

WOMEN IN HUMAN EVOLUTION

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THE PALEOLITHIC GLASS CEILING

Women in human evolution

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INTRODUCTION

In November 1993, the cover of *Discover* magazine featured a striking diorama from the new permanent exhibit "Human Biology and Evolution" at the American Museum of Natural History in New York. Walking alone on the African savanna in the shadow of a vast volcano, a naked couple leave their tracks in the white volcanic ash. When I visited the exhibit, I stood for a long time pondering the evocative and unsettling scene. A deep and disturbing message about gender relations was being telegraphed, but what was it? Finally, I realized that the scene represented a modern – "scientific" – version of Adam and Eve's ejection from the Garden of Eden, with a spouting volcano instead of an angel's fiery sword, driving our ancestors into the unknown. In thinking about this message, I wondered, how far during the last three decades have we really come as a discipline in the ways we depict women (and men), and their roles during human evolution?

In pursuing this question, I begin in the 1950s and continue through the 1960s, 1970s and 1980s and discuss how women have been portrayed in reconstructions of human evolution in reference to two recurrent themes: (1) the sexual division of labor tied to subsistence and hunting and a rigid assignment of "women's roles;" (2) the reproductive-social unit affiliated with "monogamy" and parental care and its constraints on female sexuality and reproductive behavior. The role of women in evolution has undergone a number of permutations, but paradoxically, in spite of challenges to the contrary, the outcomes have resulted in little change. By the time we arrive at the 1990s, anthropologists reach a wide audience through textbooks, television specials and museum exhibits where women in evolution are rendered either invisible nonparticipants or as the handmaidens to men in prehistory. Whether or not there is a conscious effort to keep women in their place, these pervasive attitudes impose a "glass ceiling" on our female ancestors, much like the "glass ceiling" that limits the upward occupational mobility of contemporary women both within and outside of the academic disciplines.

THE 1950s: NEW VIEWS OF HUMAN EVOLUTION

Anthropology has long recognized that the human way of life in subsistence and social behavior has changed over time. Only after the arrival of the evolutionary synthesis in the 1940s and the increasing hominid fossil record did adaptation in human evolution become a systematic focus of inquiry (Bowler 1986). The new evolutionary synthesis integrated the mechanisms of evolution – natural selection and migration with mutation and chance – while rejecting completely all aspects of goal-directed change, or orthogenesis. The consolidation of the evolutionary synthesis within anthropology was marked by a symposium “Origin of Man” held at Cold Spring Harbor in 1950. A key participant, Sherwood Washburn, contributed a great deal toward integrating physical anthropology and the study of human evolution within this new framework (Washburn 1951a). Combining the study of living forms with the fossil record and utilizing new research methods, Washburn helped to shift the discussion of human evolution away from descriptive anatomy and toward an analysis of adaptation (Washburn 1951b).

Two papers published in the 1950s illustrate new approaches to human evolution and bear upon this larger discussion about women in evolution. First in addressing early hominid behavior, George Bartholomew, a young zoologist at UCLA, collaborated with Joseph Birdsell, a UCLA physical anthropologist who had participated in the Cold Spring Harbor symposium. Their innovative paper, “Ecology of the Prohominids” (1953), applied ecological concepts from vertebrate zoology to the study of human evolution in general and to the australopithecines in particular. Using comparisons with other mammals, they discussed the advantages of large body size, terrestrial locomotion and the freeing of hands for tool use. In addition, they discussed population spacing and territoriality, population equilibrium and reproductive potential.

Reasoning that the loss of estrus and sexual bonds based on continuing mutual attraction provided a biological foundation, Bartholomew and Birdsell speculated that the prohominids formed relatively stable family groups. In their view, the long-surviving family unit is a central element in human sociality, essential for providing parental care of dependent young, and the mother-offspring bond serves to shape social life. They also pointed out that males are more aggressive and tend to be dominant over females in most situations, especially where force is involved.

Following Raymond Dart’s lead (1949), the authors proposed that the australopithecines depended on tools for aggressive interactions and for killing and butchering animals. Australopithecines were believed to hunt in groups much like canids and killer-whales. Similarly to Robert Broom (1950), Bartholomew and Birdsell suggested that sexual dimorphism arose as a product of sexual selection associated with competition between males for

females; aggressive behavior associated with hunting and a sexual division of labor were secondarily derived functions of this dimorphism.

In a number of respects the Bartholomew and Birdsell article was forward looking; it pointed to the significance of ecology in studying human evolution and advocated the collection of new kinds of data, utilizing new techniques. On the other hand, the authors’ focus on the topics of aggression and hunting, male competition and sexual selection, remains as the central agenda in most human evolutionary reconstructions today. Unfortunately, reconstructions of this type fail to recognize alternatives to aggressive behavior as shaping the course of human evolution.

The second paper from the 1950s of importance to this discussion, “The Evolution of Human Behavior” (Washburn and Avis 1958), combined a nonhuman primate framework with information from recent fossil hominid discoveries and new dating techniques. As a way to assess the direction of change during human evolution, the authors compared monkeys, apes and “man,” in such features as reproduction and growth, social groups, special senses, and locomotion. The article is an interesting mix of innovative approaches, while remaining grounded in traditional assumptions about women’s and men’s roles. For example, Washburn and Avis discuss the human infant’s long period of dependency, and note that “devices to help the mother carry the baby” must have evolved early; they also link the slow growth and long dependence of human infants to hunting, tool use, and food sharing by adult males. The authors question whether the australopithecines were hunters as proclaimed by Dart (Washburn and Avis 1958; Washburn 1957) but conclude that the early hominids did supplement their diet with more animal food than apes do. The distinction remains unclear here, as the article ends with this sentence: “Hunting as an important activity . . . had three important effects on human behavior and human nature: psychological, social and territorial” (433).

