhat on the speculative side and not enough empirical evidence for them has accumulated. They still need more, and more rigorous, testing.

3. The view taken here is obviously that preferential homosexuality is not an adaptation but rather the result of a biological mistake. However, some scholars have argued that homosexuality is an evolutionary adaptation. Some years ago E.O. Wilson (1978) presented what he called the “nest helper” theory. Homosexual men would sacrifice their own reproduction in order to provide special assistance to their siblings’ children. In my view, this theory is highly unconvincing because Wilson fails to provide a compelling argument as to why such a phenomenon would evolve. Nor is there any evidence to show that gay men actually are more attentive to their siblings’ offspring than heterosexual men are to their nephews and nieces. A more plausible adaptational theory has been presented by Jim McKnight (1997). He views male homosexuality as a balanced polymorphism akin to sickle-cell anemia. Homosexuality, he says, is adaptive in its heterozygous state but maladaptive when homozygous. His logic runs like this: Men with one gay gene (who will be preferential heterosexuals) will have a certain kind of charm that makes them alluring to females, and thus they will have more mating and reproductive success than men without a gay gene. But men with two gay genes, who will be preferential homosexuals, will be rejected by women and will not desire them anyway, and thus will engage in little or no reproduction. It must be admitted that this theory is intriguing, but McKnight presents no evidence at all to support his argument except to say that men who are especially charming and sensitive to women’s needs will be alluring to them. This may well be true, but we have no knowledge at the moment to suggest that such men carry any type of gay gene. At this point McKnight’s argument is pure speculation. McKnight believes an argument such as his is the only way of explaining why homosexual genes continue to be maintained in human populations. However, this is not as difficult as McKnight thinks. Hamer and Copeland’s argument that there is a gay gene that is passed through women will work. Since the gene is passed through women who are not gay, and since many of the men who acquire this gene are not gay, there is no difficulty seeing how the gene can persist in populations.

There are also possible biological but nongenetic routes to homosexuality. Ray Blanchard (1999; Blanchard et al., 1998) has shown that a disproportionate number of gay men have a large number of older brothers. Blanchard suggests that this is because of the action of a particular kind of prenatal antigen that builds up in women with the birth of each son (but not with each daughter). A man with many older brothers is thus at greater risk for homosexuality. However, even if Blanchard is right, this will account for only about one gay man in seven.

4. Thornhill and Palmer (2000:128-40) take up and critique nine specific assertions of the feminist or SSSM theory of rape and convincingly refute each. In my opinion, they completely demolish this theory and, moreover, persuasively show that it has been driven almost entirely by ideology rather than by evidence. An especially interesting question raised by the authors is, if rape is simply about domination, why don’t men use much less costly nonsexual forms of aggression to dominate women? Why resort to an act that is usually severely punished and therefore very risky?

Chapter 12

Sex and Gender

In the theory of gender I began from zero. There is no masculine power or privilege I did not covet. But slowly, step by step, decade by decade, I was forced to acknowledge that even a woman of abnormal will cannot escape her hormonal identity.

Camille Paglia

It would be futile to attempt to fit women into a masculine pattern of attitudes, skills and abilities and disastrous to force them to suppress their specifically female characteristics and abilities by keeping up the pretense that there are no differences between the sexes.

Arianna Stassinopoulos

THE GENERAL PATTERN

All societies have a sexual division of labor, meaning that they all make sex relevant to assigning individuals to tasks within the society. All societies have certain tasks and roles that they consider “masculine,” others that they consider “feminine.” These tasks will be carried out exclusively or at least predominantly by just one sex. All societies also have sexual inequality, which means that in every society men and women are unequally placed with respect to has power or authority, who occupies the most valued roles or positions, and who has more control over whom. Societies differ in just how much sexual inequality they have, but there is no society that is completely egalitarian with respect to sex.

In terms of the most basic features of the sexual division of labor, research has shown that, across the world and throughout history, men seem to be assigned tasks that (Parker and Parker, 1979):

- involve greater strength and stamina;
- are more dangerous or risky;
- are not easily interruptible;
- require high levels of skill and training;
- and require long periods of time away from home base.

Women, then, tend to be assigned tasks that are the opposites of these, i.e., that involve little strength, are not dangerous or risky, etc. Why should there be this worldwide pattern? For the most part, it is explainable in terms of women’s responsibilities for infant and child care, especially the nursing of infants (J. Brown, 1975; Lancaster, 1991). Heavy infant and child care responsibilities prevent women from being concentrated in roles that require long periods of time away from home. It makes much more sense to leave women at home in charge of infants and children than to disrupt the lives of these offspring by moving them here and there. Moreover, infant and child care responsibilities make it more suitable for women to concentrate in roles that are easily interruptible because infants and children are the source of frequent interruptions. Roles that are easily interruptible are usually ones that involve lower levels of skill and training. Roles that are dangerous are much better suited for men because of the need to keep infants and children away from danger as much as possible. In short, the sexual assignment of work roles seems to

be carried out in such a way as to promote the well-being of infants and children and thus the inclusive fitness of their parents.

In terms of sexual inequality, we find a widespread, indeed a universal, pattern in which

- the institutional sectors of human societies are gender asymmetrical;
- males monopolize political leadership;
- males monopolize warfare;
- and males monopolize a society's high-status positions.

William Divale and Marvin Harris (1976) have identified a strong male bias to the institutional sectors of band and tribal societies. Marriage and kinship patterns, for example, are markedly biased in favor of males. Patriline, the tracing of descent ties through males, is much more common than matriline, the tracing of descent ties through females. Patrilocal and virilocal, marital residence practices centered around men, are much more common than matrilocality and uxorilocality, residence practices centered around women. Marriage practices are also highly male biased inasmuch as polygyny is much more common than monogamy and polyandry. The contrast between polygyny and polyandry is particularly stark. About 85 percent of the world's societies permit polygyny, but less than one percent of the world's societies practice polyandry (Murdock, 1967). Sexual asymmetry is especially characteristic of the ideological sectors of band and tribal societies. Beliefs in the inferiority of females are widespread, and in many societies women are regarded as sources of evil and pollution. Legendary heroes outnumber legendary heroines, and in the realm of religion male gods outnumber female gods. Sexual asymmetry is also apparent in the widespread preference for male rather than female children. Sexually asymmetrical institutions are by no means restricted to band and tribal societies, for societies at more advanced evolutionary stages often reveal new forms of male-biased institutions. Agrarian societies have in many ways the most male-biased social arrangements of any of the major types of human societies, and industrial societies, although considerably less male biased than agrarian societies, still have noticeable male biases to many of their institutional sectors.

