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Book Review

I, Primate

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A review of Shirley Strum and Linda Fedigan (eds), *Primate Encounters: Models of Science, Gender and Society*, University of Chicago Press, Chicago, 2000, xvi + 635 pp. (Hb) ISBN 0-226-77754-5, $35.00.

Sarah Blaffer Hrdy, *Mother Nature: A History of Mothers, Infants, and Natural Selection*, Pantheon Books, New York, 1999, xix + 723 pp. (Hb) ISBN 0-679-44265-0, $35.00.

Biological science is, often enough, anthropology by other means. As with the interests of everyday folk, those of biologists are not impartially distributed throughout the living world, and much of what makes a living organism, system, or process valued in research is its relationship to one species in particular, *Homo sapiens*. It is the putative medical benefits to follow from the Human Genome Project, and its importance for understanding "who we are", for understanding human nature, that have featured in large print in the justifications given for the project's funding. Experimental and surgical interventions with organisms from yeast and the nematode *C. Elegans* to mammals are typically undertaken in order to uncover the biological mechanisms that govern the operation of *our* bodies. And views of the history of life have been focussed on the final snapshot of the evolutionary past not only because of our greater epistemic access to it, but also because only the last 500 million years or so contains "interesting" developments, where these are defined in terms of innovations that lead steadily down the track to human beings.

Primatology is a beneficiary, perhaps even a legacy, of this partiality. A field of inquiry that has been practiced for just three-quarters of a century, its subject matter is characterized in terms of the Linnaean order, the primates, that includes *Homo sapiens*. Although Linnaeus himself included human beings in the primate order in the mid-eighteenth century, it was more than another 100 years before the resistance to this classification was overcome,

due in large part to the views of Darwin and Huxley. Huxley's influential 1863 essay, *Evidence as to Man's Place in Nature*, detailed the extensive anatomical similarities between us and non-human primates, leading Darwin to note, in chapter VI of *The Descent of Man*, that "[I]f man had not been his own classifier, he would never have thought of founding a separate order for his own reception".

Primatology itself had to wait another 50 years before it could begin down the path to disciplinization, a process that remains in flux, with most self-identified primatologists working either in departments of anthropology, psychology, or animal biology (or zoology) in major research universities. The small number of research centers dedicated to primatology, such as the Yerkes Primate Research Center at Emory University in Georgia (which derives from the Yale Laboratories of Primate Biology established by Robert Yerkes in 1929 with a substantial grant from the Rockefeller Foundation) tend to serve broader research communities, particularly university faculty appointed in one or the other of the above-named departments. The term "primatology" itself is only 60 years old, having been introduced by Theodore Ruch in his *Bibliographia Primatologia*, published in 1941. The work of Donna Haraway, particularly her monumental *Primate Visions: Gender, Race, and Nature in the World of Modern Science* (1989), but also a series of essays preceding that book, has brought the study of primates – its origins, social context, biases, and practitioners – to the attention of science watchers more generally. One of the books under review, Shirley Strum and Linda Fedigan's *Primate Encounters: Models of Science, Gender, and Society*, initiates a dialogue between these science watchers and primatologists themselves.

Primate Encounters is a collection of 24 essays that derive from a 1996 Wenner-Gren symposium held in Teresopolis, Brazil, organized by Strum and Fedigan, two prominent primatologists sensitive to the broader context of their field. About half the essays are written by primatologists, including a number of senior figures belonging to the academic generation that was instrumental in bringing primatology into the public eye in English-speaking countries in the 1960s. There are also essays by primatologists from Japan and Brazil, and a focus on the differences between primatology as it is practiced in the British, North American, Dutch, Japanese, and Brazilian traditions. The editors themselves provide an extended opening essay that offers a "situated North American perspective" on views of primate society, as well as three synoptic, concluding essays, and each of the book's organizing sections concludes with an edited e-mail exchange conducted between conference participants in the 18 months following the conference.

The remaining essays are divided equally between contributors who work primarily in or on disciplines that border primatology, such as archaeology and cultural anthropology, and those who self-identify as members of the science studies community. With the exception of Richard Byrne, a leading psychologist working on primate intelligence, and Donna Haraway, none of the eleven authors here have special research expertise on primates or primatology. The role of these essays is to provide a broader perspective on issues of gender and society as they arise within primatology.