Washburn and Avis, much like Bartholomew and Birdsell before them, perceive sexual receptivity as a determinant of social behavior; continuous female receptivity is viewed as essential to the monogamous family, and, according to the authors, a hallmark of being human. Both articles, among the first to use an evolutionary framework to explore specifics of human social life, do go beyond description to include process. In this regard, they foreshadow topics central to the view of women in evolution. For example, Bartholomew and Birdsell note that pre-stone age wooden implements were probably important but would not survive in the archaeological record, a point that Richard Lee (1968a) would later emphasize in his discussion of women’s digging sticks. Emphasizing tool-using origins, Washburn and Avis note that because tropical hunters subsist mainly on vegetable food, “the first tools were probably used to extend the quantity and variety of this (vegetable food) rather than to obtain meat” (1958: 433). Both these points become important for considering women’s roles in human evolution.

However, women are not mentioned directly in either ground-breaking article by Bartholomew and Birdsell or by Washburn and Avis. Women are referred to indirectly in two contexts: as mothers carrying their helpless infants and forming long-term ties with offspring, and as sexually receptive and mates for men. The themes that keep women in their place continue and persist in reconstructions of human evolution – that of the monogamous family based on female sexual receptivity, on the one hand, and male dominance and the primacy of male hunting on the other. One might argue that the evolutionary glass ceiling for women was being installed in the 1950s.

THE 1960S: CONSOLIDATION OF MAN THE HUNTER

By the mid-1960s, the study of human evolution was enjoying a windfall of new information due to the rich fossil discoveries of early hominids in Africa and field research on African apes, other nonhuman primates, and savanna mammals. But it was ethnographic information that both formalized the concept of “man the hunter” and provided a means to challenge it.

More than any other publication, the volume *Man the Hunter* (1968) consolidated the ideas initiated in the 1950s about hunting in human evolution. Not long after completing his doctoral field work in southern Africa on the subsistence of Kalahari hunter-gatherers, Richard Lee, together with Irvan DeVore, both Washburn students, were approached by Sol Tax, a social anthropologist at the University of Chicago. Tax asked Lee and DeVore to organize a symposium of current research on foraging peoples of the world (Lee and DeVore 1968a). The conference, “Man the Hunter,” held in April 1966 convened ethnographers, archaeologists and physical anthropologists. Topics ranged from ecology and economics to social organization and demography. The subsistence of living peoples was discussed along with early hominid dietary reconstruction based on archaeological investigation of the Paleolithic past. The conference focused on a vanishing way of life that reflected the human nomadic past prior to widespread settlement with permanent dwellings, accumulation of possessions, and management of food sources. Several conferees reported that meat in these nomadic societies is the most valued food – the most nutritious and most desirable food – possibly justifying emphasis on this food resource by the researchers.

Reading this volume again nearly thirty years later, I am struck by how rarely women are mentioned in it. The editors recognized women’s activities, but women are barely integrated into the ethnographic or evolutionary record. Paradoxically, this volume gave voice to themes leading to the development of two opposing views of human evolution – one highlighting women’s roles, the other elevating men and minimizing women. I illustrate this tension with three quotes from the introduction (Lee and DeVore 1968b).

First, a justification for the emphasis on hunting.

It was also generally agreed to use the term “hunters” as a convenient short-hand, despite the fact that the majority of peoples considered subsisted primarily on sources *other than meat* – mainly wild plants and fish.

(Lee and DeVore’s emphasis, p. 4)

Second, one of the few specific references to women appears in the context of food.

It is also likely that early woman would not have remained idle during the Pleistocene and that plant foods which are so important in the diet of inland hunter-gatherers today would have played a similar role in the diet of early peoples.

(p. 7)

Finally, a justification for the primary emphasis on male roles.

Hunting is so universal and so consistently a male activity that it must have been a basic part of the early cultural adaptation even if it provided only a modest proportion of the food supplies.

(p. 7)

In the volume, papers by Washburn and Lancaster (1968) and Laughlin (1968) focus on hunting and male activities. However, in the same volume, Lee (1968a) provides a contrasting view by recognizing women’s roles in the context of human evolution.

Washburn and Lancaster build upon Washburn’s previous ideas on the evolution of hunting (Washburn and Avis 1958; Washburn 1960). On the one hand – and this point is often missed – Washburn widened the framework of human evolution by integrating new information on hunting-gathering people with information from ecology, nonhuman primates and the fossil record. But he also reinforced the idea of monogamy, of male food-sharing with females, and a well-defined sexual division of labor. His emphasis on a home base and food-sharing, first discussed in 1958, is further developed here. In this scheme, the single most important factor that shaped human nature was meat procurement, gained by male efforts and shared with their mates. The closing sentence epitomizes the theme: “for those who would understand the origin and nature of human behavior there is no choice but to try to understand ‘Man the Hunter’” (Washburn and Lancaster 1968: 303).

