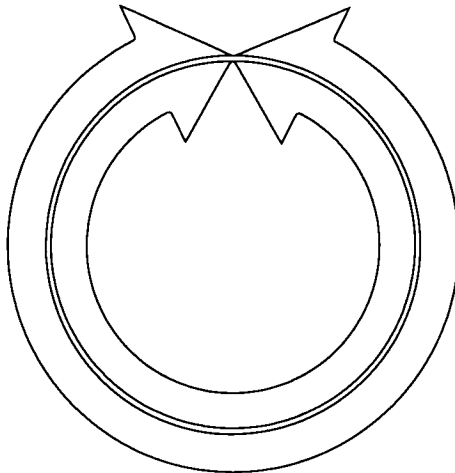


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THE RE-EVALUATION
OF EXISTING VALUES
AND THE SEARCH FOR
ABSOLUTE VALUES



ICUS

WAS DARWIN CONSCIOUS
OF HIS MOTHER?

by

DIANE MCGUINNESS

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*The Re-evaluation of Existing Values
and the Search for Absolute Values*

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Proceedings of the Seventh International Conference on the Unity of the Sciences
Boston, 1978

WAS DARWIN CONSCIOUS OF HIS MOTHER?

DIANE McGUINNESS

*University of California
Santa Cruz, USA*

Darwin and His Descendants

In the *Descent of Man* Darwin sets out the major distinctions between ape and man.¹ For the majority of these distinctions, bipedalism, development of tools, increased intelligence, and social behavior, etc., Darwin attributes the selection process solely to hunting and warfare, going so far as to conclude that benevolence and empathy are a direct result of male cooperation during war.

Continued speculation about factors leading to human evolution has not changed since Darwin. Washburn derives his theory on sharing from the hunt.² Shepher, writing this year in *The Journal of Social and Biological Structures*, concludes after reviewing many theories that the evolution of pair-bonding derived from the transition to hunting.³ This in turn led to larger brains because of tool-making, causing larger skulls, earlier parturition, wider hips and long lactation, sexual specialization, and less muscular, more cuddly females!

Apart from one or two authors, such as Lancaster and Morgan,⁴ evolutionary theorists seem convinced that male specific behavior provides the only relevant clues to man's evolutionary descent. Because of this onesidedness the theories are remarkably contrived and unconvincing. To remedy this state of affairs I wish to explore the possibility of developing a model based largely on female-specific behaviors.

The truth is no doubt somewhere in between, but as will be seen, natural selection based upon female aptitudes gets us considerably further from the apes than selection based exclusively on male aptitudes. This approach also has merit from a genetic point of view. Females have two X chromosomes. Genetic information from *either* chromosome can be passed

on to offspring of both sexes. Information from the male Y chromosome, however, can only go to one sex. No information from Y chromosomes is ever passed on to females. Thus, females maintain the dominant gene pool, sharing their *female* characteristics with both sons and daughters. As will be seen, this genetic arrangement is a direct parallel of behavioral distinctions.

The Puzzle of the Enlarging Brain

The major dilemma in the attempt to understand man's origins is related to *why* and *how* the brain began to change in size so dramatically. Man's nearest genetic relative, the chimpanzee, has a body weight of 45 kilograms and a brain size of approximately 400cm³. This is a ratio of 1kg to 8.75 cm³. *Homo sapiens*' body weight/brain size ratio is 1 kg to 22 cm³ (57 kg to 1230 cm³). The most important clues to the nature of this transition lie not only in the difference in mass of tissue, but in specific areas of development. The most prominent distinction is found in the four-fold increase in the size of the cerebral mantle. Both posterior and frontal cortical areas are grossly enlarged, and in humans the left hemisphere is larger than the right. This difference between the hemispheres is not found in the apes.