Sarah Blaffer Hrdy's *Mother Nature: A History of Mothers, Infants, and Natural Selection* is a wide-ranging look at "Mother Nature" in three of its related senses: the way in which natural selection (aka "Mother Nature") has shaped human and non-human primate societies; the stereotype of women as passive, gentle, caring, and loving; and the actual nature of motherhood across the primate order, but particularly in humans. Hrdy was trained as a primatologist at roughly the same time as were Strum and Fedigan, and she is known for her unapologetic employment of the tools of early 1970s Harvard sociobiology in her theorizing about the nature of primate societies and the role of female reproductive choice within them. (Hrdy was a participant at the Teresopolis conference, but unfortunately her paper was one of two presented at the conference that did not make it into *Primate Encounters*.)

Hrdy's most controversial work was undertaken as part of her doctoral work in anthropology at Harvard in her study of the langurs at Mount Abu in southern India, in which she argued for a two-fold thesis: that infanticidal behavior in males who infiltrate a given langur troop was adaptational (i.e., had been naturally selected), and that the response of the infants' mothers, which was often simply to give up the infant and then (shortly thereafter) mate with the male who had killed it, was similarly of adaptive value. Yukimaru Sigiyama had reported this behavior in the mid to late 1960s, where news of it filtered down to Hrdy in an undergraduate course given by Irven De Vore at Harvard. Hrdy began her graduate fieldwork in India in 1971, and quickly came to reject the idea that this infanticidal behavior was pathological. One of Hrdy's long-lasting contributions to primatology was her emphasis on the role of *female reproductive strategies* in the process of evolution by natural selection within primate societies. *Mother Nature* provides, in passing, a personalized retrospective of Hrdy's study of primate infanticide, and the role it played in the development of the book:

> Studying infanticide in other primates turned out to be only the beginning of my quest to understand female nature and motherhood in particular. This quest lured me to do research in seven countries over thirty years,

> drawing on extremely unlikely sources of information – last wills and testaments, documents from foundling homes, folktales, even the pages of phone books – in my effort to learn about parental attitudes in my own species. Along the way, I have come to understand just how flexible parental emotions in humans can be. Whatever maternal *instincts* are, they are not automatic in the sense that most people use that term. Most important, I have learned that even though the world has undergone immense changes since our ancestors lived by foraging, many of the basic outlines of the dilemmas mothers confront remain remarkably constant (p. xvi).

This passage typifies the narrative elegance of *Mother Nature*, and signals a number of the themes that run through the book as a whole. I focus on three that are closely related.

The first is the *complexity* of Mother Nature (in all three senses). Hrdy clearly thinks that human mothers are evolutionarily prepared to be mothers – physiologically, psychologically, and socially – and to that extent there are maternal instincts, a nature to human mothering. But she resists the temptation to identify these with simple lists of qualities of the sort that appear as part of any stereotype of mothers. In particular, motherhood is not simply self-sacrificial, or patriarchally dominated, or socially constructed (despite its variation across human cultural contexts). Hrdy directly addresses the claim, rooted in the realization that not all mothers act "motherly", that motherhood is nothing but a social construction in her chapter "Unnatural Mothers" (see esp. 308–314), but, more generally, the biologically-grounded, evolutionary perspective that Hrdy develops throughout the book is clearly incompatible with this view.

The second theme is the central role of non-human primate and other animal studies in understanding human nature and features of human societies. Hrdy's focus throughout the book is on human mothers, to be sure, but in keeping with the most engaging sociobiological popularizations, facts and anecdotes about non-humans generously garnish *Mother Nature*. After an introductory chapter that raises the contested notion of human mothering, Hrdy's second chapter, "A New View of Mothers", almost exclusively discusses non-human mothers: from Jane Goodall's chimpanzee mother Flo, through David Lack's famous studies of clutch size in a range of bird species, Hrdy's own study of female choice in langurs, Randy Thornhill's work on symmetry preference in scorpions, the matricidal cannibalism of the Australian spider *Diaea ergandros*, to Jeanne Altmann's work on "dual-career mothers" in baboon troops. Several dozen other species of animals, chiefly mammals, make their appearance in this chapter, whose chief aim is to show how the key notions in sociobiological theory – parental investment,

sexual and genic selection, and individuals as fitness-maximizing strategizers – historically provided the bases for a liberating view of mothers. The consequent idea of female choice and a further elaboration of sociobiological basics, such as Hamilton's rule and kin selection, are introduced in much the same way in Chapter 3, "Underlying Mysteries of Development". This theme is particularly prevalent in all five chapters in Part One of the book, *Look to the Animals*, and plays a foundational role in Hrdy's overall argument.