In contrast, Lee highlights women’s work. His findings were singled out for mention when the volume was reviewed in *Science*: “hunting by males is usually of less significance to subsistence than the foraging after wild plants by females” and “life there is *not* nasty, brutish or short” (Service 1969: 1045). Although Lee only touched upon women’s activities, that touch contributed substantially to formulating a place for women in evolution. He brought to the reader’s attention an image of women as active, not sitting idly and

passively around the Paleolithic hearth. His clear exposition of women's roles in subsistence set a tone, though it stood alone in this volume, when he wrote: "men's and women's work input is roughly equivalent" and "the women provide two to three times as much food by weight as the men" (Lee 1968a: 33). Later he discussed, without mentioning women specifically, the necessity for long-distance travel, and implied that women were mobile, active and involved in subsistence. Lee enumerated women's activities and contributions, rather than pigeon-holing them into monogamous relationships within narrowly defined categories of a sexual division of labor.

Despite Lee's innovative work within mainstream anthropology the catchy phrase "Man the Hunter" had become a rallying-point for the reconstruction of early human behavior. It came to stand for a way of life that placed males center-stage, gave an evolutionary basis for aggressive male behavior and justified gun use, political aggression, and a circumscribed relationship between women and men as a "natural" outcome of human evolutionary history. "Man the Hunter" purported to explain the selective force behind the development of "human" anatomical and behavioral features. It implied that monogamy and a sexual division of labor are ancient and defining human traits. Unfortunately, even though the details of hominid reconstructions have been modified in the subsequent decades, the principle of male centrality and female invisibility has been retained now, as it was then.

THE 1970s: WOMEN SCIENTISTS AND "WOMAN THE GATHERER"

The social climate of the 1970s encouraged questions about women's roles in evolution, about human nature, about whether there is a definable female or male nature, and about the validity of hunting as a defining human activity.

In particular, ethnographic studies on women and children helped remediate stereotypes of females as helpless mothers bonded to and dependent upon males. Patricia Draper's research (1975, 1976), for example, provided further details on the lives of !Kung women under foraging conditions and under new conditions of permanent settlements.

Draper illustrates that, in spite of its low level of technology, a foraging life is complex and women are knowledgeable and autonomous. Gathering, for instance, is not just a matter of picking up and collecting nuts or melons. !Kung women must know where to find food items and in what season they are edible; often women must walk 16 km or more a day, carry a full day's harvest and usually a child, and keep oriented in the bush (Draper 1976). The women pay close attention to tracks of dangerous animals, learn how to deal with each species, and when they return home in the evening, tell the men about potential hunting opportunities. From her firsthand experience, Draper could appreciate the years it takes to integrate the wide range of skills

necessary to survive in a foraging and collecting way of life, and how such skills contribute to women's autonomy.

However, the everyday lives of women and children dramatically change with village and sedentary life (Draper 1975). Due to the changing ecological and political situation in southern Africa during the 1960s, some groups of the !Kung gave up a nomadic foraging way of life for one based on the raising of livestock and living in villages with permanent dwellings. What is particularly valuable about this "natural experiment" is that the people living in these two settings came from a population with the same cultural history, geographical location and genetic background. Women, once mobile and autonomous, now spend their time doing household chores, looking after the accumulation of material things, caring for the permanent dwellings and children.

Whereas previously children had no subsistence responsibilities until the teen years, in the sedentary villages young girls become socialized early to help with domestic tasks. Young boys go out to look after the goats and roam widely. Furthermore, the birth interval decreases from the traditional 5 to 3 years (Lee 1972; Howell 1979). Older female children, not caretakers when living as foragers, as villagers become caretakers of younger siblings. By age 5, girls and boys are well socialized into their gender roles and have separate lives. This is in strong contrast to the mixed age and sex play groups observed when the life style is foraging in the bush (Draper 1976). Thus, the relatively egalitarian nature of women's and men's roles and social relationships in a foraging way of life can be overturned in one newly socialized generation. Therefore custom, not nature, makes women sedentary and dependent.

Picking up on and emphasizing the active dimensions of women's lives as did Lee (1968a and b), Sally (Linton) Slocum offered a counter to the mainline hunting thesis: "Woman the Gatherer: Male Bias in Anthropology" (1975). This article, perhaps more than any other, served to catalyze the possibilities of alternatives. Slocum questioned male hunting activities as the primary mode of subsistence and countered with an emphasis on women's gathering activity. She challenged male centrality in social life with findings from primate social behavior studies that revealed female primates with offspring have pivotal roles in social life. In these studies, females, not males, transmit social rank to the offspring. Slocum's paper laid the groundwork for more detailed examination of women's roles in past and present societies.

In the context of this new challenge, Nancy Tanner and I wrote about human origins, utilizing a range of newly emerging information, with the purpose of providing a specific picture of early human social life that incorporated women and children (e.g. Zihlman and Tanner 1974; Tanner and Zihlman 1976; Zihlman and Tanner 1978; Zihlman 1978). We assessed female social life, anatomy, and ecology by incorporating information from living

foraging people, fossil hominid record, and findings on wild populations of monkeys and apes. Previously, in order to clarify changes during human evolution, Washburn and DeVore (1961) compared and contrasted savanna baboons with pre-agricultural humans. In addition, in order to speculate about the origin of human scavenging and hunting, Schaller and Lowther (1969) studied lions and hyenas and experimented with scavenging themselves. We contended that chimpanzees served as a better model for a prehomimid ancestor than did baboons or carnivores.

Three crucial lines of new data made a compelling case for looking to chimpanzees for potential similarities with prehomimid ancestral populations: (1) molecular biology which demonstrates a close genetic relationship between humans, chimpanzees and gorillas; (2) the discovery of fossils which reveals anatomical similarities between chimpanzees and the earliest hominids, and (3) observed behavior from free-ranging chimpanzee studies.¹ Incorporating this range of new information, Tanner and I discussed hominid origins and women's roles utilizing chimpanzee behavior as a working ancestral baseline.

