

MILK TO MENOPAUSE: A TALE OF FEMALES AT THE FOREFRONT OF EVOLUTION

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A review of the book

Eve: How the Female Body Drove 200 Million Years of Human Evolution

By Cat Bohannon, 2023.

Hutchinson Heinemann. UK. 624 pages.

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Two hundred million years ago, on a hot, humid Jurassic night, the world's earliest mammals crawled about. Here, Cat Bohannon, cognitive psychologist turned science writer, begins her narrative of human evolution. Why start the story with mammals? Because the defining characteristic of those first mammals—milk production—made possible critical later adaptations that led to humankind. Notably, lactation appeared only in females. Producing milk allowed the first mammalian mothers to hydrate and nourish their offspring. Increased maternal investment set placental mammals on a path to invest further via internal gestation. Lactation and gestation are integral not only to the biology of mothers but also to the development of all members of the species with these adaptations. So why, Bohannon criticizes, has so much of modern scientific practice ignored or even excluded females? Citing the practice of conducting medical studies with only male subjects, human and animal alike, Bohannon demonstrates how sexism persists in biological knowledge production. In *Eve*, Bohannon responds to the lack of consideration of females in studies of human biology with a history of human evolution that emphasizes the roles of females. Beginning with lactation, she focuses on major adaptations that evolved in females or that differ between the sexes. *Eve* even poses female-driven hypotheses for the origins of such key human traits as bipedality and spoken languages. Accented by colorful anecdotes and peppered with fun facts, Bohannon

invites readers to consider how the evolution of ancient females (and males) shaped human bodies, behaviors, and societies today.

Eve gets its name from notable figures that guide the narrative. Moving chronologically through major transitions, Bohannon attempts to identify an “Eve” for each chapter. These Eves are species or taxa representing the first females to possess a given trait or new expression of an old trait. Bohannon names Eves for “Milk” (mammals), the “Womb” (placental mammals), “Perception” (primates), “Legs” (hominins), “Tools” (*Homo habilis*), the “Brain” (*Homo erectus*), the “Voice” (*Homo sapiens*), and “Menopause” (*Homo sapiens*). The book concludes with a chapter on “Love”, for which Bohannon does not identify an Eve. She instead turns to the present day and future, reflecting on how knowledge of our evolutionary past can shed light on present-day sexism and help us “overcome our less desirable behaviors” (p. 436).

Through these metaphorical Eves, the chapters tell an overarching story of females at the forefront of major evolutionary adaptations. *Morganucodon*, the Eve of milk, changed how young mammals survive. *Purgatorius*, the Eve of primates, saw and heard the world differently. Each chapter opens with a brief narrative showcasing the life of an Eve or Bohannon’s personal experiences before delving into discussions of hypotheses, scientific findings, and relevant implications for readers’ lives. Explanations are punctuated with witty asides and fresh facts that may be new even to familiar readers. I, for one, learned of the exciting findings on how pregnancy can induce neural restructuring in the maternal brain (Hoekzema et al., 2017). In less seriousness, I was also tickled to learn that female tenrecs can have up to 29 nipples. The diversity of information reveals Bohannon’s passion for the topic and the breadth of her research into female animals and human biology. She especially provides female readers with an opportunity to see themselves and their experiences in the grand story of human evolution. Bohannon also demonstrates compassion for the well-being of other females. She includes reliable information on health problems common in women without trying to invoke immediate fear of health concerns. For example, the introduction remarks on a need for greater research attention to the effects of liposuction on fat mobilization for breastfeeding, but Bohannon is clear that properly performed liposuction is not considered dangerous.

Perhaps the most intriguing features of *Eve* are Bohannon’s arguments for female-driven selection for some of humanity’s most iconic characteristics. Whereas some chapters (such as “Perception” and “Brain”) assess sex differences in adaptations that benefit both sexes differently, other chapters make cases for adaptations that would have benefited females first. In “Legs,” Bohannon makes the case that females, more than males, would have benefited from the ability to take long walks across the savannah while carrying food and an infant away from hungry competitors. “Tools” focuses on the rise of a repertoire of gynecological tools and knowledge such as medicinal plant use and birth assistance. Bohannon argues that gynecological methods would have been necessary to facilitate the explosion of population size and geographical range in *Homo erectus* despite rising obstetric complications. In “Voice,” Bohannon argues that the earliest demands for language, particularly storytelling, would have been between a mother and her child. Some of these arguments reflect Bohannon’s original ideas while others build on existing ideas such as Wenda Trevathan’s claim that early hominins would have needed assisted birth (Trevathan, 1996).