The third theme, attended to at length in Part Two, *Mothers and Allomothers*, is how human female reproductive choice is constrained by both biology and social circumstance. Chapter 6, "The Milky Way", reviews the importance of lactation in shaping many of the characteristic social and behavioral features of mammals, and her striking speculation at the end of that chapter is that lactation may provide the key to understanding the evolution of social intelligence since "only among the followers of the milky way did that old opportunist Mother Nature get to try out different neuroendocrine combinations and select for the ones that promoted the *social relationships* most conducive to infant survival and to the mother's long-term reproductive success" (p. 145). Hrdy's revival of this version of women as the driving force of human evolutionary change draws on Keverne and colleagues' recent intriguing work with knockout mice that appears to show differential contributions of males and females to brain and brawn (Keverne et al. 1996).

Another crucial variable in Hrdy's equation of motherhood is the need for allomothering, and the resources within one's environment, including mates and kin, for providing it. The chapters in Part Two, the heart of the book, bring out much of the complexity surrounding mothering choices – from mate choice, to number and sex of offspring, infant abandonment, wet-nursing and daycare, infanticide, and postmenopausal mothering options – through a consideration of much cross-cultural and historical data about human societies.

As an original, large-scale work of advocacy, *Mother Nature* is successful both in undermining simplistic, traditional views of human mothering, and in showing how the tools of sociobiological theory can be adapted to feminist ends. But as even a casual read of *Primate Encounters* makes clear, Hrdy's brand of primatology and its appropriation within human sociobiology is simply one paradigm for doing primatology, and one viewed with some suspicion by many other primatologists and feminists. Given this, it is somewhat strange that Hrdy makes no attempt to defend the foundations of sociobiological feminism, or to respond to the many objections that have been leveled at it. Hrdy presents herself in *Mother Nature* as first and foremost a scientist, even if one with a human face, offering a broad, synthetic account of a crucial

aspect of human life. One gets the impression that, like many of the other primatologist participants at Teresopolis, Hrdy does not feel entirely engaged by many of the postmodern reflections that dominate science studies and the increasingly passé "science wars". In a book that is long by current academic standards, perhaps written reflection on her "situatedness", on the nature of primatology as a "site" for exploring human nature, or on woman as Other, would have been more than we all, author included, could bear. However, as I hope emerges in the remainder of this review, Hrdy's own advocacy could have been strengthened by attention to some foundational issues concerning the paradigm she champions.

If there is a fault to be found in the overall orientation of the deliberately wide-ranging *Primate Encounters*, it is that it commits just the opposite sin to *Mother Nature*: it contains much collective, self-reflective angst about primatology, including reflections on the reflections. To be fair to the contributors, this seems to have been part of the aim of the editors in encouraging primatologists to engage more directly with the primatology watchers. But in fact the level of engagement with primatology watchers in the essays by primatologists is fairly superficial, in part a function, perhaps, of the personalized, retrospective character of many of these contributions, which focus largely on time periods prior to the explorations of primatology by non-primatologists. The e-mail forums that punctuate the book compensate for this somewhat, and they certainly give one more of a sense of the personalities behind the papers. Readers will surely react differently to the content of these forums, and I hope that it will not seem too uncharitable to say that there was little here that I found informative about either primates or primatology. Apart from a few short, punchy quips by Thelma Rowell and most of Bruno Latour's ironic, fervent forays, the discussion in these electronic interludes were what one might expect from over-committed academics working in separate worlds dashing off an informal note in a breath of spare time. The medium, used in other publications that bill themselves in terms of the "science wars" (e.g., Editors of *Lingua Franca* 2000), in my view, sheds heat but little light.