It was in this context of writing about hominid origins and women's roles that Tanner and I questioned hunting. This point is often overlooked, and I underscore it here. For example, Conkey and Williams (1991) have the misconception that our ideas were developed in the context of feminist theory. However, in the early 1970s there was no such theory. Rather, Tanner and I drew on the broad spectrum of data emerging from multiple areas of research that did not support the hunting hypothesis. Incorporating this information, we proposed reasons why women during human evolution must have been active participants in subsistence and several dimensions of social life, in addition to their centrality in reproduction. We contended that, in the earliest stages of human evolution, gathering plant foods entailed technological innovations for collecting, carrying and sharing food; that the large grinding teeth of fossil hominids suggested a diet of plant foods; that hunting emerged in human evolution relatively late, half a million years ago – as compared to human origins at over 3 million years – and emerged from the technological and social foundations established by the gathering of plant foods.

Our views of a sexual division of labor and monogamy departed considerably from those associated with the hunting paradigm. We argued against a rigid sexual division of labor in this earliest stage of human evolution. Alternatively, we argued for flexibility of roles and maintained that it was more likely that all individuals – regardless of sex – performed a wide range of tasks, a contention supported by additional research on foragers (e.g. Peacock 1991; Estioko-Griffin 1985). As noted by Lee and Draper, among foragers men as well as women gather plant foods, and women hunt (Estioko-Griffin and Griffin 1981). Within this flexible system, which is also observed

among chimpanzees, activities are likely to vary by age and the reproductive stage of females rather than be somehow intrinsic to being female or male.

Regarding sexuality and reproduction, we questioned monogamy as a human hallmark and alternatively, utilizing newly emerging discussions about sexual selection, conjectured that females chose their mates, facilitated by subtle communication rather than overt morphological signals like sexual swellings. We went on to speculate that females chose friendly males who would share food – in contrast to provisioning or doling out food – a speculation that has some support in recent field studies of chimpanzees. We maintained that the widespread assumption of a pair bond in this early stage of human evolution was a projection back in time to a narrow Western view of marriage and mating, a formulation too rigid to account for the variation that exists cross-culturally.

A further challenge to the hunting hypothesis took the analysis to yet another level beyond the scientific data. In a little-known but innovative article, Perper and Schrire (1977) point out parallels between the interpretation of hunting as propelling humankind into humanity, on the one hand, and the biblical myth of expulsion from Eden, after Eve's eating of the tree of knowledge, on the other. The authors argue that both fates – that of hunting and of the expulsion – were precipitated by an act of eating – meat in the first instance and forbidden fruit in the second. As for the sexual division of labor, the authors note the parallel of male hunting with the biblical story of Eve, who was, as the story goes, created as a helpmeet for Adam. The authors go on to examine closely the archaeological evidence, pointing out that differential decay of materials over time leads to overrepresentation of large animal bones in the archaeological record and loss of organic material. The documentation of the ability of free-ranging baboons to catch and eat meat lies well within the behavioral repertoire of nonhuman primates and is not specific to humans.

As the 1970s drew to a close, questions arose about the evidence to support the early emergence of hunting, and the concept of gathering and hunting became widely recognized. Glynn Isaac (1978), for example, emphasized food-sharing and incorporated gathering with hunting – the idea of the mixed economy – in his model for human evolution. Initially, or so it seemed, reconstructions of human evolution promised to be broadly based, taking into account women's roles along with those of men. In 1978 Glynn Isaac and Richard Leakey organized a symposium "Men and Women in Prehistory." Several participants discussed aspects of gathering and women's activities along with hunting, scavenging and the fossil record. However, the promise of these initial improvements was short-lived. For example, although Owen Lovejoy and Donald Johanson were participants, their subsequent writings ignore altogether the ideas that Jane Lancaster, Glynn Isaac and I presented at the conference about women in evolution (e.g., Lovejoy 1981; Johanson and Edey 1981).

THE 1980s: TRENDS AND COUNTER-TRENDS

Tensions surrounding the role of women in evolution – detectable in the 1960s and becoming overt in the 1970s – turn into well-established and divergent research paradigms in the 1980s. With momentum gained during the 1970s, research and writing on female primates and women flourished in the 1980s and into the 1990s. The role of hunting in human evolution continued to be questioned by some archaeologists. At the same time, however, women's role in gathering was diminished by a new emphasis on scavenging, by attempts to resurrect hunting and by the co-option of gathering into the male behavioral repertoire. In addition, cultural critiques of theories of human evolution and women's roles in evolution appeared during the 1980s.²

Long-term studies on free-ranging populations of macaques, baboons and chimpanzees, as illustrated in Linda Fedigan's *Primate Paradigms, Sex Roles and Social Bonds* (1982), challenged the stereotype of female monkeys and apes and addressed major issues regarding female and male behavior. Fedigan questions the sex-stereotypes of male aggression, dominance and alliance, and female passivity. Primate females, as Fedigan observes, demonstrate the ability to take care of themselves and their offspring with little, or even no, help from primate males. Fedigan also notes the power of language in describing differences between the sexes. For example, research terminology encourages the perception of females as passive or inferior to males.

Addressing female energetics and reproduction, Jeanne Altmann (1980) documents the extensive physical investment and behavioral alterations of females in producing and caring for their offspring. Building upon Thelma Rowell's earlier work on the structure of baboon troops and concepts of social dominance (1966, 1974), Barbara Smuts (1985) and Shirley Strum (1987) offer alternatives to the stereotypes of the aggressive, dominating male baboons who control social life. Smuts's discussion of female-male friendships reflects a texturized picture of relationships between the sexes, and Strum emphasizes that it is males' social skills, rather than fighting ability, that secure their position in a new social group. Documenting life histories of female chimpanzees, Goodall (1986) confirms the breadth of female participation in daily social life and species survival.

