

The Origins and Nature of Sociality

EDITORS

Audrey R. Chapman

Robert W. Sussman

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I

INTRODUCTION



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1

The Nature and Evolution of Sociality

Introduction

Robert W. Sussman and Audrey R. Chapman

A BRIEF HISTORY OF THIS VOLUME

This book results from a symposium sponsored by the Program for Dialogue on Science, Ethics, and Religion (DoSER) of the American Association for the Advancement of Science (AAAS). The symposium, which took place in January 2001, was cochaired by the editors of this volume. Among the goals of DoSER is to increase the engagement of scientific communities in the dialogue on science, ethics, and religion, and to facilitate collaboration among scientists, ethicists, and religion scholars to address critical multidisciplinary issues related to these topics. A further goal is to increase public understanding and appreciation of science and improve the level of scientific understanding in religious communities.

Increasingly, scientific developments over the past century have been transforming our understanding of humanity's place in nature as well as the very nature of human beings. The study of humanity, carried out in a variety of disciplines, from anthropology and paleontology to genetics and the neurosciences, is shedding new light on human origins and the biological bases of human nature and culture. The findings of these sciences can have profound implications for the interpretations of human nature and the determinants of human behavior within the religious traditions of humankind. Sometimes these developments raise challenges to long-held religious beliefs.

This is certainly true in the case of sociobiology. Sociobiology, more recently referred to by many as evolutionary psychology, Darwinian anthropology, or evolutionary anthropology (Wright 1994; but see Mysterud, in press), offers a radically selfish and individualist account of human nature vaguely reminiscent of the concept of original sin (and many sociobiologists refer to this religious metaphor). But despite conceptions of

human beings as inherently limited and flawed, many religious traditions also put forward a concept of the common good, an understanding of the individual as a self-in-community, and a vision of *Homo sapiens* as a basically social and interdependent species. Judaism, Islam, and Christianity generally understand persons as moral and social beings created to live in communities linked by relationships of mutual caring and responsibility. Sociobiology's portrayal of human nature strips away the potential for genuine moral and social development.

At the time we began this project, the paradigm put forward by sociobiology dominated the literature, both popular and scientific, and public conversations about evolution, animal behavior, and human nature. Proponents of sociobiology characterize human conduct as ruthlessly selfish and relentlessly driven by an intense drive to compete with others for natural resources and reproductive advantage (see, for example, Wilson 1975, 1978; Dawkins 1976; Wright 1994; Ridley 1996). Human beings, like all animals, are viewed as controlled by their genes to improve their prospects for survival and reproduction. In its more extreme versions, sociobiology proposes that genes are the main units of natural selection and reduces human persons to little more than vehicles for their genes. According to Richard Dawkins, human beings, like all animals, are basically survival machines created by our genes. Taking the license of writing about genes as if they had conscious aims, Dawkins writes that genes control the behavior of their survival machines, "not directly with their fingers on puppet strings, but indirectly like the computer programmer" (1976:56). In this model, gene selfishness gives rise to selfishness in the behavior of both animals and humans that in turn leads to continuous and necessary competition between individuals.

This reductionism and biological determinism extend to the interpretation of culture. Genes hold culture on a leash, a long leash, but a leash nevertheless (Wilson 1978:167). In Dawkins's scenario, the struggle for survival produces brains, and brains in turn give rise to a new kind of replicator termed "memes." Memes constitute units of cultural transmission or mental entities in the form of ideas, concepts, or ways of making things that are analogous to genes and follow a vaguely similar process of evolution (1976:206). And like genes, memes are selfish and try to dominate the brain's thought processes at the expense of rival memes. Dawkins treats the idea of God as a very old meme that probably originated many times by independent "mutation" and persisted because of its survival value (ibid.:207). And what about the concepts that religions and ethicists value? "Much as we might wish to believe otherwise, universal love and the welfare of the species as a whole are concepts which simply do not make evolutionary sense" (ibid.:2).