One of the surprising (but I think related) features of *Primate Encounters* as a whole is how little explicit attention it directs at Haraway's work. The essays by science watchers Brian Noble and Gregg Mitman that focus, respectively, on the public reception of the work of Goodall and Fossey and on the relationship between the representations of primates in primatology and popular culture do draw explicitly on Haraway's work, chiefly on her portrayal of the interplay between primatology and the public arena. But the only acknowledgment of Haraway's *Primate Visions* amongst primatologist

contributors is a passing mention in Alison Jolly's wry essay, "The Bad Old Days of Primatology?". For the most part, the contributions of primatologists in chapters 2 through 10 offer, as I have noted, personalized and selective retrospectives of some slice of the history of primatology (chiefly the 1960s) or cultural context (Britain, North America, Japan, Brazil), and are delivered in a fairly straightforward reportage style, with little theoretical embellishment or sophistication. For this reason it is a shame that the editors themselves chose to construct their otherwise laudable introductory contribution primarily with an eye to painting a broad-brushed view of the last 50 years of primatology, rather than giving the specifics of what primatologists and primatology watchers have to learn from one another. Some of this, in general form, can be found in the synoptic, closing essays that the editors provide, but the volume as a whole suggested to me how great the distance is between those who look at primates, and those who look at those looking at primates.

Haraway's own contribution to *Primate Encounters*, "Morphing in the Order: Flexible Strategies, Feminist Science Studies, and Primate Revisions", is one of the true treasures of the collection. It is in part an attempt to explain and revise the themes of several chapters of *Primate Visions* (ch. 4 on Yerkes and the Yale Laboratory project, and ch. 7, a more encompassing chapter that gravitates around the public presentations of apes and ape life, especially through the National Geographic specials). It is also in part a brief re-exploration of Wrangham's sociobiological excursions into chimpanzee ecology, and in part a personalized situating of Haraway's own fascination with primates and primatology. Haraway's eye is cast to past and present, and the sharpness of her perception (and wit) is reflected in both cases. In rounding out her discussion, Haraway draws attention to a recent, high-profile publication in primatology, presenting it the reader with paradigms in the field and her own work in mind. She notes:

> The chimpanzees of Gombe structure my program for "Morphing in the Order". And so, appropriately, on the front cover of *Science* magazine for August 8, 1997, a touching portrait of old Flo's adult daughter Fifi (now thirty-eight years old with seven surviving children of her own) and baby grandson Fred highlights updated accounts for my primate revisions. Several threads come together. The lineage of Gombe workers reproduces itself, even as the scientists focus on the differential reproductive success of the chimpanzees. A graduate student at the University of Minnesota (Jennifer Williams) publishes with her senior mentor Anne Pusey, from the generation of sociobiologically influenced researchers that followed and in many ways challenged Jane Goodall, who is the third author of the 1997 *Science* article (Pusey et al. 1997) (p. 415).

It is with respect to such threads that Haraway is a celebrated weaver, making her work a rich source for further reflection on primatology and Mother Nature. It is, however, a shorter, preceding quotation from the paper that I want to use as a springboard for returning to the gynocentric sociobiology of Hrdy's *Mother Nature*: "In sociobiological narrative, the female becomes the calculating, maximizing machine that males had long been" (*loc.cit.*).

It is part of the folklore operating in the history of recent evolutionary biology that William Hamilton's brilliant papers on the evolution of social behavior (1964) and George Williams's *Adaptation and Natural Selection* (1966) between them awoke evolutionary biologists from the dogmatic slumber of group selectionist thinking. The idea that a trait could evolve "for the good of the species" or some smaller such group was usurped by adaptationist explanations cast in terms of benefits conferred on fitness-maximizing individuals and/or their selfish genes. Behaviors, including social behaviors, and psychological traits (especially desires and emotions) evolved as the result of, and themselves became, *rational strategies* for organismic and genic reproductive maximization. Kin selection – the process generating preferential treatment of kin in proportion to their relatedness to a given individual – and reciprocal altruism – undergoing reproductive cost in order to benefit those who reciprocate or are likely to do so – became, throughout the 1970s, two paradigmatic ways to invoke such rational strategies in explaining the evolution of pro-social behaviors and traits within sociobiological theory.