Ethnographic research continued to provide new perspectives on women's lives. In a now classic work, *Nisa: the Life and Words of a !Kung Woman*, Marjorie Shostak (1981) dramatized women's lives through an "upclose and personal" portrait of a remarkable woman. Nisa emerges as competent, observant, witty and independent. She narrates a rich emotional and social life – growing up, getting married, having children – and surprise! taking lovers. Women in Nisa's society are free to divorce and choose new mates. These revelations alone would be sufficient to negate stereotypic or simplistic

notions about monogamy and relationships between women and men in this society or in prehistoric ones.

New directions in ethnographic research not only documented the relationship between subsistence, nutrition and work, but also the relationship between work effort and conception, pregnancy and lactation (e.g., Peacock 1985; Bentley 1985; Panter-Brick 1989). Women, even those with children, hunt quite effectively in some cultures, further challenging what has been touted as a strictly male domain (Estioko-Griffin and Griffin 1981; Estioko-Griffin 1985). These studies, and several others, convey the multi-dimensional reality of women's lives and illustrate the necessity for featuring females in discussions of human evolution (e.g., Tanner 1981; Dahlberg 1981; Zihlman 1981).

During this time archaeological studies produced evidence that served to question the sufficiency of the evidence for an early appearance of hunting in hominid evolution. Through the study of bone accumulations in South African hominid cave sites alleged by Dart (1949) to be the remains of australopithecine hunting, Brain (1981) effectively refuted these claims by demonstrating the bones in question were the remains of carnivore meals. In these same early hominid fossil deposits Brain (1985) later uncovered bone implements with striations which he duplicated experimentally from digging in dry sandy soil. Such implements and their presumed use could support the hypothesis that early hominid subsistence included plant gathering, though this connection was not made directly.

Approaching hunting from another angle, Binford (1981) and Potts (1984) studied the association of animal bones and stone tools in East African hominid sites. They questioned whether these associations sufficiently demonstrated hominid hunting and home bases and alternatively concluded that carnivores, as well as hominids, were agents in accumulating the bones and that these areas were not likely to be hominid home bases. In a review of archaeological sites, Klein (1987) emphasized that, especially in open-air sites near water, human artifacts and animal bones found together may not be functionally related; he concluded that effective human hunting probably did not emerge prior to the later part of the Middle Pleistocene some 200,000 years ago.

Parallel to these studies questioning interpretations about human hunting and home bases, research on the scavenging and butchering of large animals renewed an emphasis on the importance of meat-eating during human evolution (e.g., Bunn 1981; Blumenschine 1986; Shipman 1986). Evidence for such theories emerged, for example, from observations of cut marks and percussion marks on fossil animal bones, characteristics that can be duplicated by stone tools and so presumably made by them. Scavenging as the means to obtain meat is now a major research paradigm for a number of archaeologists. It replaces hunting while dismissing gathering, as illustrated in the following quote:

The direct evidence of early hominid diet allows us to dismiss models of human evolution which do not incorporate meat-eating as a significant component of early hominid behavior.

(Bunn 1981: 577)

A variety of questions might be raised about these interpretations of scavenging and presumed significant meat-eating, for example: the possibility that trampling of bone by large animals may mimic cut marks by stone tools (Beyrensmeyer *et al.* 1986); the overinterpretation of the sample size which derives from a small number of hominid sites and of bones showing cut marks; the differential preservation of large animal bones, pointed out by Perper and Schrire (1977) and Lee (1968b), or the fact that the earliest evidence for cut marks and presumed butchering and scavenging are 2 million years later than is evidence for the earliest hominids themselves, which is the period in which gathering is proposed.

Even granting that the evidence for hominid butchering is unequivocal, and its interpretation that scavenging and meat-eating were of central importance in human evolution, the point here is that this renewed emphasis on butchering and scavenging not only refocuses on meat-eating in human evolution, but draws attention away from the possibility of women's participation in subsistence activities. Eliminating discussion of gendered activities is another, though subtle, way to promote male centrality and to render women invisible in evolutionary reconstructions.

A much-cited article, "The Origin of Man," published in *Science* by Lovejoy (1981) offers another twist to the portrayal of women's roles in evolution in the 1980s; namely, males, not females, gathered plant food. Presented as a new explanation for the origin of hominid bipedal locomotion, Lovejoy reverts to the earlier view of social evolution – sexual division of labor and a pair bond while rejecting the notion that males hunted. His theme develops in the following way. The success of the human species depended upon an increase in hominid population size; this was achieved by a decrease in the interval between births to two years. In order to do this females reduced their mobility, stayed near a home base, and became dependent upon males who provisioned their own mates and offspring. The pair bond, Lovejoy argues, ensured a male's paternity and the male does not invest in offspring not his own.

This view of women in evolution insists on male dominance and male provisioning of immobile, continually breeding, dependent females. Lovejoy's argument stands in contradiction to studies (1) demonstrating that female monkeys and apes and foraging women are mobile throughout all reproductive stages and (2) that the birth interval for foraging women, as for the great apes, lies between 3 and 5 or more years (e.g. Fedigan 1982; Altmann 1980; Draper 1975, 1976; Howell 1979; Shostak 1981). Lovejoy's argument not only ignores the evidence counter to his position but it also suspends the

biological and ecological associations for early hominids and sets them up as a special case departing from other primates. This view of human evolution is a reincarnation of the themes from the 1960s of a rigid sexual division of labor and of a pair bond. (See Falk this volume and Zihlman 1995 for further discussion.)