Bipedalism and use of tools, long considered to be fundamental antecedents of the changing brain, have largely been ruled out as salient contributors to man's evolution. Bipedalism and tool use occurred long before the radical change in brain size. Observations from Darwin's period to current studies by Goodall show that apes frequently use tools for a number of purposes.⁵ The discovery of a "home-base" for primitive man prompted a theory which suggested that we evolved *because* of discovering how to stay in one place and share food instead of foraging. However, the establishment of home bases has been shown to precede the change in the size of the brain. Bones, stone artifacts and crude tools have been found in small contained sites estimated as well over two and one-half million years old.

Nor is hunting the answer. Apes occasionally "go hunting" if they accidentally come across game while foraging. They will grab whatever weapons are available in the form of branches, stones, etc., and attack the animal and consume it on the spot with enormous excitement, agitation and vocalizations. A number of lower mammals hunt successfully without the need for large brains.

Despite the legend of man-the-hunter handing down his genes to his sons and thus passing on skill in aimed throwing, there is simply no evidence to support this notion as a model for evolution. Hunting was and is a sporadic endeavor. Apes throw quite well. Wolves hunt in packs, cooperatively, without the need for language that some have proposed derived from hunting expeditions. In fact, studies have shown that *silence*, not speech, is essential to the successful hunt.

Washburn, in an intriguing hypothesis, proposed the theory that *sharing* became important because of geographical and climatic factors. He interpreted this insight, however, in a straight Darwinian tradition. Sharing is presumed to be derived from *hunting*;² though there is little logic in this assumption. In most hunter-gatherer societies the majority of food is obtained through gathering. Another problem with Washburn's theory is that severe climatic conditions such as those during the Pliocene drought, actually drive out game. In modern day desert dwelling tribes, gathering is the primary source of food. The gatherers, Bushman women, living in harsh desert conditions will walk up to 10-15 miles a day in search of small plants and insects, carrying them back to the home base. Because of the difficulties with Washburn's hypothesis, Lancaster proposed that *gathering*, *carrying* and *sharing* are the critical factors in our evolution.⁴ She suggests that sharing began as a cooperative endeavor by females. One of the most primary distinctions between apes and men is not the proclivity for hunting, but the fact that apes are hairy and we are not. Young apes are transported by clinging to their mother's fur. Human mothers, being hairless, have to *carry* their infants. Whatever clues may be found to solve the riddle of our hairlessness, the fact remains that human beings carry their children, and this has a multitude of consequences. The propensity for carrying is available even in monkeys through ventral-ventral contact between mother and infant. In studies on Rhesus macaques carried out by Gary Mitchell at the University of California at Davis, they found that pairing infants with males produced bonding largely through play behavior.⁶ There was an almost total absence of ventral-ventral contact between infants and their male "mothers".

Here is the hint then, that one of the more radical shifts in evolution may have had something to do with the female: her need to carry her child, the reliance of the tribe or troupe on her skills in gathering food, and her ability to share both in the gathering and in the distribution of food. The bones of a theory proposing that evolutionary changes leading to *Homo sapiens* were produced somehow through selection of female specific be-

haviors is given more flesh when considering the differences between apes and men.

Differences That Make a Difference

There are four primary differences between humans and the apes all of which combine to produce the elements and artifacts of human culture. As will be seen subsequently all of these differences are female-specific aptitudes. Three of these differences are psychological. The first is language, the second a vastly superior memory and the third, self-awareness, or context dependent behavior. The final difference is a vast superiority in sequencing fine-motor behavior. In almost all other respects involving the sensitivities of sensory systems, strength, agility and so forth, apes and men are remarkably similar. As each of these differences reflects a refinement of an aptitude, not merely the possession of that aptitude, they rely on changes in *cortical* tissue.