Proponents of sociobiology acknowledge that there are special circumstances in which animals and persons exhibit cooperative, friendly, even

seemingly sacrificial behavior, but they seek to explain this away by reducing these social behaviors to a biological survival strategy to achieve selfish goals. To put it another way, in order to improve our ability to survive, natural selection has vested us with a capacity to be cooperative. As a strategy to maximize opportunities for reproduction, it makes sense in some circumstances for an animal to take risks to protect members of its own kind who share its genes. Thus most forms of seemingly altruistic behavior tend to be demonstrated to close relatives. Additionally, animals, and by extension humans, engage in forms of mutually advantageous reciprocal altruism—the principle “you scratch my back, I’ll ride on yours” (ibid.:179). Sociobiologists generally deny that such forms of kin or reciprocal altruism are in any way comparable to traditional ethics.

Likewise, in the sociobiological account, human beings are ethical solely because morality is a strategy to promote self-interest or, more specifically, to preserve their genes. So why do we believe that we are ethical? To be effective, genes somehow have to convince us that we are behaving cooperatively because we believe it is right to do so, not because it is in our evolutionary interest, and hence the emergence of ethics (Wilson 1978, 1998; Ruse and Wilson 1985; Ruse 1987, 1991; Wright 1994; Sommer 2000). In this convoluted explanation, moral beliefs are “no more than a collective illusion fobbed off on us by our genes for reproductive ends” (Ruse 1991:508).

In its “classic” form, sociobiology claims that genes, not their carriers, are necessarily selfish. Although E. O. Wilson characterizes humankind as an aggressive species, he attributes the incidence and severity of violence not to selfish or aggressive genes or a pervasive aggressive instinct, but to factors in the environment, particularly social stress (1994:167–70). That said, however, claims that selfishness and violence are somehow biologically built into human nature are currently receiving considerable attention.

In *Demonic Males: Apes and the Origins of Human Violence*, a work that has received considerable attention, primatologist Richard Wrangham and science writer Dale Peterson resurrect the theory that hunting, killing, and extreme aggressive behaviors are inherited biological traits. Taking issue with the assumption of many scholars that human aggression is relatively unique, they reinterpret previously collected empirical data, once viewed as showing the great apes to be basically unaggressive, gentle creatures, to contend that the inclination to kill other members of one’s species is a defining mark of our closest relative, chimpanzees, as well as humans (Wrangham and Peterson 1996). Since humans and chimpanzees share an inherited propensity for killing, they argue that human violence has long evolutionary roots and is likely to be fixed. Wrangham had earlier claimed, with little evidence, that chimpanzees were a conservative species likely to resemble the common ancestor from which both species evolved (Wrangham 1995). Wrangham and Peterson attribute the origins of this “demonic”

tendency to the existence of unique patrilineal, male-bonded kin groups that these species form with each other to attack outsiders. They also base their belief that humans were favored by natural selection to hate and to kill their enemies on the sociobiological tenet of the selfish gene (1996:23). To explain why humans and chimpanzees are so different from bonobos, our equally close genetic cousins who are one of the most peaceful and socially oriented species, they point to the absence of male bonding, attributing differences in fundamental social patterns to variations in the nature of the food supply among the groups (*ibid.*:220–30). This explanation, which suggests that violence and nonviolence are equally adaptive responses to the environment, contradicts their fundamental claim that humans and chimpanzees have inherited aggressive, fixed biological traits.

Other primatologists have provided a very different interpretation of our evolutionary ancestry. As the title of Frans de Waal's book *Good Natured* (1996) implies, his characterization of chimpanzees emphasizes their sociability and incipient morality, not their inherent violence. In a spoof of Wrangham and Peterson, Sussman uses similar logic to propose a less serious, but no less feasible, theory of the evolution of human behavior—man the dancer. He points out that the evidence for a love of dancing as a motivating source of other human adaptations is certainly as good as that for hunting or killing (1999:456–57).

Sociobiology has always had its critics, among them many prominent evolutionary biologists, paleontologists, and naturalists, such as Richard Lewontin, David Hull, Stephen Jay Gould, Niles Eldredge, and Russel Gray, concerned about the lack of compelling scientific evidence offered by proponents and its simplistic reductionism and genetic determinism (Lewontin, Rose, and Kamin 1984; Hull 1988; Eldredge 1995; Gould 2000). Stephen Jay Gould, for instance, dismissed the selfish gene model as based on logically erroneous premises (2000). Niles Eldredge takes the “ultra-Darwinists” to task for their narrow scientific agenda and failure to take the existence of larger-scale entities, such as species and ecosystems, seriously or to view them as something more than simple epiphenomena borne out of competition for reproductive success (1995:223–27). Russell Gray implicates the lack of proper knowledge of molecular and developmental biology and suggests we shift our attention to the evolutionary dynamics of developmental systems (2000:184–207).