My last example to illustrate the undermining of women in evolution during the 1980s comes from an article in which the authors claim to analyze objectively models of human evolution. Tooby and Devore (1987), adding to Hill (1982) attempt to make a case for the primacy of male hunting, pair bonds and sexual division of labor. In order to resurrect "man the hunter," Tooby and DeVore must first dispel the gathering hypothesis. In order to do so, the authors ignore almost all of the data supporting the hypothesis and dismiss any role for gathering on the grounds that it is merely a feminist counter to hunting (1987: 212). They contend that chimpanzees, rather than baboons, are used to model the prehuman ancestor in the gathering hypothesis because "male dominance is less popular as a research perspective than the putatively more peaceful chimpanzees" (1987: 187); and gathering is "defective because it concentrates only on women" (1987: 192). They do not acknowledge any of the genetic, paleontological, anatomical, behavioral and archaeological evidence supporting an alternative to the hunting hypothesis. Instead they maintain that the "hunting hypothesis has fallen from favor because of feminist revisionism" (1987: 222). Tooby and Devore do give a convincing argument against scavenging, and although praising Lovejoy (1981) for his conclusions about monogamy and male parental investment, a sexual division of labor, and male-male competition, they maintain that hunting behavior best explains these human hallmarks (1987: 226).

These articles and a number of others illustrate the divergent approaches to the place of women in evolution. During the 1980s, the trend to minimize food-gathering by women in evolutionary reconstructions grew. The emphasis on scavenging and invisible females, provisioning of gathered food by males and the resurrection of hunting all contributed to shifting reconstructions of early hominid life away from gathering, crowding out any role for women by presenting no alternatives. Ironically, during this same period information continued to come forth to document the many social and reproductive dimensions of female lives.

THE 1990S: THE GLASS CEILING

The increasing focus on women and female primates has begun to correct the neglect of women in evolution and has helped in the development of a more complete evolutionary record. Although women may now officially be part of human evolution, a mixed message prevails. I have presented a sample of some key articles from the academic/scientific literature to illustrate the significant trends in women's inclusion, or exclusion, in evolution. In this last

section, drawing on examples from textbooks, a recent television special and a new museum exhibit, I examine how academic research is translated and presented to a wider audience which includes both the general public and students of evolution. These portrayals, whether consciously or not, undermine the improving status of women as equal players in evolution and at the same time demean the contributions of women as scientists.

Textbooks for introductory biological anthropology courses treat women's roles in a variety of ways, mostly by omitting them altogether. If gathering is mentioned at all, it tends to be dismissed as "a female-centered view" or a feminist reaction to the hunting hypothesis, and hunting, inadvertently or not, is therefore emphasized. Lovejoy is cited frequently as providing the most useful model for hominid evolution. For example, "In spite of its problems, Lovejoy's model remains useful in its effort to link bipedalism with increased fertility and/or survival" (Relethford 1994: 349). In Nelson and Jurmain, Lovejoy provides "a recent comprehensive reconstruction" (1991: 263). In the same 1991 volume, "gathering" is not indexed though "hunting" receives eleven entries. In an effort to update their text, Nelson and Jurmain (1994, sixth edition) discuss "Man, the Hunter; Woman, the Gatherer?" in a specific inset. The "man the hunter" theory is summarized in some detail and acknowledged as male-centered. Although pointing out that the hunting hypothesis does not hold up to analysis, the gathering hypothesis is confusingly presented along with Elaine Morgan's (1972) unscientific aquatic theory of human evolution. The authors leave the impression that all reconstructions of human evolution are culturally bound and therefore are all equally valid/invalid.

A public television series on human evolution aired in early 1994, and the simultaneous publication of its companion text (Johanson *et al.* 1994) offers a 1990s version of the 1960s view of human evolution. In the 1960s the idea that women were participants in human evolution did not exist at the conscious level. In contrast, in the 1990s the existence of women in evolution is less easily ignored, and therefore their contributions must be denied. I briefly illustrate this point with three examples from *Ancestors* (Johanson *et al.* 1994).

Johanson resurrects Owen Lovejoy's 1981 hypothesis about social life and presents it as "a social model for bipedalism's beginnings:"

In Owen's model, both sexes choose a mate because each has something to offer: the female offers the male a guarantee that his genes pass into the next generation, and the male offers the female a reliable source of food and shared parenting duties. . . . The male could save perhaps half of his mate's time that would otherwise be spent searching for food and could now be devoted toward raising young.

(p. 79)

This translation of Lovejoy – males exchange food with females in return for guaranteed paternity – now has a 1990s spin: efficiency of time use, economics

of trade, and the sociobiological emphasis on reproductive success. Consequently, early hominid females are the means for hominid males to achieve their economic and reproductive objectives!

Next, the possibility that early hominids hunted is dismissed. Not surprisingly, for Johanson, scavenging and butchering now hold the answers for explaining early hominid behavior. Rob Blumenshine is featured as "one of the new generation of archaeologists" who is exploring scavenging by studying African carnivore behavior (Johanson *et al.* 1994: 102). This exegesis overinterprets the evidence of cut marks on bones. Scavenging and butchering is presumed to be men's work, and the issue of food gathering is ignored, thereby side-stepping any role for women in evolution.