Political leadership and warfare are features of human societies that are almost totally under male control (Goldberg, 1993). In every known society, past and present, political leadership has been predominantly or even exclusively in the hands of men (Low, 1992). In hunter-gatherer societies there are headmen but no headwomen, and in small-scale horticultural societies there are political leaders known as "big men" but there are no "big women." Among the legendary Iroquois, influential females known as matrons had the right to veto the appointment of men to political office, but these offices were open only to men. In more advanced horticultural societies powerful leaders known as chiefs are invariably men. In agrarian societies, kings greatly outnumber queens, and emperors outnumber empresses. Martin King Whyte (1978) examined political leadership in 93 of the societies in the Standard Cross-Cultural Sample (Murdock and White, 1969), a highly representative sample (N = 186) of the full range of preindustrial societies (henceforth abbreviated as SCCS). In 65 of these societies political leadership was exclusively in the hands of men. In most of the others women had some involvement in political leadership, but still took a considerable backseat to men. In only two societies were women said to be holding positions that gave them political power equivalent to men, but men were still found in these positions in greater numbers than women.¹ In modern industrial societies the executive and legislative branches of government are strongly male dominated, and all modern nation-states are overwhelmingly led by men. Vincent Falger (1992:171) reports that on

June 14, 1992, at the end of the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro, pictures were taken of the largest collection of heads of state and government ever together in world history. Of the 99 persons shown, only two were women. This is a representative image of the role and position of women in international politics. A like photograph of 65 leaders, assembled in Jakarta on September 1, 1992, at the occasion of the opening of the tenth summit conference of the movement of non-aligned countries, depicts only one woman. The number of female foreign secretaries, ministers of defence, finance, international trade or economic affairs, to mention five other highly "international" top positions in politics, is to be counted on the fingers of two hands. Descending the ladder of political and official positions

with a highly international profile, the number of women does rise, but proportionally they are still virtually absent. Tens of years of democratisation and emancipation have hardly, if at all, changed the long history of nearly complete male domination in top political positions, whether elected or not.

Tatu Vanhanen (1992) has reported on the female composition of the national parliaments of 122 contemporary nation-states. In the 1980s, women constituted only 9.9 percent of the members of these parliaments.

As for warfare, this is even more completely dominated by men. In no society have women been the principal warriors, and in most societies women have no involvement in war at all. Some societies even go so far as to prohibit women from gazing at or handling the weapons of war (Divale and Harris, 1976). In examining 70 societies from the SCCS, Whyte (1978) found that in 89 percent only men engaged in any fighting. In the rest, women may have provided aid but men did most of the fighting.

In all known societies, men also monopolize their society's high-status occupational roles, whatever those roles turn out to be (Goldberg, 1993). Moreover, as these roles change in status level, their sexual composition changes. As roles lose status over time, they are increasingly abandoned by men and increasingly pursued by women. In American society in the 1950s, for example, bank tellers were predominantly male, but today they are overwhelmingly female.

EXPLAINING THE GENERAL PATTERN

These gender patterns only make sense from a biomaterialist point of view. An early proponent of a biomaterialist theory of gender universals was Pierre van den Berghe (1973). Van den Berghe made extensive use of studies of primate societies, on the basis of which he speculatively reconstructed hominid evolution. His basic argument was that humans have inherited from their hominid ancestors a basic "biogram" that predisposes men to hunt, to make war, and to protect the group, and women to nurture children. One of the most vigorous advocates of a biomaterialist understanding of gender is Steven Goldberg (1993), who is primarily concerned with explaining why men everywhere monopolize the political leadership and high-status positions of their societies. Goldberg concentrates on hormone differences between the sexes, pointing out that adult males have testosterone levels about 10 times as high as those of adult females. Testosterone is known to be closely linked to aggression and to dominance and competitive behaviors. Women are at a natural disadvantage in the competition for positions of leadership and high status. Goldberg is particularly insistent on the true universality of greater male attainment of leadership roles and high-status positions. Not a single society known from sociological, anthropological, or historical research, he says, constitutes an exception to this generalization. As he points out, it would take only one exception to falsify his theory, but no exception has ever been found. A number have been proposed, but when Goldberg subjects these to more careful scrutiny they all collapse.

Most sociologists reject these ideas, and the standard sociological interpretation of gender roles is that they are social and cultural constructions that are transmitted intergenerationally via the socialization process. But van den Berghe and Goldberg would respond that little boys are taught to be aggressive and little girls are taught to be nurturant because little boys *really are* naturally more aggressive and little girls *really are* naturally more nurturant in the first place. Socialization patterns, they would insist, simply represent social conformation to a basic biological reality that is easily recognized by people in all societies. As we will see, this logic is extremely well supported by empirical evidence.

Goldberg's work is important and it rings true, but it is severely limited by a failure to place its argument within a more general evolutionary framework. Van den Berghe (1997:3) comments to the effect that Goldberg "fails to see that male behavior is incomprehensible except conjointly with female behavior, and that sexual dimorphism in size, behavior, physiology, and indeed, everything, is only understandable within the evolutionary paradigm of sexual selection, parental investment, and fitness maximization." Another way of putting this is to say that Goldberg remains at the level of proximate causes and fails to link them to their ultimate causes. As van den Berghe would put it, men have higher levels of testosterone

because of the action of sexual selection throughout hominid history. As we saw in Chapter 11, at the heart of sexual selection in humans is male control over female sexuality in order to maximize the male's reproductive success. This is the starting point for understanding the origins of male domination (Smuts, 1995; Buss, 1996; Hrdy, 1997).

Sexual selection should have produced systematic differences between the sexes that are highly adaptive from the standpoint of maximizing each sex's reproductive success, and this appears to be exactly what it has done. Differences between the sexes in levels of aggression have been reported for most mammals (Parker and Parker, 1979). Male mammals are usually shown to be considerably more aggressive than female mammals, and among humans' closest relatives, nonhuman primates, males are usually reported to be more likely to engage in rough-and-tumble play and dominance behaviors; these differences begin very early in life and continue throughout the organisms' lifetimes, as they do in humans. Studies of many mammalian species show that testosterone is strongly implicated in aggressive behavior. In rhesus monkeys, for instance, aggressive and dominance behavior is more common in animals with higher levels of testosterone, and such animals are less likely to display "maternal" forms of behavior. Injecting female monkeys with testosterone increases their levels of aggression and dominance, and such females display sexual behavior typical of males, such as mounting other females. Studies of human development show the same basic patterns (Parker and Parker, 1979; Money and Ehrhardt, 1972). Females with above normal levels of the male sex hormone androgen develop differently from other females. In addition to being more aggressive, they exert more energy, more commonly select males rather than females as companions, are less interested in playing with dolls, are more likely to be described as tomboys, and have more interest in occupational careers. Kingsley Browne (1995) points out that aggressiveness is one of the most persistently observed differences between the sexes. In fact, it appears to be universal (cf. Geary, 1998). A search for societies in which women are as aggressive as, or more aggressive than, men has proved fruitless. The greater aggressiveness of men is strongly confirmed by data on homicides. Daly and Wilson (1988) have compiled data on homicide rates in industrial societies and in many other types of societies throughout the world. They compare the rate at which men kill men with the rate at which women kill women. There is an overwhelming predominance of men killing men. In several societies 100 percent of the homicides involved men killing other men, and in no society did the rate drop below 85 percent. On average, 96.4 percent of the homicides involved men only.