In the sociobiology literature, there is no meaningful way of looking at affiliative behavior. Yet many evolutionary biologists have recognized the importance of sociality and cooperation among members of a species or a group. In his seminal book *The Descent of Man*, Charles Darwin (1871) acknowledged that many of the most praiseworthy human qualities appear to benefit others at expense to self, such as honesty, charity, and

heroism. Darwin attributed the emergence of these characteristics to the fact that natural selection sometimes acts on groups, just as it acts on individuals. As such, although an altruist may have fewer offspring than a nonaltruist, groups of altruists will have more offspring than groups of nonaltruists. In addressing the issue as to whether human evolution by natural selection allowed for moral sensibilities and social behavior, Darwin had this to say:

It must not be forgotten that although a high standard of morality gives but a slight or no advantage to each individual and his children over the other men of the same tribe, yet that an increase in the number of well-endowed men and advancement in the standard of morality will certainly give an immense advantage to one tribe over another. (1871:166)

Anticipating by many decades the work of population geneticists and current research on the role of group selection, Darwin described the advantage to human communities with a strongly endowed moral sense, such as “patriotism, fidelity, obedience, courage and sympathy,” and a willingness “to aid one another, and to sacrifice themselves for the common good,” over societies with lesser acquisition of such qualities and characterized this as natural selection (*ibid.*).

Similarly, in his book *Mutual Aid* ([1902] 1987) written a century ago, Petr Kropotkin amassed a wealth of data showing how cooperation and mutual assistance among members of a species may act as a countervailing force against the natural competitive and aggressive instincts of individual members of an animal group or a human community. Kropotkin, a Russian nobleman, humanist, and anarchist, was a highly respected geographer, geologist, and zoologist, who was awarded a gold medal by the Russian Geographical Society for his work on the geographic structure of Asia (Montagu 1987). For Kropotkin the ability of members of a species to cooperate and share resources, whether they belonged to the “lower animals,” primitive societies, or present-day human communities, conferred advantages. He viewed the capacity for mutual aid as an important and determining factor in biological and human evolution. Kropotkin attributed the evolution of moral teachings among religious, philosophical, and humanistic movements to the principle of mutual aid becoming more and more ingrained in human consciousness ([1902] 1987). Although *Mutual Aid* was widely read and influential, Montagu (1987) states that “it has also suffered some misunderstanding on the part of those who know of the book at second or third hand.” Many believe that Kropotkin was anti-Darwin but this was not the case. Kropotkin was greatly influenced by Darwin’s concept of natural selection but was highly critical of Huxley’s

evolutionary extremism and strongly social Darwinist interpretations. (See Killen and de Waal 2000 for a further discussion of Kropotkin and nineteenth-century debates about the evolution of morality.)

Despite its promise, the concept of group selection, which provided an evolutionary explanation for the emergence of altruistic and cooperative behavior, did not find much favor with the established schools of evolutionary biology. Recently, however, Elliot Sober and David Sloan Wilson have reinvigorated debate on the importance of group selection as a basis for understanding the role of altruism and cooperative behavior in biological evolution. In their landmark book, *Unto Others*, Sober and Wilson (1998) draw on four disciplines—evolutionary biology, social psychology, anthropology, and philosophy—to demonstrate that unselfish behavior is an important feature of both biological and human nature. Offering evidence from self-sacrificing parasites to insects and other animals and finally the human capacity for selflessness, they explain how altruistic behavior can evolve by natural selection. The message of their book is that natural selection is unlikely to have conferred purely egoistic motives.