The general parallels between this turn in biology and the triumph of liberal individualism over mushy, holistic "Hegelian" thinking in political theory have often been noted, and it is surely no coincidence that the renaissance of liberal political theory within North America in the early 1970s was heralded (indeed, caused) by the publication of two "competing" books by Harvard colleagues, John Rawls (1971) and Robert Nozick (1974). In evolutionary biology, sociobiology made individual agents the focus of explanatory action, construing the value of their decisions in terms of genic reproductive success. In recent political theory, liberalism brought individual agents to the fore in the justificatory projects at the heart of the field – of large-scale social and institutional organizations, and of particular political and economic policies – imposing value on those that maximized individual-level goods, such as freedom, autonomy, and personal income. Game theory became the most widely used framework for understanding evolutionary dynamics, idealized as a matrix for two competing strategies (such as "hawk" and "dove"), just as rational choice theory played that role within political liberalism.

Part of the power of both perspectives, I think, lies in the mundane fact that individuals are sort of *obvious*: they are easy to observe as parts of the biological and political worlds, and their ontological status as biological or political units would seem to be entirely unproblematic, particularly in contrast to "higher level" entities. They simply *are*. But I think that a more subtle characteristic of individuals contributes to the appeal of both views, and from here I shall focus exclusively on the biological realm to bring us back, eventually, to primatology.

Individuals have *psychological* characteristics, and we ordinarily take much of their behavior to be explained by an appeal to underlying mental states. "Folk psychology" is a term used of both the set of mental states – most barely, beliefs and desires, but more fully also emotions, sensations, intentions, and personality traits – and the explanatory framework that invokes such states. Much of cognitive, personality, and social psychology, are elaborations of folk psychology. Its folkish (i.e., untutored and common) nature makes it the kind of "theory" that seems ontologically minimalist to many; its postulates are at least the kinds of states that we know to exist from our own first-person cases. "Strategies" and "interests" are, I want to suggest, terms in sociobiological theory that gain our trust in part through their place in our folk psychology, so that "reproductive strategy" and "genetic interests", although *not themselves* terms for psychological states benefit from the relationship to such terms. This is not unlike the way in which key notions in Freud's psychoanalytic theory, such as "unconscious belief" or "sublimated desire", gained their intuitive purchase on our minds through their analogy to *conscious* mental states, however distinct they are from such states.

This is an instance of what I call the *cognitive metaphor*, and it seems to me to play a particularly key role in primatology and human sociobiology. Genes are *selfish*, *strategies* evolve to maximize an individual's genetic *interest*, and reproductive *investments* represent *trade offs* between competing constraints. While the appropriation of each of the italicized terms from economics and economic theory *has* been widely recognized, their appropriation from psychology has not. The sociobiological conception of individuals *as if* they were rational agents bubbling with folk psychological states that play a central role in directing their behavior is, of course, compatible with the non-existence of such states. Each of the key concepts with sociobiology has a non-psychological definition or characterization – which is what underlies the merely "as if" quality to the appeal to psychological agency – yet this hardly explains why *those terms* were appropriated or adapted in the first place.

As in human sociobiology, in primatology the distance between the "as if" psychological invocations and underlying genetic reality, as construed within

sociobiology, is harder to maintain than in many areas in which the cognitive metaphor operates. This is because in creatures that can be considered serious candidates for having a folk psychology (however rudimentary or sophisticated), there is the permanent possibility that "as if" *is* the reality. One of the topics taken up by several contributors to *Primate Encounters* – Alison Jolly, as well as Richard Byrne in his "Changing Views of Imitation in Primates" – is the role of the cognitive revolution in allowing primatologists to speak more directly about the apparent psychological lives of non-human primates. This mentalism is subject to the charge of anthropomorphism, as is the discussion of primate social structure that was opened up by the influence of ethology. As Pamela Asquith points out (in her "Negotiating Science: Internationalization and Japanese Primatology"), Japanese primatology has frequently been charged with this sort of anthropomorphism (cf. Thelma Rowell's "A Few Peculiar Primates" on the reception of her studies of the social structure of sheep). The very same fact that takes the sting out of these concerns about anthropomorphism in primatology – namely, our phylogenetic affinity with other primates, especially the African Apes (bonobos, chimpanzees, and gorillas) – also makes the recognition of the *metaphoric* nature of the attribution of psychological states in sociobiological explanations more difficult. (For a discussion of the evolution of fatherhood that shows no qualms about anthropomorphic extravagance, see Masson 1999.)