Men also tend to show much more competitive behavior in societies throughout the world. Many studies have shown that girls and women behave much more cooperatively in a wide variety of societies. As Browne (1995:1026) has said, "In our ancestral environment, women enhanced their reproductive success by cooperating with sisters and co-wives, situations in which they gained no reproductive advantage through open conflict or changes in coalitions. Men, on the other hand, enhanced their reproductive success by cooperating with male relatives and nonrelatives at times, and competing with them at times. Dominance assertion in male groups is more likely to lead to enhanced reproductive success than it is in female groups." What is true of aggressiveness and competitiveness is also true of risk-taking behavior: Men are much more likely to engage in it than are women. In industrial societies men are much more frequently involved in car accidents and in such risky leisure-time activities as car racing, sky diving, hang gliding, and gambling (Browne, 1995). The greater risk-taking behavior of men is abundantly apparent from preindustrial societies. Two of the most risky behaviors in these societies have been big-game hunting and warfare, and men have virtually totally monopolized these activities.

Where women have a huge edge over men is in activities that involve nurturance and empathy, especially maternal behavior. Browne (1995) refers to numerous studies which show that women are more empathetic than men and are in general more "people oriented." Women are more concerned with interpersonal relations and their maintenance. Geary (1998) summarizes studies reporting that children, especially very small children, spend far more time in proximity or contact with their mothers than with their fathers. In one of these studies (Whiting and Whiting, 1975), children in Kenya, India, Mexico, the Philippines, Japan, and the United States were in proximity or contact with their mothers approximately seven and a half times as much as with their fathers. Whiting and Edwards (1988) found a similar pattern in follow-up studies of children in Africa, South Asia, South and Central America, and North America.

Among the !Kung San, who perhaps come closer to gender equality than any society in the world, fathers provide less than 7 percent of the care of children under two years of age (Geary, 1998). Among the Aka Pygmies, fathers held their infants an average of 57 minutes a day whereas mothers held them an average of 490 minutes a day (Geary, 1998). Liesen (1995) reports on a cross-cultural analysis of parental behavior in 80 preindustrial societies (Katz and Konner, 1981). It was found that in 59 percent of these societies fathers rarely or never spent time with their infants. Even in the societies in which fathers were most likely to spend time with their children, fathers contributed only 6 percent of direct parental care, and only 14 percent of their time was spent interacting with their children. In Western societies when fathers interact with children it tends to be in terms of playing physical games with them, not providing parental care (Liesen, 1995). Evidence also indicates that girls spend much more time play parenting than boys (Geary, 1998). Interestingly, "the finding that early play parenting substantially improves the survival rate of firstborn offspring in many species of primate suggests that this form of play has evolved by means of natural . . . selection" (Geary, 1998:236).

Alice Rossi (1977, 1984) has summarized evidence showing that compared to males females show greater sensitivity to touch, sound, and odor; have greater fine motor coordination and finger dexterity; pick up nuances of voice and music more readily; are more sensitive to context; and are more attracted to human faces. These traits are precisely ones that would contribute heavily to the successful rearing of a small infant. Rossi notes that, because of long infant and child dependency, prolonged infant care through intense attachment of the mother and the infant is critical to human survival, and that in hunter-gatherer societies there is extremely close contact between mother and infant and infants are nursed for as long as five years. Under such conditions, it is almost inconceivable that the female of the species would not have been selected for strong nurturant tendencies.

A great deal of evidence has also accumulated that strongly suggests there are innate differences between men and women in cognitive skills. It has long been known that in all industrial societies men score higher on tests of mathematical and spatial ability, whereas women score higher on tests of verbal skills. Many studies have shown that males tend to score higher (often much higher) on tests involving route finding, maze running, and the mental rotation of objects, whereas females score higher on tests involving remembering the locations of objects. These differences have been found in a variety of human societies and in numerous other mammal species (Kimura, 1987, 1992; Gaulin and FitzGerald, 1986, 1989; Gaulin and Hoffman, 1988; Silverman and Eals, 1992; James and Kimura, 1997; McBurney, Gaulin, Devineni, and Adams, 1997; Moffat, Hampson, and Hatzipantelis, 1998; Dabbs, Chang, Strong, and Milun, 1998). According to Doreen Kimura (1999:62), "The evidence is now quite clear that the male advantage on imaginal rotation tasks found in Western cultures is practically universal." As she notes, this advantage has been found among African peoples and among East Indians and other Asians. In a fascinating article, Gaulin and FitzGerald (1986) theorize that these differences are shaped by sexual selection, not only in humans but in many species of mammals as well. They argue that, since males are commonly polygynous, they evolved strong spatial abilities in order to navigate over large territories in search of mates. They tested this claim by looking at two different species of voles, one polygynous (meadow voles) and the other monogamous (pine voles). In the polygynous meadow voles, males ranged much farther from home than females, whereas in the monogamous pine voles there were no such sex differences; and in the polygynous voles, males significantly outperformed females in a maze-running task, whereas in the monogamous voles the sexes' maze-running abilities were the same. In a second study, Gaulin and FitzGerald (1989) found that male polygynous meadow voles expanded their navigational ranges only when the breeding season arrived and only after they had reached the status of full reproductive adults. Female meadow voles' navigational ranges remained the same under these different conditions. By contrast with the male meadow voles, male monogamous prairie voles did not expand their ranges during the breeding season or after they reached full reproductive status. Studies of other mammals have provided additional support for Gaulin and FitzGerald's argument concerning the role of sexual selection (Sherry, Jacobs, and Gaulin, 1992; Gaulin, 1995).

In a third study, Gaulin (1992) tested the alternative hypothesis that the observed sex differences in spatial ability are the result of differences in spatial experience rather than differences in brain organization.

Gaulin removed prairie vole offspring of both sexes from their wild parents and reared them under laboratory conditions in which they were severely deprived of spatial experience (their ability to move about was curtailed by putting them in small cages). Their maze performance when they reached adulthood was then compared to that of their wild parents. No significant difference was found between the maze-running abilities of the spatially deprived voles and that of their spatially experienced parents. Thus, spatial experience had no effect on spatial ability.

In attempting to generalize his findings on voles to humans, Gaulin (1992) notes that, while detailed systematic study is lacking, there is nonetheless considerable evidence to suggest that in preindustrial human societies males usually have larger navigational ranges, and most preindustrial societies are polygynous. Ethnographers have often remarked that males range much wider than females. This is known to be the case for such societies as the Yanomamö, the Ifaluk, Trinidad, the Kipsigis, and the Aka Pygmies. The best data are available for the Aka Pygmies (Hewlett, van de Koppel, and Cavalli-Sforza, 1986; cited in Gaulin, 1992). It was found that in this society males not only had larger navigational ranges than females, but there was a positive correlation between the size of males' exploration ranges and the size of their mating ranges.