In addition to the work on group selection, there is a complementary stream in the evolutionary literature with the view that there are certain emergent qualities in human evolution that cannot simply be reduced to genetic or biological factors. It recognizes that human beings and to a lesser extent primates, as well, have a capacity for affiliative behavior at least partially due to adaptive changes. Intellectual capabilities give rise to an additional overlay of cultural evolution in human communities. Researchers also have shown that some primate communities demonstrate the existence of a protoculture in the form of distinctive learned behaviors and social responses (Itani 1958; Kawai 1965; McGrew, Marchant, Scott, and Tutin 2001; Perry et al. 2003).

Theodosius Dobzhansky, the eminent population geneticist whose groundbreaking studies on the fruit fly paved the way to a comprehensive understanding of the genetic mechanisms at work in the evolutionary process, for one did not understand human evolution as a purely biological process. Instead he characterized human evolution as shaped by two components, the biological or organic and the cultural or superorganic, interacting through a series of nonlinear, feedback interactions between biological and cultural processes (Dobzhansky 1962).

Francisco Ayala, an evolutionary biologist, philosopher, and man of letters who studied with Dobzhansky, puts forward a view that acknowledges the evolutionary origins of morality, but still affirms the objective and independent basis of ethical systems. Like the sociobiologists, he accepts that the high intellectual abilities present in modern humans are an outgrowth of the process of evolution directed by natural selection. Unlike the sociobiologists, he posits that moral reasoning, that is, the pro-

clivity to make ethical judgments by evaluating actions as either right or wrong, emerged as an outgrowth of human intellectual development and not because it conferred biological benefit (Ayala 1995, 1998). Ayala also makes the point that the justification of ethical norms on the basis of biological evolution or any other natural process is a reversion to the naturalistic fallacy, the confusion of “is” with “ought.” He cautions that the confusion of evolutionary processes with morality seems to justify a morality consistent with a social Darwinism most of us would find abhorrent (Ayala 1995:126). Ayala further underscores the need to differentiate between genetic predispositions and genetic determinism. While a natural predisposition may influence our biological nature, it does not constrain or force us to behave accordingly (ibid.:128).

AAAS PROJECT

The AAAS project grew out of a desire to find alternative and more scientifically valid ways to understand the biological bases of human sociality. Believing that primatology may offer significant comparative insights into the evolutionary foundations of human nature, the coeditors decided to hold a series of research workshops linking primatology and the evolution of human behavior. Because our ancestors are extinct and the paleontological record is limited, living nonhuman primates and ethnographic studies of contemporary human foraging cultures (Boehm, chapter 13 in this volume) offer important potential models of the biological and social foundations of human nature and society. Moreover, our view of humanity has often been influenced by our interpretation of the behavior of other animals. However, the use of research on nonhuman primates to inform the human sciences on ethics and constructive or systematic religious thought about human nature raises serious methodological and interpretative issues.

To provide a setting to explore the interdisciplinary relationships between contemporary primatology, other human and biological sciences, and religious thought and ethics, the AAAS Program for Dialogue on Science, Ethics, and Religion convened a series of research workshops and symposia at the annual meetings of AAAS and the American Anthropological Association. The first was held in 1998. At the time of these meetings, A.R.C. was Director of DoSER and R.W.S. served as a consultant to the program and editor-in-chief of the *American Anthropologist*, the flagship journal of the American Anthropological Association (AAA). In this series of research symposia and conferences the contributors have begun to address four broad questions: (1) What do current studies of higher primates tell us about their nature, sociability, inclinations to violence, and

rules of behavior or “protoethics”? (2) Why do researchers disagree so significantly on the interpretation of these studies? (3) What relevance, if any, do these findings have for understanding the biological foundations of human nature? (4) What is the ethical and theological relevance of these findings (e.g., do they illuminate questions of theological anthropology such as the nature of human sin)? Theological anthropology is the study or interpretation of human nature, what distinguishes us from other species, and the foundation of a moral life from a faith perspective (see, for example, Pope 1998).

Two major research workshops sponsored by DoSER were held in Washington, D.C. Each of these brought together fifteen to eighteen researchers drawn from primatology, paleoanthropology, biological and cultural anthropology, biology, psychology, genetics, philosophy of science, ethics, and theology. A core of researchers participated in both conferences.