While several contributors to *Primate Encounters* express their reservations about sociobiologically-orientated primatology (see especially Robert Sussman's pointed "Piltdown Man, the Father of American Field Primatology", which in part critically reviews Hrdy's langur work), none of them challenge its underlying assumption of individualism about the unit of selection. This is surprising in light of the influence of the recent work of David Sloan Wilson and Elliott Sober on group selection (e.g., Wilson and Sober 1994; Sober and Wilson 1998), which has offered a spirited revival of group selection and a reinterpretation of the standard history of the fall of group selection at the hands of Williams and Hamilton. My own view is that group selection warrants special consideration when we strive to understand the interplay between group-level traits, such as social structure, and individual-level traits, such as intelligence, since the former certainly can evolve through group selection. If intelligence is what I elsewhere (Wilson 2001) call a *socially manifested* trait of individuals, such that individuals can possess it only in groups with certain social structures, then group selection itself may play a more direct role in the evolution of intelligence than has been thus far assumed.

One thing that struck me in reading not only this pair of books but other recent books in the same general area (e.g., Morbeck et al. 1997; Jolly

1999; Gowaty 1997) was the lack of attention in the field to this revival of group selection. When mentioned at all, group selection was a bogeyman to avoid, a naïve, feelgood view of how natural selection works. However one views the history of the shift from group to individual and genic selection in the late 1960s and early 1970s in much evolutionary thinking, the work of David Sloan Wilson, Michael Wade, and others over the last 25 years make this a complacent, indeed ignorant view to adopt of current group selection models. Groups as small and ephemeral as temporary dyads and as large and permanent as demes or even whole species or clades have been integrated into the mathematical models that depict the intergenerational evolutionary changes in trait distributions, and this new group selection has returned as a serious option within debate over the units of selection as the standard objections to group selection have been addressed along with those models. Taking group selection seriously within primatology and the human sciences requires taking groups and their properties as fundamental units, something at odds with the various biases that make individuals the obvious subject of choice in those fields. But it would provide one way to break out of some of the binary traps into which both fields have often fallen (e.g., the succession of "man the hunter" by "woman the gatherer" models of humanoid evolution), one that might be especially revealing for understanding essentially *social* creatures.

I have already indicated some of the structure to *Mother Nature* in pointing to the general role of sociobiological theory in Part One and of female choice in Part Two. Rounding out the book is Hrdy's discussion of *infant* choice in Part Three, *An Infant's-Eye View*, to my mind the most interesting and provocative ten chapters in the book. Since babies and infants must procure the continued assistance of a care provider if they are to survive, the "strategies" that they adopt in order to maximize the chance that they will survive to adulthood are directed at this goal, including their cute, chubby looks (ch. 21, "A Matter of Fat") and the psychological warfare conducted through crying from separation anxiety (ch. 17, "Secure from What?" or "Secure from Whom?") and tantrums (ch. 18, "Empowering the Embryo"). Hrdy treats John Bowlby's theories of attachment sympathetically throughout, and ch. 22, "Of Human Bondage" presents a convincing defense of Bowlby against some of his harsher feminist critics. Despite her own optimism about the likely significance of integrating the psychoanalytically-based theories of Bowlby within the framework of sociobiology (ch. 23 "Alternate Paths of Development"), there are two related features of the chapters in this part of the book that should make one more circumspect.

The first of these comes through most explicitly in Hrdy's explanation of why it is especially important for infant attributes to be appealing to potential human care providers:

> For unlike other primates, humans have a conscious capacity to assess outcomes – to predict what costs a particular infant might impose on the survival of an older sibling, or on family resources or harmony; to predict how a father or stepfather might behave; to know ahead of time that the baby's grandmother is about to die and that there will be no one to help; in short, to mentally run through a store of information concerning what has happened in the past to other infants born with this particular configuration of traits and circumstances and to make a *conscious* prognosis for this one (p. 454).

This point is familiar to us all; indeed, it is one of the things that makes some of the extreme forms that parental choice take, such as infanticide or abandonment, seem *evil*: they seem to be, or just may be, the result of conscious, calculated human choice. Part of the point of Parts One and Two of *Mother Nature*, recall, is to reveal the evolutionary logic that generates such behavioral outcomes, especially in non-human species, without the need to posit conscious mental states that would warrant this judgment about them.