A different interpretation of the causes of sex differences in spatial ability has been offered by Silverman and Eals (1992), who link the differences to the demands of hunting and gathering in the ancestral environment. Tracking and killing animals over large distances would have favored precisely the kinds of spatial abilities at which men excel, they claim, whereas the demands of gathering would have selected for the ability to remember the locations of clumps of plants, the ability at which females outperform males. It is not yet clear which of these scenarios is the more accurate, or, indeed, whether a choice must be made. It could well be that both kinds of demands have operated on humans, thus overdetermining male spatial abilities. (In a personal communication, Gaulin reports that he intends to test these two models directly against each other by using another species, chimpanzees. Unlike voles and humans, male and female chimpanzees do not differ in foraging patterns, but they are sexually dimorphic and males mate with many females. Thus, they would appear to constitute an ideal test.)

There is also hormonal evidence suggesting an innate foundation to sex differences in cognitive skills. As Gaulin and Hoffman (1988:137) note, "sex differences in spatial ability become much more pronounced at adolescence and then decrease in middle age, thus paralleling the pubertal peak and subsequent decline in sex hormones." Research has shown that women receive lower spatial test scores when they are ovulating, which is when their estrogen levels are at their peak, and higher scores when they are menstruating, which is when estrogen levels are normally at their lowest level (Kimura, 1999; Gaulin, Silverman, Phillips, and Reiber, 1997). Moreover, various kinds of hormonal disorders are often associated with anomalies in cognitive skills. For example, males suffering from the disease known as kwashiorkor often have elevated estrogen levels, and such males have been found to be below normal in spatial ability (Gaulin and Hoffman, 1988). Idiopathic hypogonadotropic hypogonadism (IHH) is a hormone disturbance in which males have small genitals and abnormally low testosterone levels. Such males score lower on spatial abilities than normal males, and often even lower than males who develop a testosterone deficiency later in life (Kimura, 1999). Another hormone anomaly is congenital adrenal hyperplasia (CAH), which occurs in both males and females. This is a condition in which the adrenal glands produce too much androstenedione, a testosterone-like hormone. Girls with this condition have been found to score higher on spatial tests of rotation, visualization, and disembedding abilities, tasks on which males normally score much higher than females (Kimura, 1999).

The typical sociological claim that the various patterns discussed above have been produced by differential socialization of the sexes is implausible in the extreme given the extraordinarily widespread or even universal nature of the patterns. As Kingsley Browne (1995:1050) has argued, "Cross-cultural uniformity is difficult to explain without reference to some underlying component of the human psyche. If this uniformity occurred through independent invention in each culture or group of cultures, the question is why did culture after culture come to the same independent conclusion? The most likely answer would be that there is something about our nature that leads us to come consistently to the same answer." Browne's point is extremely difficult to refute. If socialization is the cause of greater male domination of political

leadership and monopolization of high-status positions, greater male aggressiveness, competitiveness, and risk-taking, and the cause as well of the nurturant and empathetic orientations of females, and if the socialization process is itself essentially uncaused or arbitrary, then what we should find in the full range of the world's societies is essentially this: About a third should be led by men, another third by women, and the remaining third by both men and women; about a third of the world's societies should make women the primary child care providers, another third should give men this role, and the final third should assign this responsibility to both men and women equally; and so forth and so on. But this is not even remotely what we find.

Moreover, differential socialization cannot be the cause of these differences if in fact there really is very little differential socialization of the sexes taking place. David Geary (1998) points out that studies carried out in Western societies indicate that parents actually treat boys and girls in very similar ways with respect to such broad areas of socialization as encouragement of achievement, warmth and nurturance, encouragement of dependency, restrictiveness, disciplinary strictness, encouragement of sex-typed activities, and clarity of communication. The most comprehensive assessment of these studies is that of Lytton and Romney (1991), who examined 172 studies involving 27,836 subjects. The one exception seems to be that fathers discourage boys from playing with dolls and other girls' toys. However, it is likely that this difference is simply a parental reaction to differences in boys' and girls' behavior, or to parental concern about sexual orientation, since the doll play of boys is highly correlated with a later gay orientation. Geary also points to a review of evidence (a summary of 81 studies by Barkley, Ullman, Otto, and Brecht, 1977) showing that it is very unlikely that these differences between the sexes result from children selectively imitating the same-sex parent. Girls tend to imitate feminine behavior whether it is displayed by a woman or a man, and boys tend to imitate masculine behavior regardless of the sex of the person displaying it.

Finally, the biomaterialist argument being presented here is also strongly supported by one of those infrequent natural experiments, in this case involving the Israeli kibbutzim (Tiger and Shepher, 1975; Spiro, 1979). These communal settlements were established early in this century by Eastern European Jews with a Marxist ideological outlook. An attempt was made to abolish the "bourgeois family" and traditional gender roles. In the first generation women and men shared fully in domestic and agricultural tasks and by and large enjoyed a condition of gender equality. When children were born they were reared in a communal nursery by professional nurses rather than by their natural parents, and children merely visited occasionally in their parents' apartment. However, by the third generation this pattern had clearly unraveled. Women were increasingly concentrated in traditional gender roles, such as domestic work, laundering, and cooking, and men took over agricultural and industrial work. Women also disappeared from political leadership, this being taken over by men. Parents became increasingly dissatisfied with the limited contact they were permitted with their children. Mothers in particular demanded greater opportunities to be with their children and to participate in rearing them. Gradually the traditional nuclear family was reestablished, and mothers became the primary child care providers. A reasonable conclusion from all this is that the kibbutz experiment was inconsistent with human biology and as a result social patterns changed to conform more closely to humans' natural biological predispositions.

The biomaterialist understanding of gender should not be seen as somehow opposed to feminism as a political approach. Many sociobiologists are women, and most of these are in fact feminists of one type or another. (To name just a few: Margo Wilson, Laura Betzig, Barbara Smuts, Jane Lancaster, Sarah Blaffer Hrdy, and Monique Borgerhoff Mulder.) Sociobiologists, whether male or female, do not try to use sociobiology as an argument against the push for gender equality. They do not try to justify the gender status quo. Tatu Vanhanen (1992), for example, interprets the overwhelming male monopolization of political leadership in biomaterialist terms, but he nonetheless argues that women in modern societies should work for equality and he prefers it to inequality. In fact, some sociobiologists have tried to show that sociobiology and feminism are highly compatible, and, in fact, are sometimes saying much the same thing (Smuts, 1995; Hrdy, 1997; Buss, 1996; Gowaty, 1992; Buss and Malamuth, 1996; for a dissenting voice see Tang-Martinez, 1997). Both Barbara Smuts (1995) and Sarah Blaffer Hrdy (1997) see male domination (or patriarchy, as they prefer to call it) as rooted in sexual selection, as I have been arguing all along. Smuts,

Hrdy, and others recognize that “biology is not destiny,” and that we can change the gender status quo if we desire.