The first was held in October 1998. The goal of this workshop was to begin a dialogue on the subject of the evolution of human nature and to examine the status of some of the various data and theories currently available on that subject, focusing especially on primatology. The participants focused on methodological issues concerning the interpretation of primatological data and their inferential applicability for understanding the biological basis of human nature. Although participants were asked to prepare presentations on specific topics, no formal papers were presented. In this initial workshop, participants refined the focus of potential future conferences and identified possible future paper topics and potential authors.

During the concluding session of the first workshop, a consensus emerged that the second meeting should focus on the evolution and nature of nonhuman and human primate sociality. It also was suggested that emphasis should be placed on careful discussion of techniques of data collection and on methodology. This book results from the second research workshop, which took place in January 2001.

THEORETICAL BACKGROUND

All diurnal primates (those active during daylight hours), from prosimians to humans, are highly social. Furthermore, with the exception of orangutans, these primates habitually form and travel in cohesive social groups. However, group-living individuals must forgo some of their individual freedoms in order to socialize within the “group.” In a broad sense, the compromises that individuals make, the mechanisms they use, and the means by which they maintain these social groups are what we refer to as “sociality.”

What are some of the compromises that individuals make for this sociality? Are there certain behavioral traits shared by all social primates (mammals), and are these traits homologous or analogous? Are there hormonal correlates to sociality? Are there different patterns of sociality between and among primate species? Do any of these patterns manifest themselves in human behavior? How does this relate to the evolution of human sociality? What kinds of mechanisms do various primate species and human cultures use to socialize individuals in order to maintain species typical or "normative" groups? What are the differences in these traits given different ecological and social parameters (such as group size, number of males or females in a group, patterns of migration, group structure)? These are some of the questions relevant to an inquiry into the roots of human sociality.

In this volume, available data on primates and other social animals were examined in an attempt to understand the nature of the adjustment that individuals make in order to successfully live in social groups. The amount of time primates spend in social interaction is examined along with how such interactions relate to other behaviors, such as feeding, traveling, and general maintenance behaviors. Human societies are considered with particular attention to the variable nature of human cultures as well as the behaviors that are valued cross-culturally in relation to human sociality.

These various data contribute to the formulation of questions concerning the relationships that might exist between sociality, morality, and ethics. Such questions include: What are some of the general rules that animals must follow in order to maintain sociality, and might some of these be precursors to similar rules in humans? What specific traits need to be developed by nonhuman and human primates in order to maintain sociality and are any of these similar across species? Can behavioral patterns and mechanisms used for the fostering and maintenance of nonhuman and human primate sociality be related to the evolution of morality and ethics?

In the first conference there was discussion of how many of the current theories on the evolution and biological basis of human behavior are based on presuppositions without an adequate analysis of the data. It was noted that often such theories make selective use of available data. In this volume, we pursue this methodological concern by critically examining both the data and the methods used in developing theories about sociality among humans and other primates. This we hope will lead some to reevaluate available data and to attempt to develop new theories more adequate to the data. To accomplish this will require careful attention to the terms used in developing theories related to the evolution and biological basis of human behavior. The sorts of questions needed to be asked are: How good

are the data? How good are the methods employed to interpret the data? How adequate are the explanatory theories in relation to the data? Are the terms used in cross-species comparisons suitable for this purpose?

In this set of contributions, we focus on the current status of research on sociality and the evolution of social behavior, especially but not exclusively, in nonhuman and human primates. The authors examine questions related to the evolution, cultural variability, and hormonal underpinnings of human sociality and describe patterns of sociality among nonhuman primates and how they may shed light on human social behavior.

We have found that within primate groups, affiliative and cooperative behaviors are far more frequent than agonistic behaviors. The most currently popular paradigm hypothesizes that positive social interactions are a reaction to competition necessitated by group-living or that they serve as reconciliatory behaviors between competing individuals. However, if conditions favor cooperative behavior among both kin and nonkin group members, and these outweigh any negative conditions, natural selection could favor cooperative social interactions *in their own right*.

Currently there are few theories that present the case that primate and human sociality may be driven by factors other than aggression and self-interest. The basic aim of this volume is to present alternative hypotheses and to base these alternatives on what we believe to be better biological evidence and more appropriate genetic and evolutionary approaches than the sociobiology paradigm.