Apes, of course, do share all of these abilities but to an exceedingly lower degree. The pioneering studies of the Gardners and those of David Premack have illustrated that chimpanzees are able to master certain aspects of language using signs or tokens, specifically nominalization and a rudimentary form of sequencing signs and symbols.⁷ The Gardner's chimp, Washoe, has subsequently invented "words" by combining two signs into a novel relationship. There is considerable debate, however, that the ape's capacity for language contains an ability to master syntax and any grammar with semantic connotations. No ape has ever been taught to utter human sounds beyond a few words, suggesting that the brain region governing the fine motor control for the vocal apparatus is undeveloped. Fine-motor control of all types is noticeably lacking.

Apes must remember in order to master language, but their memory span is short. Immediate memory involving the processing of a number of items at one time is directly related to span of attention. Maintaining items in awareness, or paying attention involves the ability to remain undistracted by irrelevant information. The outcome of processing efficiency is a more stable and functional use of coding strategies and hence retrieval from a permanent memory store. As noted above, apes use objects as tools, but generally discard them when they have obtained their goal. Remembering specific objects and noting their permanence is essential to the development of an understanding of object relationships in the physical world. It leads

ultimately to a sense of time and place. A highly developed memory for time and place is essential to a species who searches for specific foods at specific seasons and can bring food back from remote locations to a home base.

The remaining psychological distinction and perhaps the most significant to this conference is the human's capacity for self-awareness or the ability to view the self in the context of others. Self-awareness or self-consciousness therefore leads to context-sensitive behavior, specifically to the ability to imagine oneself in situations or states observed in others. This is the beginning of empathetic understanding, the beginning of rule governed behavior, and of values. It is the preliminary requirement for *sharing*. The complications of this form of consciousness will be considered later in this paper.

Female Influence on Evolution

Current data reveal that almost all of the abilities outlined above are female specific aptitudes.⁸ One, female ability in language skills of all types is well documented. Females speak earlier, use longer words and more words per utterance than males, and this facility continues into adulthood. Two, females also have superior memories for both visual and auditory information. Three, females are context sensitive. They analyze information *in the context* of each specific situation (one of the reasons, perhaps, that women are always accused of changing their minds). This is particularly relevant in social settings where female empathy has been documented at all ages. Four, females are fine-motor specialists particularly for rapid sequencing of movement and show fewer deficiencies than males in all forms of speech production, less stuttering or inability to pronounce certain combinations of sounds.

Not only are these sex differences found in humans, but the seeds of these differences exist in all non-human primate species. It may not only be because of female apes having a more docile nature that all the "talking" apes are female. Patterson reports that by age 5½ Koko had acquired 450 signs. Her playmate Michael at the same age, signs only 35.⁹ Female non-human primates are more socially oriented, more empathetic and emit vocalizations that are more often used to signal contact or to calm other troupe members. Male vocalizations are almost all agonistic, accompanying gestures of threat. Females in most non-human primate species do the major portion of grooming, and in some species are the only groomers. Prima-

tologists have suggested that the presence of grooming is the major indicator that a socially cohesive group exists.¹⁰

In hard times the non-human primate female preserves and protects her young; the male preserves himself. The skill needed to care for others and maintain life becomes essential to a social unit. Foraging for oneself does not support a social system. In terrestrial primate colonies, once the males are old enough, they are pushed out by their mothers and find themselves on the periphery of the colony. It is only through the long experience of rough and tumble play that they can then adapt and fit into a dominance order. Females and their daughters remain on the inside of the colony. This arrangement works well when all that is required is a loose arrangement to protect a large territorial domain. In a situation where sharing becomes the means of survival and cooperative behavior is essential, the food supply would inevitably be controlled by the females. The female would thus determine who survived and who did not. Infants of clever females adept at cooperative endeavors, aided by some form of gesture, or rudimentary speech, with excellent memories for place (the source of the food supply) and time (knowledge of seasons) would be the successful mothers. Sons of these mothers would survive. Sons of mothers who were inept, uncooperative and lazy would, along with their mothers, be driven out or starve.

