

**Possible Evolutionary Factors Involved in Two Classes of Human
Social Behavior—Pair Bonding and Sexual Division of Labor**

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Introduction

The study of man's origins has long been a most controversial field of endeavor. Besides being an extremely emotion-provoking subject to many people, a scarcity of evidence leaves the field open to conjecture on a large scale. Recently, traditional views of the origins of man have been somewhat overwhelmed by the rather unorthodox views of such people as Desinond Morris, Robert Ardrey, and Lionel Tiger and Robin Fox. All of these people have conjectured on a grand scale concerning man's evolution. The orientation of such books as The Naked Ape and African Genesis to the general public has perhaps served to draw more severe criticism from some scientists than might have occurred if Morris and Ardrey had limited themselves to more scholarly works. A popular orientation, however, doesn't necessarily serve to negate the scientific worth of such

speculations. Morris', Ardrey's, and Tiger's and Fox's works should be examined in the light of the present knowledge of man's emergence and perhaps some of their ideas incorporated. In this paper I will not hesitate to use any of the speculations of these authors.

On the other hand, I came across Elaine Morgan's article The Descent of Woman in McCall's magazine. Morgan's work cannot only not be called good science; it's questionable whether this sort of treatment can be called science at all. All theories of man's origins are necessarily post hoc, but only Morgan's, of all that I have reviewed,, is so subjective and obviously twisted about to suit a particular point of view. (e.g. "Now that she was getting wet all of the time, what use was the use of all that icky fur?) Morgan has done Sir Alister Hardy a disservice, and we should too, if we gave credence to such an unscientific piece of literature.

Origins

Desmond Morris has characterized man as a "naked ape" (1967). This characterization is Morris' way of pointing out that we are primates— and rather unique primates at that. Our uniqueness stems from a divergence from other primate stock that may date from five million years before present. The date for the earliest australopithecine fossil found has been set at

three million years before present (Science News, No. 2, 1974); this was a creature (of perhaps a man) which had already evolved an upright gait and a large brain, as well as the ability to make and use tools. Quite possibly these protohumans had already developed a language, and there is speculation-- although no direct evidence-- that they used fire.

Our primateness is all-important. Our primate heritage preadapted us in many ways for the later development of human characteristics once our ancestral apes ventured from the forest (Morris, 1967). An arboreal lifestyle fostered development of grasping hands and stereoscopic vision. Braciation forced development of the brain because increasing coordination became necessary. A social system of some complexity developed. All of these traits are important and perhaps essential for the evolution of man.

Leaving the Trees

At what point and for what reasons our ancestors left the forest are unknown. Conjectures have implied that changes in diet or perhaps climactic changes were responsible (Morris, 1967). John Napier (1967) has suggested that our ancestors did not move to open grassland, as had been previously thought (Morris, 1967), but instead moved to woodland savannah, and perhaps only gradually left the trees. Once on the ground,

however, our primate characteristics set the stage for development of the traits that would eventually result in Homo sapiens. It was once thought that an increase in brain size coupled with development of an upright posture freed the hands for tool use. Morris (1967) has suggested that tool use may have forced acquisition of an upright stance and an increase in brain size; i.e. the use of tools may have been a causal factor in both increasing brain size and the development of an upright posture.

Along with a change in environment, the protohumans underwent a change in diet. Primates have been known to kill small animals and occasionally scavenge (DeVore, 1965). Living on the ground probably involved more opportunities to indulge in this type of behavior than did living in the trees. Raymond Dart (1953) first put forth the hypothesis that these protohumans became killer apes. In this light, bipedalism may have evolved as a means of catching prey (Ardrey, 1961). It's doubtful that our ancestors were ever completely carnivorous, but hunting came to play an important role in the lives of protohumans. Searching and gathering also must have played an important part in the activities of our predecessors.

The evolution of an upright stance caused many physical changes in the protohumans (see fig. 1). These changes included elongation of the hind limbs relative to the forelimbs,

shortening and broadening of the pelvis, reshaping of the foot, muscular changes which served to stabilize the trunk, and straightening of both hip and knee (Napier, 1967; Campbell, 1966).

Unfortunately, the optimum reshaping of the pelvis for purposes of locomotion is inadequate for purposes of childbirth, and the optimum shaping of the pelvis for childbirth is inadequate for purposes of locomotion. It was necessary for the female protohumans to achieve a workable compromise to allow both effective locomotion and childbirth (Aloock, 1975)~ The results of this compromise can be seen by watching any woman walk. Women must rotate their pelvis more than men as they walk; this is inefficient but necessary. Women sacrificed some locomotory efficiency in order to give birth.