SYNOPSIS OF THE CONTENTS

The book is divided into six sections. In the second section, the authors describe proximate behavioral mechanisms that provide underpinnings to sociality. Zihlman and Bolter describe the importance of the mammalian system of mothering and infant care and development in the evolution of sociality. By contrasting individual life strategies and species life histories (for example, in elephant seals, elephants, and some primates), they illustrate the connection between these factors and the size and complexity of social groups, and the development of human culture. They maintain that sociality and "the integrity of the community is maintained over the long haul through the emotional and social bonds that are formed during maturation and the affiliative skills practiced throughout life, rather than through frequent aggression and fighting" (p. 37). Bekoff discusses social play behavior in mammals and its role in the evolution of cooperation, fairness, and sociality. He argues that some animals have codes of social conduct that regulate their behavior in terms of what is and what is not permissible during social interactions. Furthermore, he believes that the

study of mammalian social play can help us learn more about the evolution of social morality in humans and other animals. Bernstein points out that the frequency of agonistic interactions is correlated with the time individuals spend in proximity, with aggression being more frequent among those in close proximity, including kin. Agonism is often a proximate result of sociality. He describes the normal context of many aggressive behaviors and a number of ways individuals control aggression in social groups. Bernstein, however, stresses that many of these behaviors do not have the “goal” of “peacemaking.” Proximate causes and function are distinct. He emphasizes that social bonding may be less exciting than functional theories of reciprocity, bartering services for favors, punishing cheaters, and scheming like Machiavelli’s prince, but it is more parsimonious than assuming that animals understand functional consequences of their behavior, plan accordingly, and consciously strive to improve their genetic fitness.

The third section of the book deals with hormonal, neurological, and genetic factors related to sociality and its evolution. Carter and Cushing describe specific hormones that influence general sociality, the capacity to form social bonds, and parental behavior. These neurochemicals and their receptors are regulated by genetics as well as epigenetic factors and may help to account for species-typical variations in social behavior. These authors summarize current understanding of these physiological mechanisms underlying mammalian sociality. Ahn, Janssen, and Ostrom focus on cooperation, mainly among humans, in situations where the temptation to defect exists. They argue that the ability of humans to use signals and symbolic systems, and the biological and mental capacities related to this, facilitate cooperation and stimulate the development of large-scale and complex social organization. It is interesting to note, however, that many of the factors described by these authors as unique to humans can be shown, at rudimentary levels, in other animals, as seen in chapters throughout this volume (see, for example, Bekoff on play signals and Watanabe and Smuts on greeting rituals). Chleverud carefully explains that Darwinian evolution occurs by the natural selection of heritable variation. He illustrates how these factors are measurable and describes some common misconceptions concerning these terms. Chleverud then develops a model of the potential for the evolution of sociality and cooperation under naturalistic selection with direct benefits for interacting parties. He stresses the need to actually measure fitness consequences for both the actor and the recipient in social interactions rather than assuming selection based on incomplete information.

The fourth section includes chapters on patterns of primate sociality. From a survey of the literature on diurnal primates, Sussman and Garber find that, even though almost all of these primates live in permanent social

groups, very little time is spent in active social interaction. Furthermore, the overwhelming majority of these interactions are affiliative and only a minute proportion of them are agonistic. Given these findings, they point out the need to carefully examine patterns of sociality in the context of normal daily life and they call for a reevaluation of the conventional wisdom that primate sociality is driven by competition and aggression. Strier examines how dispersal and resident patterns directly affect the opportunity for, and patterns of, interactions among nonkin and different categories of biological kin in various nonhuman primate species. An important distinction between nonhuman and human primates has been the latter's ability to maintain both kin and nonkin relationships without coresiding in the same group by classifying and keeping track of relationships through language, although Strier takes the argument further by illustrating how demographic conditions can affect social bonds. She points out how different demographic conditions can either permit or preclude the development of certain categories of relationships, independent of whether the differences in these relationships are recognized. Fuentes examines the wide degree of variability in what is considered postconflict behavior, especially behavior considered reconciliation. He shows that it is extremely difficult to disentangle cooperative relationships and relationship histories of individuals from the conflicts in which they engage and how they behave before and after these conflicts. He concludes that rather than having an evolved set of behavioral responses to conflict, normal "patterns of cooperation and affiliative relationships may be important causal factors behind observed postconflict behavior" (p. 231).