Sociobiologists and feminists agree on several basic points: that men tend to control resources and power everywhere; that men frequently control women by way of their control of resources; that the control of women often centers on female sexuality; and that men often think of women as sexual property (Buss, 1996). But feminists and many sociobiologists would argue that there is nothing inevitable about any of these things. Based on her sociobiological analysis of gender relations, Smuts (1995) offers the following proposals for creating greater gender equality in modern societies:

- Male domination is greater where male-male coalitions are strong and female-female coalitions are weak. Therefore, to reduce male domination women should work to build strong alliances with each other.
- Male domination is greater where males control important resources, especially economic resources. Therefore, women should work for greater economic opportunities and legal protection of their property rights.
- Male domination is greater where the inequalities among males are greater. Therefore, women should work for economic and political changes that would reduce inequalities among males.
- Women often contribute to the perpetuation of male domination in various ways. For example, women prefer as mates men who are rich in resources, which promotes inequality among men. Therefore, women can help to dismantle male domination by changing the way they respond to the characteristics of males.

Smuts argues that the characteristics listed above that intensify male domination are elaborations, within specific environments, of the basic male reproductive strategy. They vary considerably from place to place, and thus have a considerable amount of free play. Of course, most of these changes will be a lot harder to make than to propose. For example, getting women to change their preference for resource-rich males, a preference strongly built into the human biogram, will be very difficult. Nonetheless, the point is made that sociobiology and feminism need not be at odds.

CROSS-CULTURAL VARIATIONS IN THE STATUS OF WOMEN

Despite the overall pattern that we have been discussing, the status of women varies significantly from one society, and one type of society, to another, and it is difficult to explain these differences biomaterialistically. Let us look at the ecomaterialist and polymaterialist alternatives.

Polymaterialist interpretations of gender inequality have been presented by William Divale and Marvin Harris (1976; Harris, 1977) and by Randall Collins (1975, 1985b). Divale and Harris have identified a pervasive male supremacist complex in band and tribal societies and have linked it directly to the practice of warfare. They say that, whenever warfare occurs in band and tribal societies (which it does very frequently), a distinct survival advantage is given to those societies that can rear the most fierce and aggressive warriors. “Given warfare,” they say (1976:526), “males rather than females are trained to be fierce and aggressive because in hand combat with muscle-powered weapons the average height and weight advantage of males is decisive for individual and group survival.” To make males as fierce and aggressive as possible, male qualities are greatly exaggerated and female qualities denigrated. Women will be part of the reward for military bravery (through such practices as polygyny), and they will be reared to be passive and to accept the authority of males. Collins has developed a similar theory to explain male domination in any society, but especially in agrarian societies. Collins notes that men in many societies have often gone to great lengths to monopolize the weapons of war. Where these weapons are little developed and there is little or no military threat, men will have little incentive to organize themselves into military groups, and the relations between men and women will tend to be egalitarian. But where military weapons are well developed and there is constant fighting, men will be highly organized into cohesive military groups. This will drive a wedge between men and women and produce marked female subordination.

Martin King Whyte (1978) and I have independently tested the basic logic of this polimaterialist argument. Whyte created a large number of gender status variables for half of the SCCS, and selected 10 of these for cross-tabulational analyses with a variety of independent variables. Only three of the gender status variables turned out to be reliably and consistently correlated with the independent variables: the level of female domestic authority, the existence of female solidarity groups, and the degree of male control of female sexuality. The extent of warfare was correlated with these variables, *but in the wrong direction*. Warfare correlated .44 (gamma) with domestic authority, .36 with female solidarity groups, and .14 with control of female sexuality. These findings not only fail to support the militarism hypothesis, but actually show that warfare is associated with a *higher* rather than a lower gender status.

My own analysis of the SCCS data also strongly contradicts the militarism hypothesis. Overall warfare frequency correlated only -.049 (Pearson r) with female domestic authority, .104 with female solidarity groups, and -.096 with control of female sexuality. When internal and external warfare were separated, the correlations were essentially the same. No matter which study's results are more reliable, Whyte's or mine, both disconfirm the militarism theory of male domination. Because Harris's version of the theory pertains to band and tribal societies, and because Collins is thinking mainly of large-scale agrarian societies, additional correlations were computed separately for three different types of societies. In the case of foraging societies, overall warfare frequency correlated -.324 with female domestic authority, which is consistent with the militarism hypothesis. However, it correlated .243 (.494 in the case of external warfare) with female solidarity groups, and .248 (.517 in the case of internal warfare) with control of female sexuality, correlations that run in the opposite direction from that predicted. For horticultural societies, female domestic authority and control of female sexuality were uncorrelated with warfare, but female solidarity groups correlated .454 with overall warfare frequency, a correlation that once again runs in the wrong direction. Finally, for intensive agricultural societies, there was a correlation running in the wrong direction between overall warfare frequency and control of female sexuality ($r = .382$, .549 for external warfare), and warfare did not correlate with the other two gender status variables. On the whole, these results require us to reject the militarism hypothesis.

Important ecomaterialist theories of societal variations in gender inequality have been formulated by Friedrich Engels (1970[1884]), Karen Sacks (1975, 1979), Kay Martin and Barbara Voorhies (1975), and Rae Lesser Blumberg (1984) (cf. Chafetz, 1984). Engels's theory, developed in the late nineteenth century, was, unsurprisingly, Marxian in nature. Engels thought that societies prior to the rise of private property, social stratification, and the state were ones in which the sexes were essentially equal. With the emergence of stratification and the state, men gained control over property and used this control to subordinate women. Thus was patriarchy born. There are at least two major problems with this theory. First, little known to Engels, classless and stateless societies are all male dominated, some of them highly so; and second, Engels never tells us why it should be men, rather than women or both men and women, who tended to control private property once it had arisen. Despite the problems with this theory, however, a modified version, one holding that the status of women has at least *declined* throughout social evolution, might be workable.

Karen Sacks (1975, 1979) has developed a modern version of Engels's argument. She argues that the evolutionary decline in the status of women has been most closely associated with the increasing exploitation typical of societies at more advanced stages of societal development. Because men did not have to rear children, they could be more intensively exploited than women, and thus were selected by ruling classes for economic tasks outside the home. As a result, women came to be slunted off into the household where they concentrated on domestic work and child rearing. This set the stage for a dramatic decline in women's status; they came to be defined as dependent wards of men and less than full adults. Like Engels, Sacks is probably correct in seeing at least a decline in women's status with social evolution, but it is not clear that this necessarily has anything to do with the aims and goals of ruling classes. With the rise of stratification and the state, the demands of agricultural work would have become greater with or without the actions of a ruling class, and thus it would have fallen largely into the hands of men.

Martin and Voorhies (1975) argue that gender roles are adaptive results of underlying economic, technological, and economic arrangements. The gender division of labor will reflect the suitability of each

sex to particular tasks within the framework of a society's overall mode of production. For example, men are better suited to hunting in hunter-gatherer societies because they are not the primary child care providers, and women are better suited to gathering because it is more compatible with child care. In agrarian societies, men will take control of economic production because of its time, energy, and strength requirements, and because women are vitally needed for reproductive and household roles. Once the sexual division of labor is set, the extent to which men control production will determine their degree of power and dominance over women.