Other steps were taken in reaching this compromise. The pelvic region of females responds to hormonal levels which occur near the end of pregnancy by becoming quite elastic; that is, cartilage which connects the pelvic bones to one another allows them to move apart to some extent, facilitating delivery. Shortly after childbirth, the bones move back into place and the cartilage hardens. But perhaps the most fascinating development has been the degree to which human infants are born in an underdeveloped state as compared to other primates. This is called neoteny (Morris has suggested that man is hairless

because even as an adult he is in a neotenuous state).

Young humans typically take much longer to mature than other apes, and are more helpless from birth (Wilson, 1975). [1] There may be several reasons for this. One has to do with birth - if the child is born in an immature state, he may be smaller than if he were more developed and hence may pass through the birth canal easier. The other reason has to do with learning. As the brain increased in size, protohominids began to rely more on learning and less on instinct. Neoteny forces the child to be more dependent upon his parents than he might otherwise be and serves, in the case of man, at least, to extend the childhood period; the child has more time to learn before he is able to operate on his own. Hopefully, he will learn how to stay out of trouble and live to pass on his genes. Jerome Bruner (1972) has said that neoteny characterizes all primates, but certainly man has developed this trait more fully than any other primate.

The mother-child bond

Lionel Tiger and Robin Fox, in their book The Imperial Animal, propose that the mother-child bond precedes all others and is the bond upon which all others build. The physical dependency of the child on the mother for milk is an early and important development, and Harlow's (1962) experiments suggest

an emotional bond of some sort. [2] The mother-child bond may be very intense in humans due to the inordinately long time in which it is in effect. Tiger and Fox (1971) suggest that customs concerning kinship and marriage originated to protect the mother-child relationship. This supposes that the female is the principal caretaker of the child. There is evidence that females react more strongly than males to newborn infants (Wickler, 1972). Since biological constraints dictate that it is the woman who must breastfeed the child, it is likely that women early adopted the role of caretaker.

Hunting

Now we go back to the protohumans' newly developed interest in hunting. Hunting is a strenuous activity, and it tends to be an uncertain form of food-getting. There are good and bad seasons. It is much less strenuous and dangerous, and perhaps more fruitful, if hunting is done by groups rather than by individuals. Considering the already extant social system in our ancestor apes, it's likely that they hunted in bands from the very time they learned to hunt. But alternate sources of food were needed. It doesn't seem unlikely that a sexual dichotomy would arise in which the men would do the hunting, or at least most of the hunting. The mother would be hampered in the hunt by her children, and the children would be exposed to

unnecessary dangers. This type of division of labor may have originated millions of years ago, and may have remained relatively stable for thousands of generations, with men doing the hunting, both sexes gathering food, and the women caring for the younger children.

Pair bonding

The dependency of the female on the male when the male is engaged in a major food-getting activity such as hunting should be as apparent as the male's dependency upon the female for food she may have gathered while he was off on an unsuccessful hunt. Both must be assured that sharing will occur if either has hard luck. It would be to the advantage of both sexes to form lasting relationships in which each individual could depend upon at least one member of the opposite sex to share food with. Such lasting relationships are called pair bonds (Norris, 1967; Alcock, 1975; Reynolds, 1968) [3] The formation of pair bonds does not imply monogamy or any other gamy; it does imply that the tendency to form such long-lasting relationships between the sexes is genetically programmed.

Discussion

I have attempted to show how pair-bonding and division of labor between the sexes may have hereditary components due to

evolutionary factors. I feel that I must play the devil's advocate a bit here: Margaret Mead found three completely different cultures of humans living within a very short distance of one another in New Zealand (1935). [4] There were rather dramatic differences in sex roles in the three cultures, and it seemed unlikely that genetic differences could account for those differences. John Alcock (1975) has made a rather heroic attempt to explain the differences in terms of heredity, and succeeds in forcing the issue into a stalemate.

To what extent behavior is hereditary and to what extent it is learned will probably always be an unresolved problem, but I have been convinced from studying animal behavior that nature plays an important part in behavior. Pair-bonding and sexual division of labor almost certainly have hereditary components.

I have also attempted to show how evolution has interacted with the social structure of protohumans to produce human behavior. If man had been asocial he almost certainly would never have become man. His social nature played an important part in shaping his development.

Implications

If pair-bonding and sexual division of labor are primarily or even partly hereditary, then perhaps we can come closer to understanding ourselves in our social context. It could not be

easy to fight millions of years of evolution. Only by gaining as complete a knowledge of ourselves as we can attain will we be able to overcome such obstacles as sexual discrimination. By understanding the origins of such discrimination we can better combat it.