In the fifth part, the authors focus on the evolution of human sociality. Tattersall emphasizes the importance of understanding mechanisms of macroevolution in developing theories of the evolution of human cognition and sociality, and he warns that the currently popular "adaptionist" paradigm is too simplistic. He argues that modern human behavioral characteristics are founded upon the basic higher primate (diurnal, group-living, intensely social) qualities already possessed by the common hominoid ancestor. However, their unique qualities are the product of a recent, fairly abrupt, and emergent event, resulting from a chance coincidence of innovations. Tattersall urges us to remember that adaptations do not have independent existences and that evolutionary processes work on whole organisms and taxa, not on constituent parts of individuals. Potts describes a distinctive suite of archaeologically detectable behaviors that mark the emergence of modern humans and the long period of ecological unpredictability during which modern human behavior emerged. He argues that this volatile environment impacted the social fabric of early humans and led to symbolic expression and language. These factors, he believes, impart a peculiar quality to the personal and social behavior of *Homo sapiens* and make understandable the origin of a spiritual sense.

Potts outlines “how the cultural behavior characteristic of modern humans emerged from a *paleocultural* (emphasis in original) system of earlier humans” (p. 250), and he emphasizes the need for a redefinition of the concept of culture. Boehm uses a cladistic methodology, based on a comparison of the behaviors of our closest ape relatives, to infer certain behaviors of our earliest human ancestors. Combining these inferences with ethnographic analogies based on modern human foraging cultures, he develops a preliminary model of the evolution of human sociality and the development of human morality. Watanabe and Smuts “address the relationship between continuities and transformations in the evolution of human sociality through discussion of the social cooperation and commitment” that they see as “intrinsic to both human and nonhuman primate communication” (p. 288). Further, they ask “what difference does having language and culture make in human sociality?” (p. 288). They develop the argument that language presupposes and intensifies social cooperation already present in nonhuman primates, and they use ritual greeting behavior among baboons to illustrate this point.

In the concluding essay, Pope summarizes the chapters in the volume and puts them into the context of historical, theological, and philosophical perspectives on natural law, ethics, and moral reflection. He traces how the Hobbesian perspective of the competitive nature of humans has greatly influenced the current theories of sociality from Darwin to the present. However, he points out that earlier philosophers, such as Aristotle and Aquinas, saw human sociality quite differently, as part of a classical natural law tradition. These philosophers believed, as does Pope, that human sociality is “primary and not simply derivative from instrumental purposes . . . ; it is essential to human well-being, rooted in biology as well as intelligence, and not a dispensable addition of culture” (p. 323). Pope argues that the primate studies described in this book offer an alternative to the currently dominant paradigm. He states that:

If other primates are prone to social behavior more often than antisocial behavior, perhaps pity, empathy, and other prosocial feelings do not have to be laid on top of a substrate that is essentially antisocial. . . . An alternative position, and one that retrieves Aristotle’s notion of the human being as a “political animal,” can draw some help from this prosocial view of primatology in viewing society as a network of communities that make a positive contribution to human well-being. (pp. 328–329)

FUTURE PLANS

We hope that this volume will not be the only one produced from this initiative. In our original plans, we envisioned four major conferences. As

described above, two of these have now been accomplished. Two future conferences are in various stages of development. In these future meetings, we will explore further many of the ideas presented in the current volume. In our third conference, we plan to focus on the origins and evolution of human cooperative and altruistic behavior and build on discussions on primate sociality. The nature of human altruism is a topic that has perplexed evolutionary biology and is one of considerable interest to both the social sciences and the religious community. For example, media coverage of the response to the September 11 tragedy documented many examples of courage, and cooperative and altruistic behavior in response to this terrible event. Yet, as discussed above, many socioecologists and sociobiologists believe that social animals, including human and nonhuman primates, are cooperative and altruistic only if they have something to gain from their actions. However, the reaction of millions of people to the September 11 event does not fit this paradigm. As the *New York Times* (Angier 2001) reported:

Hearing of the tragedy whose dimensions cannot be charted or absorbed, tens of thousands of people across the nation storm their local hospitals and blood banks, begging for the chance to give blood, something of themselves to the hearts of the wounded.