Rae Lesser Blumberg (1984) has proposed a similar argument, holding that the most important factor determining the status of women in the world's societies is women's *level of economic power*. Economic power is a major resource that can be used by women to advance their interests, and thus the more economic power women have the higher their status with respect to men. What factors determine women's level of economic power? Blumberg proposes three: the strategic indispensability of women's labor, the organization of the kinship system, and the nature and extent of the stratification system. Women's labor is indispensable if they make an important contribution to total household subsistence needs, if they perform tasks that require considerable technical expertise, if they are relatively free from male supervision, and if they are organized into cohesive work groups. In terms of the kinship system, matrilineal and matrilineal societies lead to more economic power for women because of women's greater involvement in property ownership and management. As for the stratification system, Blumberg argues that the more intensive and elaborated it is the lower women's level of economic power. Blumberg stresses that economic power not only increases women's status – the positive regard and respect for them on the part of men – but also gives them more autonomy, or a greater ability to manage their lives free from male control. Or, to use Blumberg's term, economic power gives women more "life options" – more ability to control sexuality, reproduction, household affairs, marriage, divorce, and overall mobility.

An examination of the evidence shows strong support for these ecomaterialist arguments. It is hunter-gatherer societies that for the most part give women the highest status and greatest degree of autonomy, and these societies are ones in which women make a major contribution to subsistence. Women are the principal gatherers, often contributing more than half of the total food that everyone will eat, and they are able to capitalize on this resource control. In fact, the status of women among hunter-gatherers appears to vary in accordance with how much they contribute to subsistence (Friedl, 1975). For example, among the !Kung San the gathering contribution of women is a major contribution to the diet (perhaps as much as 60-80 percent of the total food intake), and the !Kung come about as close to a gender egalitarian society as there is. Women are able to express their views on all topics and are generally not subjected to the kinds of sexual stereotypes, taboos, and restrictions that are common in many other societies. Women seem to enjoy a considerable amount of autonomy and, apparently, have high self-esteem. The Eskimo, whose diet consists mostly of food provided by men through hunting, are, by contrast, a highly male-dominated society (Friedl, 1975). Women are treated as sex objects and commonly subjected to male violence.

Horticultural societies, like hunter-gatherer societies, are ones in which women still make an important contribution to subsistence. In most horticultural societies women are the principal cultivators (Martin and Voorhies, 1975). Men usually prepare the garden sites for planting, but then the women commonly take over from that point. For this reason, Ester Boserup (1965, 1970) has called horticultural societies "female farming" societies. It is difficult to generalize about horticultural societies because they exhibit a wide range of female status. However, it is probably fair to say that most horticultural societies are much more male dominated than hunter-gatherer societies. At one extreme are the Yanomamö (Chagnon, 1983), who are one of the most male dominated societies in the world. Among these people, men control virtually every sphere of social life. Men hunt and control horticultural production. In addition to their complete domination of politics and warfare, men also dominate religious life. Part of their religious ritual involves men blowing a hallucinogenic drug up each others' noses, and women are completely excluded from this activity. Yanomamö men are extremely noteworthy for their aggressiveness and the violence they direct toward women, which includes frequent gang rape. Near the other extreme are the Iroquois, who in

recent centuries inhabited parts of western New York state and adjacent parts of Canada (J. Brown, 1975). Although official positions of political leadership were in the hands of men, women had veto power over the men who were appointed to these positions. The Iroquois were a matrilineal and matrilocal society, and thus land was in the hands of women. As a result, women had considerable influence over the affairs of their domestic groups. Women were also significantly involved in religious ritual. Iroquois men spent a great deal of time away from home engaged in warfare and hunting, and women had considerable autonomy.

As Blumberg has suggested, among horticulturalists the status of women is significantly affected by kinship patterns. In patrilineal societies, land is owned and inherited through males in their roles as fathers, and women become economic producers in kin groups that are controlled by their husbands. In these societies women ordinarily have very low status. A husband will acquire rights in a woman as a childbearer, and the woman's offspring belong to the father and his patrilineage. Among matrilineal horticulturalists, women are the focus of the kinship system, with men tracing their genealogical links through their mothers and sisters. Land is owned matrilineally, and women's economic production contributes to their own kinship group rather than to that of their husbands. Because of these things, women fare better in matrilineal than in patrilineal societies.

Among all the major types of human societies, it is in agrarian societies that the status of women reaches its depths. In the transition from horticultural to agrarian societies, major changes took place in technology and economic life (Martin and Voorhies, 1975). With the shift to much more land- and labor-intensive forms of agrarian cultivation, the role of women as economic producers was greatly reduced, and economic production came to be dominated by men. As men took control of production, women became "domesticated" - assigned to the household and the activities connected with it. There emerged what Martin and Voorhies have called the "inside-outside dichotomy," which involved the division of social life into two distinct realms. The "outside" sphere includes those activities that occur outside the home, such as economics, politics, religious life, and education. The outside sphere is a male sphere. The "inside" sphere is, by contrast, a female sphere, and involves activities that occur within the home, mainly cooking, cleaning, laundering, and the nursing and rearing of children. With the emergence of the inside-outside distinction, men and women came to live in dramatically different worlds, and elaborate sexist ideologies emphasizing the natural inferiority of women spread widely. It is not an exaggeration to say that the rise of the inside-outside dichotomy was associated with the descent of woman to the nadir of her socially assigned inferiority.

In many agrarian societies women have been veiled and secluded and much of their movement and many of their activities have been sharply restricted (Martin and Voorhies, 1975; Mandelbaum, 1988). They have been forbidden to own property, to engage in politics, to pursue education, or to initiate divorce. Many agrarian societies have made women legal minors and dependent wards of men. Agrarian societies are well known for their tight controls over female sexuality. Many have demanded premarital virginity on the part of girls, and premarital and extramarital sex have been severely punished. Agrarian societies have also frequently embraced the forms of genital mutilation known as clitoridectomy and infibulation, practices which indicate that women in these societies are extreme forms of sexual property. By contrast, agrarian societies have permitted and even encouraged nonmarital sexual activity for males. While all societies appear to have a sexual double standard favoring men, this standard is more elaborately developed in agrarian societies than in any other.

There has been a great deal of debate concerning whether the rise of capitalism and industrialism has improved or worsened the status of women (J. Thomas, 1988). Many social scientists, Marxists in particular, have portrayed capitalism as having a negative impact on the overall status and life situation of women (J. Thomas, 1988; Tilly and Scott, 1978). My view, however, is that the evidence strongly supports the notion that women's situation has for the most part improved since the advent of capitalism. Women have, for example, essentially achieved political and legal equality with men and are no longer regarded simply as legal minors and dependent wards of men. Compared to women in nearly all agrarian societies, as well as to women in many horticultural societies, women under capitalism have realized a dramatic

improvement in their status and in their capacity to control their own lives free from male control. This improvement may have begun as early as the eighteenth century (Shorter, 1976). After this time women frequently became employed in cottage industries and small-scale factory work, and this employment increased their power and autonomy and improved their status. As Shorter notes, as a result of their new work roles, women gained control over an extremely valuable resource, money, and “the weekly wage packet turned into a weapon in the struggle for domestic power” (1976:520). For the most part the changes in women’s status occurred among peasants and workers rather than the middle and upper classes, and for these latter groups the situation was different. However, most women during this time belonged to the peasant and working classes.