Conscious deliberation on the part of parents is a psychological feature novel with us, or with those species that are our closest relatives, and it surely modifies how we view our "look to the animals" for clues about ourselves. Hrdy's view, clearly, is that it requires only a slight modification in the sociobiological paradigm, and, more generally, that the relationship between that paradigm and any data or theory concerning conscious human choice in matters infantile is one of subsumption. But conscious choice also interacts with a host of other variables concerning parenting in general and mothering in particular, including alloparenting options, the timing of birthing, and the use of breast-feeding. Hrdy tends to view human mothers simply as having different ways to manifest their genetic interests, and takes less seriously the possibility that consciousness, and with it, the sorts of *cultural innovations* with which it is coupled, have introduced a way to circumvent, override, or ignore those interests. For example, rather than construing the existence of non-kin, paid alloparents (e.g., nannies and daycare workers) as an "evolutionary novelty" (p. 506), it might be more appropriate to view this *social* experiment as offering a cultural innovation that restricts the long reach of the gene.

The second point emerging in Hrdy's own discussion that suggests more limitations to her overarching framework than she recognizes is the idea that "there is no one species-typical, one-size-fits-all pattern of development" (p. 514), a point that Hrdy makes with respect to Bowlby's views.

In place of one-size-fits-all are various "developmental trajectories" (p. 522). Intraspecific variation, and intracultural variety in human beings in particular, has been a traditional bugbear for evolutionary explanations of the presence of a given trait. Evolutionary psychologists, such as John Tooby and Leda Cosmides (1992), have taken on the supposed tension between human cultural variation and evolution as a part of their attack on the "strong social science model" of culture. An important distinction they make in doing so is between cultural variation in *behavior* and the commonality of underlying psychological *mechanisms*. Yet the developmental trajectories that Hrdy appeals to are not simply different patterns in behavioral outcomes, but different *ways* in which children can develop so as to ensure their survival. Here we have something like differences in the underlying mechanisms themselves.

While Hrdy is sensitive to the issue of variation in developmental trajectories, since she doesn't seriously consider the ways in which actual psychological strategizing can counteract natural selection and the "as if" strategizing used in characterizing its operation, I think that she underestimates the extent of this variation and the challenge it poses to her views. Hrdy considers alternative ways in which individual children can maximize their fitness, appealing, briefly, to Mary Main's work on gaze avoidance in infants and Frank Sulloway's views of birth order and personality type (pp. 522–524). But the way forward here is murky, not least of all because the state of the fields to which Hrdy perhaps views evolutionary theory as bridging – personality psychology, social pathology, non-cognitive developmental psychology – is, to put it charitably, underdeveloped. When evolutionary theory meets psychological theory that probes little further than pop psychology, problems loom. This is a problem shared with the grander synthetic visions proposed by sociobiologists and evolutionary psychologists – I have in mind particularly the work of E.O. Wilson, and much of Steve Pinker's *How the Mind Works* (1997).

It is precisely this sort of point that one might expect to find made by the science watchers casting their gaze to primatology in *Primate Encounters*. However, apart from the contribution of Haraway that I have already discussed, there is little constructive, critical work of this sort to be found in this part of *Primate Encounters*. As mentioned, the essays by Noble and Mitman focus on the public images generated by primatology, and raise some general questions about culture, nature, and society. Evelyn Fox Keller's "Women, Gender, and Science: Some Parallels between Primatology and Developmental Biology" is chiefly about developmental biology, and as such

could perhaps have better been located with the papers that consider work on gender and society in related disciplines. Charis Cussins's "Primate Suspect: Some Varieties of Science Studies" was added to the volume in order to provide a general overview of science studies, and as such it says little about primatology in particular. While Cussins registers the tension between naturalistic philosophers of science and science watchers, she fails to note that many such philosophers probably do not view themselves as part of the science studies community at all, creating the misleading impression that post-positivist philosophy of science in general is fully subsumed under the umbrella of science studies. Bruno Latour's "A Well-Articulated Primatology: Reflections of a Fellow-Traveler" adapts several of Latour's provocative ideas about the structure of the "flows of knowledge" in science and the ways in which optical, trail, and propositional metaphors for scientific representation and activity influence how science is studied and practiced. Latour's essay shows more engagement with the papers and issues of the conference than any other in the collection (he comments on the papers of at least six of his co-participants), and seems to do more towards bridging between primatology and primatology watchers than any other contribution to the volume.

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