In the literature on social primates, including humans, and other social mammals it is not difficult to find a multitude of examples of altruistic behaviors that do not fit the commonly accepted paradigm. In fact, there is a great deal of slippage in the currently popular theories of altruism. As the *New York Times* article continues: "As biologists are learning, there is more to cooperation and generosity than an investment in one's nepotistic patch of DNA." A large number of behavioral, hormonal, neurological, genetic, and computer studies and theoretical models drawn from them are beginning to offer alternative explanations for cooperative and altruistic behavior. However, scholars working on this subject from different disciplines have seldom communicated with one another, and these data have yet to be synthesized. This will be a primary goal of our next conference.

In the final research conference, we will address the topic of the origin and evolution of morality. We will consider the requirements for morality and the extent to which critical precursors of human morality are present among various groups of primates. This conference will also evaluate whether there is evidence for "protoethical" rules of behavior among primates and, if so, how these rules might be related to the development of human morality. Findings related to patterns of altruistic behavior among primates and whether the "selfish gene" hypothesis is able to explain the basis of such behavior will be yet another topic for discussion. Finally, we

also hope to explore the question of whether kin-based altruism and reciprocal altruism are a sufficient foundation for moral relationships among groups of primates and human beings, or whether there are other behavioral, genetic, and neurological mechanisms that can help explain human morality that is not based on purely selfish considerations.

CONCLUDING REMARKS

The authors of chapters in this volume come from a diversity of fields, including anthropology, primatology, sociology, political science, paleontology, biology, psychology, psychiatry, genetics, neurobiology, ethics, theology, philosophy, and science and religion. We believe that the book will be of interest to individuals in all of these disciplines. The volume is written so that it is accessible to both an academic and an educated popular audience. We, further, believe that the volume can be used for both undergraduate and graduate courses in a number of the above fields and possibly even in high school courses. Professionals seeking alternative explanations for cooperative behavior will find the book extremely useful, and we hope that it will stimulate discussion, controversy, and an impetus for other researchers to delve into theories that are at odds with some of those currently in vogue.

As we all know from recent history, some “scientific” theories, such as social Darwinism and eugenics, can become very popular both among scientists and among the general public, and yet they can be very, very wrong. Thus, even though some theories may gain a great deal of scientific support and general popularity, it is important that alternative hypotheses be presented in the literature. We believe that many of the current theories on sociality are often accepted as if they are truisms much like the theories of social Darwinism and eugenics were in the past. This volume presents ample evidence that there are alternative and more convincing hypotheses that may lead to better explanations and to a better understanding of patterns of nonhuman and human primate sociality.

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II

Origins of Sociality



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2

Mammalian and Primate Roots of Human Sociality

Adrienne L. Zihlman and Debra R. Bolter

AN EVOLUTIONARY APPROACH TO SOCIALITY

Sociality, the preference for living in a community rather than in isolation, is central to human survival and reproduction. It is as much a product of evolution as is hominid bipedal posture and a large brain. It forms the foundation for maintaining traditions and for developing human language and culture. Indeed, sociality is a necessary prerequisite for culture.

The social nature of *Homo sapiens* has its roots in mammalian and primate biology and behavior. Human social life continues the mammalian system of caretaking, in which females produce milk, infants suckle, and females and young maintain contact through olfactory, tactile, and vocal modes of communication. Primate ancestry elaborates the mammalian base through extended life stages; longer infancy and juvenility, later maturity, and a long life span all increase the potential for intense and long-term social interaction. By keeping close contact with the infants they carry, females remain mobile and integrated into social groups of all age-sex classes that associate throughout life. Primate color vision and vocalizations enhance interindividual communication and group cohesion.

The human lineage further elaborates the primate base, initially through a shift to bipedal locomotion and, later, through an enlarged brain. Compared with other primates, *Homo sapiens*, originating in Africa about 150,000 years ago, added a distinct childhood stage, prolonged adolescence, and lengthened the life span. The fossil, archaeological, and molecular records provide a time dimension and a context for estimating the emergence of modern human life stages, symbolic activity, abstract material culture, and communal life ways.

In this chapter we argue that human culture cannot be disassociated from social life and therefore from humanity's mammalian and primate