These changes in women’s status with the shift from agrarian to industrial societies cry out for ecomaterialist explanation. Before the Second World War many single women were in the labor force, but very few married women were. But after the War, there was a veritable flood of married women, including those with small children, into the labor force. In 1948 only about one married woman in nine was in the U.S. labor force (U.S. Department of Commerce, 1975), but by 1980 the percentage had increased to 45 percent and by 1995 it had risen to nearly 64 percent (U.S. Bureau of the Census, 1996). Marvin Harris (1981) has linked the rise of feminism and the women’s movement since the 1960s to this rapid entry of women into the labor force. Harris claims that women’s labor was increasingly sought by capitalists to fill the rapidly growing number of service and information jobs in the economy. Women also sought employment in order to improve or at least help maintain their families’ standards of living. The increased participation of women in the labor force eventually encouraged in them a feminist consciousness. The movement of married women with children outside the home made them increasingly aware of an entire realm of existence previously little known to them. Moreover, as women came to see how much less they were being paid than men, they came to perceive themselves as victims of economic discrimination, which helped to facilitate a broader consciousness regarding their overall social situation. Thus, the most important twentieth-century changes in women’s status can be linked directly to major economic changes that occurred after mid-century.

Analyses of SCCS data by Martin King Whyte (1978) and myself provide quantitative reinforcement for these qualitative analyses. Using female domestic authority as the dependent variable, Whyte found that it correlated $-.55$ (gamma) with the presence of the plow, $-.55$ with the presence of weaving (a measure of economic differentiation), $-.51$ with the presence of irrigation, $.42$ with the importance of hunting and gathering, and $-.40$ with both the presence of animal herding and the degree of community stratification. Whyte found that female solidarity groups correlated $-.65$ with the plow, $.51$ with hunting and gathering, $-.40$ with the degree of societal complexity, $-.39$ with weaving, and $-.37$ with irrigation. Significant associations were also found for male control of female sexuality, which correlated $-.65$ with the plow, $-.65$ with weaving, $-.55$ with community stratification, $-.51$ with private property, $-.49$ with irrigation, and $-.48$ with the cultivation of grains. These data show that as societies adopt more intensive modes of subsistence, become more economically differentiated, and come to be focused around private property and social stratification the status of women falls substantially. This offers support for a modified version of Engels’s theory. Blumberg’s ecomaterialist interpretation of gender posits that as women gain more economic power their status rises. Perhaps the best operationalization of women’s level of economic power is the extent to which they contribute to subsistence. Surprisingly, Whyte found women’s contribution to subsistence to be unrelated to his gender status variables. It correlated $.00$ (gamma) with female domestic authority, $-.01$ with female solidarity groups, and $.13$ with control of female sexuality.

I have attempted to supplement Whyte’s analyses with additional analyses of the SCCS of my own. I found an additional number of significant correlations between the three main gender status variables and ecomaterialist independent variables. Female domestic authority correlated $-.41$ (gamma) with class stratification and $-.44$ with subsistence type (an ordinal variable ranging from foraging to intensive agriculture using the plow). Forty-seven percent of egalitarian societies gave women high domestic authority, but women had high domestic authority in only 7 percent of the most elaborately stratified societies. And women had high domestic authority in 45 percent of foraging societies but in only 6 percent of intensive agricultural societies with the plow. Female domestic authority also correlated $-.44$ with

patrilocal or virilocal residence. Most importantly, I found that female domestic authority correlated most strongly of all with women's contribution to agriculture (.46). Sixty percent of societies where women contributed 10 percent or less to agricultural production gave women low domestic authority, and in only 7 percent of these societies did women possess high domestic authority. Only 11 percent of societies in which women contributed between 50 and 60 percent of agricultural output scored low on female domestic authority, but women had high domestic authority in 50 percent of these societies. These findings show that women's contribution to subsistence is an important determinant of their status, but it appears to be their contribution to agriculture rather than their overall contribution to subsistence that is important.

The pattern of relationships is much the same when the measure of gender status is female solidarity groups. This measure correlated -.34 with social stratification, -.42 with political role differentiation (a measure of societal complexity), -.52 with patrilineality, -.54 with subsistence type, and .57 with women's contribution to agriculture. A full 55 percent of foraging societies score high on the female solidarity scale as opposed to only 6 percent of intensive agricultural societies with the plow. In the case of the latter type of society, 61 percent score low on the female solidarity scale compared to only 20 percent of foraging societies. As was the case for female domestic authority, the strongest predictor was women's role in agricultural production. Among societies where women do 10 percent of agricultural production or less, 47 percent score low on the female solidarity scale and only 12 percent score high. But where women do 50-60 percent of the agricultural production, 63 percent of the societies score high and none at all score low. Correlations were somewhat weaker when control of female sexuality was the measure of gender status. These correlations were .38 with the importance of gathering, -.42 for subsistence type, .51 for women's contribution to foraging, and -.63 for presence of the plow.

I have attempted to refine these analyses by putting the strongest independent variables into multiple regression equations with each of the measures of gender status. The best predictive model for female domestic authority included women's contribution to agriculture, subsistence type, patrilocal or virilocal residence, and class stratification, with R being .457 and 16 percent of the variance explained. Most of this explanation was generated by two variables, women's contribution to agriculture and class stratification. The results were stronger when female solidarity was used as the dependent variable. Here two variables combined achieved an R of .633 and explained 34 percent of the variance. These variables were women's contribution to agriculture and political role differentiation, with the latter contributing slightly more than the former. The regression analysis for control of female sexuality produced weaker findings. The best model achieved an R of .330 and explained only 7 percent of the variance. The variables included in this model were use of the plow, patrilocal or virilocal residence, and the contribution of women to foraging. Use of the plow was the strongest predictor.⁹

In sum, these analyses show that the most important determinants of variations in the status of women are precisely those factors stressed by ecomaterialist theories. As stressed in Blumberg's theory, women's economic contribution, or at least her contribution to agriculture, looms large. Social stratification and societal complexity are also important, giving at least some credence to Engels's theory. The measures of gender status we have had to work with are not ideal measures by any means, and there is undoubtedly measurement error in the SCCS data. Thus it is likely that these results understate the causal role of ecostructural factors.

ADDITIONAL EVIDENCE

An important study of how both biological predispositions and socialization contribute to gender differences has been carried out by the sociologist J. Richard Udry (2000). Udry studied a sample of women from the Child Health and Development Study, which took blood samples from pregnant women in the San Francisco Bay Area between 1960 and 1969. Samples were collected for every trimester and then frozen for 30 years. In 1990 and 1991 Udry and his research team interviewed many of the white daughters born to these women between 1960 and 1963; the daughters were at that time between 27 and 30 years old. The respondents completed a variety of questionnaires and checklists design to determine their

degrees of femininity or masculinity and their sex role socialization experiences. Udry then looked at the relationship between these sex role orientations and the levels of various sex hormones in the mothers' blood samples when their daughters were *in utero*. Udry found that prenatal levels of sex hormone binding globulin (SHBG) had a strong effect on the daughters' levels of femininity or masculinity when they were adults. SHBG binds testosterone and transports it in the blood, and the higher the SHBG level the lower the level of testosterone. Women who had low prenatal SHBG levels (and thus high prenatal levels of testosterone) were significantly more masculine in their orientations and behavior than women with high SHBG levels (and thus low prenatal levels of testosterone). However, this was true only for SHBG levels during the second trimester of pregnancy; SHBG levels during the first and third trimesters were unrelated to masculinity-femininity. This is an extremely important finding, because it is only during the second trimester that fetal neurological organization is taking place; this is the time when the brain is being "sexed."