Ultimately a type of cooperative interaction between the sexes would arise, with males maintaining and patrolling the territory, attempting to bring in food from hunting, and females providing the major sustenance within it. It is possible that the initial cooperation between the sexes came about through mother-son interactions, and only subsequently through unrelated male-female pairs. Though the division of labor with specialist functions for each sex is already present in non-human primate colonies (even pair bonding is observed in species like the gorilla), what is lacking is sharing the food supply. Those primitive peoples more able to share and cooperate, more able to value skills which could maintain a troupe, more able to specialize in order not to waste energy, would become the most effective species.

A New Male: A Conflict of Empathy and Territoriality

Cooperation, awareness of self in the context of others, extended memory, and the evolution of language to establish an effective means of organizing work parties, monitoring the young, sharing out food by learning

to count, all have implications for male behavior. The genes that effective mothers pass on to their sons cause behaviors that become integrated with male-specific activities. Two of these male activities are rituals of dominance and the manipulation and construction of tools and weapons. In some ways these are related. Darwin was the first to propose that the drastic change in the shape of the adult human skull with its small jaw and teeth came about through the invention of weaponry. Weaponry obviates the need for what Washburn has described as the "anatomy of bluff." Washburn, like Darwin, was puzzled by the presence of huge teeth in male but not female apes.² Apes are largely vegetarian, and females are as well nourished as males. Large incisors appeared to have no function.

The anatomy of bluff involves muscle mass and size as well as a number of specific muscle groups around the face and skull, permitting certain facial gestures of threat that function to promote dominance. Although intra-species aggression is exclusively male (Moyer calls this inter-male aggression),¹¹ females do have a function in establishing male dominance positions. Evidence from observations of a colony of Rhesus macaques in Oregon, shows that dominant males tend to be the sons of dominant females. The form dominance takes in the females is the observed ability to stand up for her young against threat from other mothers and juveniles. Confidence, it appears, is part of the dominance game.

With the discovery that weapons can function to promote dominance, males skilled in the manufacture and wielding of weapons would predominate and contribute to the gene pool. In times of hardship and danger, a cooperative use of weapons becomes useful and necessary. Weapons are used in hunting and in fending off invaders. Cooperative hunting with weapons and cooperative warfare or defense against attack requires *planning*. Skill in strategic warfare involves the same brain system, namely the frontal lobes, that cooperative, context-sensitive behavior involves. Thus the female capacity for cooperation and planning, passed on to her sons, combines with strength, agility, dominance, manufacture of weapons, all male specific aptitudes.

In advanced civilizations these skills and abilities have increased enormously. Yet we still find a continual shift between the female principle and the male principle. Communal life, respect for other's needs and empathy, vie with territoriality, dominance and power and an emphasis on the individual emerging from the ranks through competition. How then does this interplay emerge in human consciousness?

The Evolution of Self-Consciousness

Consciousness, the ability to pay attention, to be aware of one's surroundings, is a characteristic of all mammals. What is open to debate is whether or not other species besides the great apes and man have achieved self-consciousness. The classic test of self-consciousness has been the ability to recognize one's self in a mirror. Dogs and cats do not appear to do this. Yet social animals like dogs and wolves work cooperatively and appear to distinguish self from other. Domesticated dogs respond to human demands by signalling what appears to be similar to a sense of guilt following a misdemeanor. A dog is aware that *he* and not another has produced an unacceptable act. Thus it seems that all social animals may possess some rudimentary form of self-consciousness.

What then is unique to man? And how seriously should one consider the assumption raised by Julian Jaynes that self-consciousness only arose when man could distinguish his thoughts from the voices of Gods?¹²

It is my contention that human self-consciousness has taken two forms. One form has its roots in cooperative endeavors characteristic of all social mammals. It goes beyond this in the heightened awareness of context dependent behavior. Situational factors govern what is appropriate and what is not. Context-dependent sensitivity predicated on social systems, leads to an ever increasing refinement in the ability to read social signals, to interpret acts, to assist another and to exhibit empathy. As noted above, the ability to share, to take turns, determining what is *fair*, stem from female-specific aptitudes. The rudiments of these skills are found in all non-human primates in the act of grooming.