Notes

1. For a discussion and comparison of the development of the young chimpanzee, see Wilson (1975), pp. 347–348.

2. See Appendix A for a synopsis of the work of Harlow with infant monkeys.

3. Morris has speculated that human females are sexually receptive at all times because of the pair bond. Constant sexual access discourages infidelity. It is interesting that of all primates only humans lack an estrous cycle in which the female is receptive only at certain times. Morris also hypothesizes that humans have sex front-to-front, again unique in all primates (with the exception of some anecdotal evidence with chimpanzees) because of the pair bond.

4. See Appendix B for a synopsis of the work of Mead's 1935 work.

* Appendices A and B from Alcock

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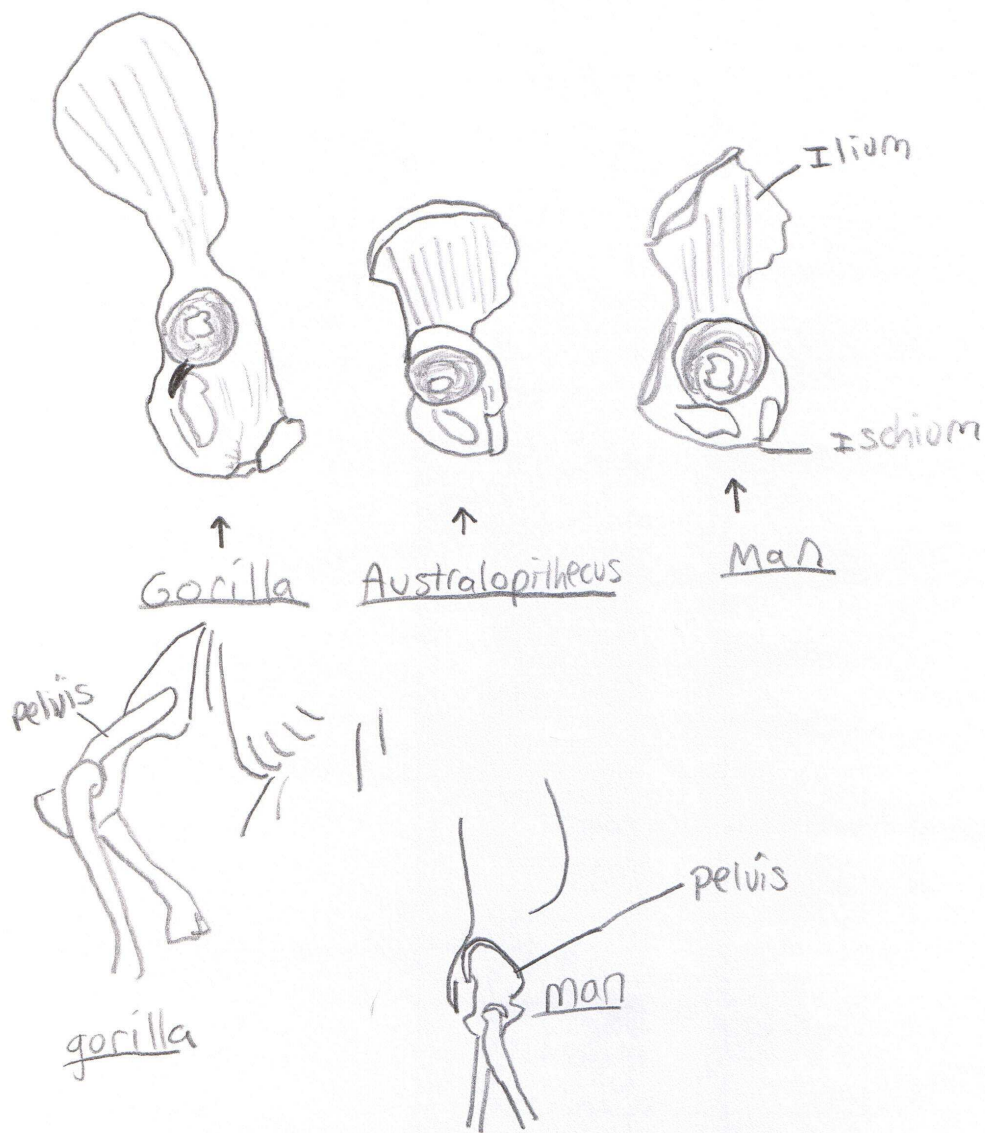


Fig. 10. Pelvis' of an ape, an early hominid and modern man

from Napier

Fig. 2 Adoption of a Hunting way of Life 12