Bohannon presents traditional hypotheses alongside the female-driven hypotheses, but in some cases, the female-driven hypotheses are weaker than others. For example, I question the likelihood that early female hominins would have walked more distance than males given that, among modern human foragers, it is typical for men to cover more distance each day than women (Wood et al., 2021). Nonetheless, Bohannon’s arguments are an essential exercise in questioning explanations that fail to consider the roles of females. Similarly, the origins of spoken language remain an essential question in human evolution. Bohannon’s point that children learn languages from their caregivers is a compelling reason to consider that language

first flourished not between members of hunting parties, as Bohannon notes some scholars hypothesize, but between adults and children. Regardless of whether readers are convinced by Bohannon's arguments, *Eve* presents serious hypotheses that demand further consideration.

Unfortunately, the writing style of *Eve* obfuscates which ideas are Bohannon's and which have been developed by other scholars. This is especially true of the female-driven hypotheses for bipedality and language. While Bohannon provides ample citations in the bibliography and some clarifications in the notes, the body of the text largely lacks references to how scientific knowledge and theory are produced. This writing choice maintains the book's narrative atmosphere but serves as a deficit in science communication. Scientists become invisible to the reader.

Furthermore, aspects of *Eve* may feel discordant to some readers. The tone is often varied within chapters. Vivid imagined depictions of ancient scenarios clash against humorous insertions and medical descriptions, particularly in the early chapters. Additionally, some readers may find the central extended metaphor of Eves to be misplaced in a book on evolution. However, I appreciate the initial framing of "Eves" in their "Edens" to discuss important females adapted to their environments although the metaphor may become over-extended. Referring to an Eve's environment as its Eden paints a useful picture of an origin story, but that story becomes less clear when a later ancestor's environment is its "Bethlehem."

Despite these concerns, Bohannon's book is successful in its narrative perspective of human evolution. As a PhD student in biological anthropology and researcher in the evolution of human behavior, I enjoyed *Eve's* challenge to many predominant hypotheses about human evolution. Even where I was not fully convinced by Bohannon's arguments for a primarily female-driven explanation of the origins of a given adaptation, I welcomed her evaluation of different hypotheses and critique of hypotheses that overlook the role of females. As a young woman, I admire the author's dedication to informing female readers of our evolutionary history's impacts on modern health and social conditions. Bohannon certainly achieves what she set out to do: emphasize the critical role of females in human evolution and challenge models that overlook women and females.

Eve will find its place in the hands of readers looking for a leisurely stroll through a female perspective on human origins. Though some passages primarily address female readers, interested readers of all genders can learn new perspectives on the transitions that shaped humanity. Scholars and casual readers outside of biological sciences will find that *Eve* is an accessible entry point to evolutionary perspectives of human biology and society. For academic readers, *Eve* provides an opportunity to engage with alternative explanations that consider a female perspective. In classrooms, sections from *Eve* may be especially useful for aiding students to picture the environments in which different adaptations evolved and how those adaptations function in modern humans.

ABOUT THE AUTHOR

Brooke Rothamer is a Ph.D. student in biological anthropology and a member of the Human Systems and Behavior Lab at Boston University. Her research investigates the patterning of social organization across child development through evolved behavioral motivations and social influences.

REFERENCES

- Hoekzema, E., Barba-Müller, E., Pozzobon, C., Picado, M., Lucco, F., García-García, D., Soliva, J. C., Tobeña, A., Desco, M., & Crone, E. A. (2017). Pregnancy leads to long-lasting changes in human brain structure. *Nature Neuroscience*, 20(2), 287–296. <https://doi.org/10.1038/nn.4458>
- Trevathan, W. R. (1996). The evolution of bipedalism and assisted birth. *Medical Anthropology Quarterly*, 10(2), 287–290. <https://doi.org/10.1525/maq.1996.10.2.02a00100>
- Wood, B. M., Harris, J. A., Raichlen, D. A., Pontzer, H., Sayre, K., Sancilio, A., Berbesque, C., Crittenden, A. N., Mabulla, A., McElreath, R., Cashdan, E., & Jones, J. H. (2021). Gendered movement ecology and landscape use in Hadza hunter-gatherers. *Nature Human Behaviour*, 5(4), 436–446. <https://doi.org/10.1038/s41562-020-01002-7>