Once language is achieved, self-consciousness becomes a dominating force. First, it allows one to distinguish verbally between self and other. Secondly, language provides a new domain for thought, the domain of pragmatics. Whereas semantics and syntax involve cues and rules for establishing the meaning of objects and events, pragmatics enable one to determine *intent*. In recent research on mother-infant interactions, Bruner and his colleagues have discovered that a primary focus for training an infant's speech is forcing the child to specify intent. The mother responds to a request by an attempt to determine its sincerity.¹³

Requesting requires an indication that you want *something* and *what* it is you want. In the earliest procedures used by children it is difficult to separate the two. First the child vocalizes with a characteristic intonation pattern while

reaching eagerly for the desired nearby object—which is most often held by the mother. As in virtually all early exchanges, it is the mother's task to interpret, and she works at it in a surprisingly subtle way. During our analyses of Richard when he was from 10 to 24 months old and Jonathan when he was 11 to 18 months old, we noticed that their mothers frequently seemed to be teasing them or withholding obviously desired objects. Closer inspection indicated that it was not teasing at all. They were trying to establish whether the infants really wanted what they were reaching for, urging them to make their intentions clearer.

When the two children requested nearby objects, the mothers were more likely to ask "Do you really want it?" than "Do you want the X?" The mother's first step is pragmatic, to establish the sincerity of the child's request.

J.S. Bruner, *Human Nature*, 1978, 1 (9). p.46.

Note that this joint activity is carried out between *mothers* and their children, not by fathers. In fact, McGlaughlin has shown in studies on game playing, employing mother-child and father-child interactions, that only mothers attempt to determine the exact level of understanding of their child.¹⁴ This tuning process by the mother shows clearly her empathetic aptitude and her insistence that the child become aware of the nature of his/her endeavors and goals. The child becomes self-aware, *self-conscious*, through the verbal interchange of specifying intent in the context of the situation. Context sensitivity arises from a female specific ability to force linguistic competence and precision on her offspring.

The second form of consciousness is referred to by Jaynes in *The Origin of Consciousness in the Breakdown of the Bicameral Mind*. Whether or not one accepts Jaynes' view that early man was able to distinguish his own ideas and thoughts from the "voices" of the Gods, Jaynes has documented a radical shift in consciousness during the period of the early Greeks. This shift is a shift towards individualization, and I contend that it is a shift toward a male self-consciousness. It is no accident that this period saw the beginning of monotheistic religions and the birth of a new belief in the power of the individual. The concept of self *against* the others, self as unique, apart from nature and capable of controlling nature, is the beginning of man's conquest of his environment. Man *against* the world, *against* the universe, is an extension of the principle of dominance and it marks a crucial turning point in our cultural evolution. Primitive tribes consider they are part of the natural world, brothers of the animals and trees.

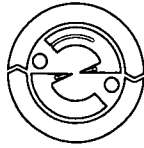
Once one recognizes that one can take charge of nature, determine its structure and change its face, one begins the long road to scientific discovery, technology and mastery of the secrets of the universe. Consciousness of the self as *unique*, rather than merely as other, is a male consciousness and is a powerful force for change.

The ultimate question then is what *value* do we put on male and female forms of consciousness and how can these forms be brought into harmony?

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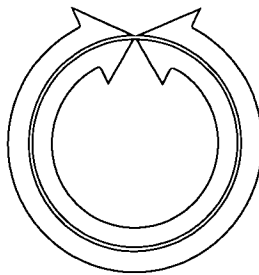
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Michael Young Warder
Secretary-General
International Cultural Foundation
P.O. Box 3939, Grand Central Station
New York, New York 10017
(212) 997-0970

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**Seventh International Conference on the Unity of the Sciences
Boston, 1978**