

**The Evolution of Human Life History.** *Kristen Hawkes and Richard R. Paine, eds.* Santa Fe, NM: School of American Research Press, 2006, 505 pp. \$34.95, paper.

Humans live long lives, wean early, grow slowly, and support big brains. These are key species-typical traits that were the subject of a School of American Research seminar entitled "The Evolution of Human Life History" in November 2002 at Santa Fe, NM. Organized by Kristen Hawkes and Richard Paine (the editors), the meeting's goals were to identify distinctive human life history traits, debate current theoretical models, and evaluate the available evidence. To achieve these goals, sixteen biological anthropologists offered state-of-the-art reviews, and this book is the outcome of their endeavors. The time is ripe for this book, bringing together perspectives from evolutionary biology, behavioral ecology, primatology, growth and nutrition, paleodemography, and osteology all in one volume. The scope is broad enough to be of widespread appeal for any interested in the timing and duration of life stages in primates and hominins, and the selective pressures that have led to the unique features of *Homo sapiens*; these themes are the bread and butter of human life history theory.

After an introductory synopsis by the editors, Hawkes presents several chapters summarizing Eric Charnov's influential dimensionless invariant approach to analyzing life history variation across mammals, and exploring the extent to which primates and humans vary from the typical mammalian patterns. She pays homage to the history of ideas by describing theoretical precursors such as MacArthur and Wilson's somewhat obsolete notion of *r* vs. *K* selection, and Stephen Jay Gould's perspectives on ontogeny. Two chapters focus on the role of brains, a usual prime suspect in the miry web of cause and effect relating to human uniqueness (although of course the life history of each species is unique). Van Schaik and colleagues provide a careful, up-to-date review and analysis of different theories about brain size evolution among primates, while Robson and colleagues unexpectedly argue that chimpanzees and humans show similar patterns of brain growth.

Sellen emphasizes the role of complementary feeding for facilitating early weaning in humans and discusses the scheduling, duration, and physiology of lactation. As a primary means of resource transfer between parents and offspring that is common to all mammals, the topic is critical for understanding variation in diet, body growth, brain size, fertility, and child mortality. Sellen does a thorough job of highlighting these relationships. Bogin presents an argument and evidence for the novel inserted life stage of childhood and discusses functional (but favors non-functional) explanations for delayed maturation. Blurton Jones summarizes previous work on mortality, the development of foraging skills, and grandparental residence patterns among Hadza hunter-gatherers; a final part (unconvincingly) argues that Charnov's model can account for the variation in Hadza growth patterns. However, his admonition that "we need more adaptationist thinking about hunter-gatherer growth" before making conclusions about the reasons for slow juvenile growth is an understatement.

Regarding patterns of human mortality over broad swaths of time, Paine considers the relevance of Holocene farmers and medieval European history.

Based on computer simulations, he shows the interesting result that with a greater frequency of infectious epidemics, older adult survivors may show improvements in life expectancy whereas child mortality remains high. Konigsberg and Herrmann summarize recent methods using the auricular surface of the sacroiliac joint and maximum likelihood statistics to obtain ages for skeletons, and they perform a much-needed revision of classic paleodemographic lifetables. Several now show similar mortality patterns to those from extant hunter-gatherers. For those of us who have argued over the years that previous paleo-lifetables could not possibly represent past human populations, this is a reassuring development. The final chapter by Skinner and Wood is the authoritative (and amusingly opinionated) treatment of what can or cannot be said about the existence of different traits throughout our evolutionary past based on the fossil record.

Given the oft-repeated recognition that the "two models [that] currently dominate the literature on the evolution of human life history evolution" are the Embodied Capital hypothesis and the Grandmother hypothesis (Ch. 10, p. 309), it was disappointing and a disservice to readers that there were no critiques of the Grandmother hypothesis, nor contributions from any proponents of the former model (several of whom were ironically resident just a stone's throw away from the SAR meeting at the University of New Mexico), nor of Ron Lee's model that also emphasizes intergenerational transfers. Hawkes' Grandmother hypothesis, and its corollary views concerning the unreliability of hunting as a subsistence strategy and the ease of foraging skill acquisition, need to be balanced by a perspective that focuses on the sexual division of labor and food sharing in the evolution of the human life course.

My only other lament is that a detailed treatment of physiological adaptations, such as those that might support longevity, is missing from the volume; however, this application of life history theory to the biomedical field will surely be a future emphasis, with recent work in ecological immunity, epigenetics, and biogerontology making substantial contributions. To borrow a phrase from the last sentence in the last chapter, "the task . . . to document and help understand that complexity has only just begun."

Overall the accessible style, nice mix of theory and evidence, and uniform focus make this book a suitable introduction for upper-division undergraduates and for new graduate students. There are enough gems and useful references to fuel eager students skipping down the bumpy but merry path towards one (or even ten) PhD dissertations.

Michael Gurven  
University of California–Santa Barbara