In a third example, Johanson reviews new research by C.K. Brain at Swartkrans on the possible use of bone tools in obtaining plant foods. (Previously I mentioned Brain's work on bone concentrations in the caves that led to overturning Dart's ideas that the hominids were killer-apes.) In the chapter on "The nutcracker people: *Australopithecus robustus*" Johanson *et al.* (1994) report on Brain's experimental study that duplicates abrasions on some fossil bone fragments. These bone fragments have worn and rounded tips and, when placed under a microscope, show abrasions. Carrying out experiments on other bone fragments, Brain duplicates these abrasions when digging up edible bulbs and tubers common in areas nearby. Brain presents this indirect evidence for hominids utilizing plant foods. However, Johanson dismisses the possible importance of plant foods early in human evolution. He concludes "that robusts may have been using digging sticks and *Homo* may have been using both digging sticks and stone tools" (1994: 166). Therefore, the genus *Homo*, the real human ancestor, is tied to the exploitation of meat and to using stone artifacts. Even if *A. robustus* did gather plant foods – though there is no allusion to this point or to gendered activities – this behavior was important to the species that was a dead end in human evolution!

These examples – scavenging, male provisioning and plant foods as tied to an evolutionary dead end in human evolution – serve as illustrations that discussion of gender, or women's activities, is best avoided, and with that avoidance the idea that women had an active participatory role in human evolution.

My last illustration from the 1990s returns to the new permanent exhibit "Human Biology and Evolution" at the American Museum of Natural History and the companion book *The Human Odyssey* (Tattersall 1993). The exhibit consists of holograms, films, interactive videos, murals and dioramas. Although textual labels do accompany each exhibit, it is the visual images – particularly in the diorama scenes of ancient human life – that carry the impact.

In the exhibit, impressive dioramas depict scenes from the "human fossil record" of *Australopithecus afarensis*, *Homo erectus*, Neandertal and *Homo*

sapiens. A large mural displays the life of early hominids. Interestingly, in the text (Tattersall 1993: 91) the male walking in the foreground holds a set of antelope horns, but in the museum's mural, a plant replaces the horns. The old themes, with their typical emphasis on the male hunting and fighting within and between hominid groups, give way to an overall impression of a kinder, gentler hominid history.

This ambiance contrasts with earlier popular books on human evolution. For example, in 1965 the Time/Life *Early Man* by F.C. Howell combined text with visual representations of scenes such as those of australopithecines fighting with hyenas, and a battle between *Australopithecus* and *Homo* at Olduvai. Illustrated chapter titles in the 1965 book read as "The origins of meat-eating" and "A hunter's life." *Homo erectus* is heralded as "A true man at last" and *Homo sapiens*, "A new kind of man." The vegetarian *Paranthropus* individuals depicted by Jay Matternes (in Howell, F.C. 1965) as peaceful collectors of fruits and vegetables became an "evolutionary dead end," presumably becoming extinct because they did not hunt and eat meat – the stance that Johanson *et al.* (1994) adopt in *Ancestors*. In this and other older texts, although hominid women were accorded a condescending nod, there was little room for portraying their part in evolution.

In the new American Museum exhibit, the murals and dioramas carry mixed messages. For example, Jay Matternes's skills return in the mural entitled "Early Human Life Styles." In contrast to his 1965 images, the new exhibit painting emphasizes a peaceful and social atmosphere. It shows a group of adults collecting food on the savanna, youngsters playing, and a female with an infant. The legend below declares, "All higher primates are very sociable and most groups are cemented by the mother-offspring bond. . . . This bond would have stabilized early human groups and also formed the basis for larger kinship networks." But this vital point is lost in the other dioramas – that is, the point that human ancestors, like people today and other primates, live not as isolated adult pairs, but in social groups of all ages and both sexes. Instead, the dioramas give the distinct impression that the social group consists of a pair-bonded female and male – the nuclear family – despite the demurrer under the *Homo erectus* diorama that states, "Placing an adult male and female in this scene is not intended to suggest a nuclear family."

In contemplating these scenes I thought of Diane Gifford-Gonzalez's (1993) study of prehistoric dioramas. Gifford-Gonzalez, along with other scholars, has begun to systematically examine, document and analyze how women are depicted in visual representations in prehistory. An entire symposium at the annual meeting of the American Anthropological Association (1992), "Envisioning the Past: Visual Forms and the Structuring of Interpretations," explored the relationship between power and culture as affected by objects and language in the social constructions of these relationships. In analyzing prehistoric *Homo sapiens* depictions in books, Gifford-Gonzalez (1993) noted that in 88 scenes consisting of 444 individuals, adult

males appear in 84 per cent of the scenes and comprise 50 per cent of the individuals. Males are more often portrayed in the foreground, standing, running, walking, hunting, carrying game or firewood, or engaging in ritual activities. Adult females appear in less than 50 per cent of the dioramas and are fewer than 25 per cent of the individuals; they are usually in the background, rarely standing or being physically active, and often are crouching on all fours scraping hides.

The American Museum exhibit provides examples that support Gifford-Gonzalez's findings. For example, the *Homo sapiens* diorama of mammoth-hunters living 15,000 years ago in Mezhirich, Ukraine, depicts three figures. The woman crouches on one knee in the foreground, as she leans to extract frozen meat from the permafrost refrigerator. In contrast, the man stands behind and towers over her, carrying a large horizontal bundle of firewood across his shoulders. The third figure, perhaps a youngster of indeterminate sex, emerges from the bone hut on all fours.