Udry found that socialization also played a role in determining levels of masculinity and femininity, but that socialization experiences interacted in an important way with prenatal hormone levels. Women who had low prenatal exposure to androgens were fairly responsive to their parents' socialization efforts; feminizing socialization efforts made them even more feminine, and, presumably, masculinizing socialization efforts could turn their behavior in a more masculine direction. By contrast, women who had high prenatal androgen levels, and thus who tended to be more masculine right from the start when they were young girls, were almost completely resistant to their parents' efforts to encourage feminine behavior. As Udry (2000:450-51) puts it, "the more the parents worked to improve below average femininity, the less successful they were; the more they tried, the less feminine the daughters were in adulthood. Respondent answers indicate that if a daughter has natural tendencies to be feminine, encouragement will enhance femininity; but if she has below average femininity in childhood, encouraging her to be more feminine will have no effect."

It is important to remember that Udry was only studying prenatal hormone levels and masculine vs. feminine orientations and behavior in females. There is obviously much less variation in these variables within the female sex than between females and males. What, then, are the implications for male-female differences in sex role orientations? Udry's answer is that it would be predicted that the much higher levels of prenatal androgens in males – levels about ten times as high as those of females – would not only strongly masculinize their later gendered behavior but would also make them highly invulnerable to the effects of socialization experiences designed to make them more feminine. Males, *simply because they are males*, seem to be highly resistant to feminizing socialization efforts.

Udry pulls his findings together and gives us the following biosocial interpretation of gendered behavior the world over (2000:454):

[B]iology sets limits to the macro-constuction of gender and also sets individual limits to the effects of gender socialization. . . . if the statement, "Gender is a socially constructed device invented by males to exploit females," is treated as a premise, an integrated macro model can explain why it is a male rather than a female invention. Differential female exposure to androgens can explain the differential response of females to their disadvantage. [The fetally most androgenized females should be the most "feminist" in their outlooks and interests.]

Broadening the theory I have sketched here leads toward explanation of the cross-cultural similarities of gender structure while leaving intact the sociological explanation of cross-cultural variation in terms of technology and ecological variation. We can theorize about the escape of exceptional women from even the most stultifying and restrictive boundaries of women's roles while not giving up an inch of constructionist territory in explaining the structure from which they escaped.

A biosocial macro theory is simple: Humans form their social structures around gender because males and females have different biologically influenced behavioral predispositions. Gendered social structure is a universal accomodation to this biological fact. Societies demonstrate wide latitude in this accomodation – they can accentuate gender, minimize it, or leave it alone. If they ignore it, it doesn't go away. If they depart too far from the underlying sex dimorphism of

biological predispositions, they will generate social malaise and social pressures to drift back toward closer alignment with biology [as is clearly indicated in the famous case of the kibbutzim].

Udry believes that his findings have important implications for social change efforts in the direction of greater gender equality. Most critically, they indicate that efforts to resocialize males to be more feminine will have very limited success. Instead, efforts should concentrate on making females more masculine in their life orientations, occupational interests, and so on. This seems to fit extremely well with changes in gender roles over the past 40 or 50 years. Men have changed little, whereas women have changed considerably. Women have become much more like men than men have become like women. (Whether this is a good thing or not depends on one's moral and political values, as Udry himself points out, and is a question that is beyond the scope of this book.) I would only add that, while gender *equality* may be possible, a completely *degendered* society is not. As Udry remarks (2000:454), "A social engineering program to degender society would require a Maoist approach: continuous renewal of revolutionary resolve and a tolerance for conflict." But not only would few people wish to live in such a society; it is likely that such extreme efforts would never, in fact, realize their aim.

NOTES

1. Bobbi Low (2000) remarks that, even with these qualifications, Whyte still exaggerates the political power of women in some societies. Low examines nine societies identified by Whyte as ones in which women have "significant power." She finds that in most of these that is not actually the case. In three of the societies the only evidence was a conversation or rumor. Whyte regards women among the Saramacca as having power equal to that of men, but it is clear upon closer observation that their power was limited to women's affairs. They had only informal influence over men. This seems to be the case in several of the nine societies, and possibly even in all of them.

2. Despite the relatively weak results from the regression analysis involving male control of female sexuality, this is clearly an important dimension of female status and it is clearly related to levels of social evolution. In the *Ethnographic Atlas* (Murdock, 1967), a data bank of 1,267 preindustrial societies, in terms of class stratification, 56 percent of societies with complex stratification demand premarital virginity on the part of girls, but only 18 percent of egalitarian societies demand premarital virginity; and 49 percent of egalitarian societies freely permit premarital sex for girls, but only 9 percent of societies with complex stratification freely permit it. In terms of stage of political evolution, 73 percent of large states demand premarital virginity for girls, but only 21 percent of bands and tribes do so.

We know why men want to control female sexuality, but why should they be able to control it much more in societies at higher stages of social evolution? The answer is probably that women are competing more among themselves for men, especially high-status men, who prefer virgin brides and are in a position to demand them. In societies that are more highly stratified, women want men with resources and will be more likely to give in to male wishes under the circumstances. It is a cost-benefit matter. It is notable that in Islamic cultures senior women put intense pressure on girls to remain virgins. As Barbara Smuts has noted (1995:17), "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."

3. Udry's finding that socialization affects gender role behavior perhaps qualifies but does not contradict the findings of Geary (1998) and Lytton and Romney (1991) discussed earlier that there is little differential sex role socialization now taking place in Western societies. Udry is focusing only on the degree of masculinity or femininity, whereas Geary and Lytton and Romney's focus is considerably broader. They are looking at such things as encouragement or discouragement of achievement, strictness of parental discipline, restrictiveness, and clarity of communication. Differential sex role socialization does occur, but only in certain areas. Moreover, Udry perhaps overstates the importance of sex role socialization for masculinity or femininity because he, like virtually all sociologists, is still caught in the trap of thinking of socialization as something entirely separate from biology. The fact that mothers encourage femininity in their daughters and fathers masculinity in their sons is clearly closely tied to the fact that mothers are themselves already more feminine and fathers are themselves already more masculine. The encouragement of femininity in girls is the norm because mothers recognize that the female sex *really is more feminine*, fathers that the male sex *really is more masculine*. Socialization is itself a biologically driven phenomenon to a very large extent, and the encouragement of femininity in girls and masculinity in boys is a human universal.