In another diorama, consisting of three Neandertal adults, only the man is standing while using a small tool to sharpen a long stick or spear. A younger woman is seated using her teeth to anchor a hide as she holds and scrapes it – a slightly modified version of what Gifford-Gonzalez (1993, 1995) calls the faceless "drudge-on-the-hide." The older woman is sitting and gesturing at the young woman. One reviewer of the exhibit from the *Washington Post* interpreted this as the mother-in-law giving advice (April 16, 1993). These two dioramas match Gifford-Gonzalez's survey of prehistoric images; the male figure stands tall and dominant while the females sit or kneel in a subservient manner.

The *Australopithecus afarensis* diorama depicts two lone and naked figures presumed to be our earliest ancestors from Laetoli, Tanzania, leaving their footprints in volcanic ash as they walk across the bleak African savanna. This scene troubled me for three quite different reasons. First, this particular representation is supposedly based on scientific evidence, when, in fact, the evidence is anything but conclusive. The male is constructed as considerably taller than the female, denoting that within this single species there is presumably considerable difference in size between the sexes. Within the scientific community, however, there is strong disagreement regarding whether or not the large and small fragmentary fossil specimens found in East Africa really represent female and male members of one species. The collection of fossil bones and teeth may include at least two different kinds of hominids, both of which might be female, or both of which might be male (Falk 1990; Hager 1991; Zihlman 1985).

However, this exhibit supports the "single species hypothesis" as demonstrated by the representation of a tall male, towering over the smaller female. The label below the display attempts to convey scientific accuracy, noting that "These figures are based on fossils attributed to *Australopithecus afarensis*, but although their body proportions are thus presumably accurate,

many details of these reconstructions are entirely conjectural." No comment is made on the major assumption that the fossils represent one species. To further convince the viewer of their scientific accuracy, the label continues, "Among the attributes that can only be guessed at are hair density and distribution, skin color, form of the nose and lips and many other features" (Tattersall 1993: 76). The display as a whole misrepresents the scientific climate and therefore misleads non-anthropologists who view the exhibit.

There is a second troublesome issue. In the positioning of the two figures relative to each other, the taller male has his hand and arm firmly enfolding the female's shoulder, a strong nonverbal message. Touch can communicate affection and reassurance, but nonreciprocal touching also expresses power relationships, in which the toucher is perceived as dominant or with higher status than the recipient of the touch (Major 1981). The idea conveyed to the audience is that the more powerful male protects and reassures the frightened and presumed weaker female.

A third issue is the profoundly unsettling way in which the two figures are freeze-framed. Of all of the dioramas and murals in the new exhibit, this one alone gives no indication of the species' way of life; there is no evidence of food, tools, or group social life. The australopithecines are depicted as though they do not belong on the savanna at all, despite the fossil remains preserved at Laetoli along with the footprints indicating that the hominids lived here and were not just passing through. This diorama mirrors Adam and Eve's ejection from the Garden of Eden and illustrates visually how religious beliefs from the Old Testament about relations between Man, Woman and God (or Nature) – a scene depicted repeatedly by the greatest western artists for the past millennium – is now a part of the most up-to-date scientific presentation of human history and evolution.

Because we as a species rely so much on the visual sense, information conveyed visually and nonverbally carries considerable emotional force in interpersonal communication (Henley 1977). Age, sex, body posture, facial expressions, the relationship of figures to each other – all convey universal messages that people grasp instantly and intuitively, though often unconsciously (Mayo and Henley 1981). In conveying to the public an image of the traditional western relationship between the sexes, with men in the dominant positions, women in the submissive positions, the diorama holds a power more effective than words.

SUMMING UP

In conclusion, speculation about early human social life began taking shape in the 1950s. The "Man-the-Hunter" theory prevailed during the 1960s when women's roles in evolution were either off-stage altogether or merely on-stage in supporting roles to men. With the renewed awareness of the 1970s, the question arose, "where are the women?" Through the efforts of scientists,

many of whom also happened to be women, females started to take their place on the evolutionary stage. But in spite of a more inclusive perspective – both in terms of women scientists' ideas and women's roles in prehistory presented during the 1970s – these ideas were degraded during the 1980s with the re-emergence of views that omitted women. Here we are now in the 1990s; women and men are in the midst of a backlash against the hard-won gains of women in so many spheres of contemporary life (Faludi 1991), and evolution is no exception. The "Second Sex" continues to be portrayed as the handmaidens of society's male players who, if we are to accept current theories, were out there innovating and making hominid evolution happen. What is particularly ironic is that this back eddy runs counter to the increasingly powerful current of research demonstrating the centrality of women and female primates in social life and the evolutionary process. But the concept of women in evolution remains encased in the glassed-in Old Testament diorama held down by a Paleolithic glass ceiling.

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NOTES

- 1 Beginning in the 1960s with Kortlandt (1962) and Reynolds (1966), several field primatologists emphasized behavioral continuity between chimpanzees and humans and the insights that chimpanzee behavior provides into human evolution (e.g. Teleki 1974; Goodall and Hamburg 1975).
- 2 During the 1980s, the gathering-hunting debate served as an exemplar for analyzing discourse around gender that was taking place in the wider cultural context, and for raising questions about the place of women scientists, the masculine nature of scientific activity and scientific objectivity (e.g. Keller 1985; Harding 1986; Haraway 1989; Schiebinger 1989). Within anthropology the growing voice of women primatologists and anthropologists (e.g. Hrdy 1981; Small 1984; Fedigan and Fedigan 1989; Lancaster 1989) called attention to gender as an issue in interpreting the human prehistoric past (e.g. Conkey and Spector 1984; Fedigan 1986; Spector and Whelan 1989; Zihlman 1987).

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