of primates, but no beautiful pictures of baby primates, grooming primates, or colorful golden lion tamarins. Rather, as the typography on the cover makes clear, the focus of this book is *Homo sapiens*, and how we came to be the way we are over the course of primate and human evolution. The behavior of nonhuman primates certainly fills most of the pages, but the clear focus of the book, from beginning to end, is not about the diversity of behavior seen in the Order Primates, but how the roots of human behavior can be identified and understood by a comparative, rigorous analysis of similar behaviors of our closest relatives in the context of natural selection.

As a textbook in the Foundations of Human Biology series, the volume starts with very strong theoretical chapters on evolutionary theory and behavioral biology that address basic topics such as natural selection, fitness, adaptation, proximate and ultimate causes, development, social learning, and behavioral phylogeny as well as the all-important human characteristic of culture and its evolution. Following this background, and a brief summary of human evolution, subsequent sections address major aspects of (primate and) human biology, including subsistence and technology, sex and sexual selection, mating, life history, parenting, growth and development, cooperation, warfare, morality, religion, cognition, and language.

For over a half-century, primatologists have been trying to convince anthropologists that they have something to offer the study of human behavior. This book fulfills that promise and shows that anthropology is, indeed, a subfield of primatology. It is the anthropological justification for the past five decades, and the roadmap for the future of primate behavioral ecology. Anyone interested in primate and/or human evolution would learn a lot from this book. I suspect it would be rough going for most undergraduates, but graduate students would find enough in here to inspire a career.

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DISPERSING PRIMATE FEMALES: LIFE HISTORY AND SOCIAL STRATEGIES IN MALE-PHILOPATRIC SPECIES. *Primatology Monographs.*

Edited by Takeshi Furuichi, Juichi Yamagiwa, and Filippo Aureli. Tokyo (Japan) and New York: Springer. $159.00. xii + 299 p.; ill.; index. ISBN: 978-4-431-55479-0 (hc); 978-4-431-55480-6 (eb). 2015.

"Should I stay or should I go" is a decision of individuals, which at the species level can lead to different outcomes. Although in mammals males often disperse, female dispersal is common among primates and males can stay "at home." Humans are considered one of these male philopatric species. Comparative research with primates exhibiting similar dispersal patterns may enlighten us with the evolutionary history and social consequences of this dispersal pattern. However, females are the "difficult sex," since following the fate of long-lived dispersing females is challenging. This book reviews current knowledge of primate species with female dispersal and male philopatry, including the human primate, rendering it interesting for primatologists, comparative psychologists, and anthropologists.

The dispersal patterns of primates are explored, and show that depending on the species only males, only females, or both sexes may disperse (Chapter 9). Female dispersal combined with male philopatry is found in several primate species, but is most prevalent in two taxa: African apes and South American atelines. The book focuses on these two primate taxa. As presumed, dispersal in muriquis (Chapter 1) and bonobos (Chapter 6) concerns young females that leave their natal group combined with male philopatry. A similar pattern has been documented for chimpanzees in the literature (Chapter 5), is also present in the studied woolly monkey population (Chapter 3), and is likely in spider monkeys (Chapter 2). Gorillas are an exception, with dispersal of both sexes and not only dispersal of young females, but also secondary dispersal of older females (Chapter 4). Surprisingly, both studies on humans, contemporary Central African (Chapter 7) and Kalahari hunter-gatherers (Chapter 8), argue that they are "bilocal," implying dispersal of both females and males. Divorce may result in secondary female dispersal. These studies suggest that human patrilocal agricultural societies are derived.

Female dispersal leads to coresidency with unrelated females. Female social relationships may depend on season or reproductive status (spider monkeys, Chapter 2), with a preference to associate a male (woolly monkeys, Chapter 3) and ecology and social conditions may overrule species differences (chimpanzees and bonobos, Chapters 5 and 6). Unfortunately, the causes of this intriguing diversity between species cannot be pinpointed to specific causes, due to a lack of comparative data.

This book gives its best, but also indicates that we still lack of systematic comparative data on the "difficult sex." Only long-term study following of these species can enlighten us on causes of variation in dispersal patterns and its social consequences. Unfortunately, many of these species are threatened and their extinction will not only wipe out their lives, but also potential insight in our own evolutionary history. Moreover, the human studies surprisingly indicate dispersal of both females and males, resembling gorillas and some other primates. This invites comparison of human dispersal

patterns with "bilocal" primates, a new avenue to explore the consequences of female dispersal.

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Governing Behavior: How Nerve Cell Dictatorships and Democracies Control Everything We Do.

By Ari Berkowitz. Cambridge (Massachusetts): Harvard University Press. $29.95. ix + 227 p. + 8 pl.; ill.; index. ISBN: 978-0-674-73690-0. 2016.

In 1967, Kenneth D. Roeder's book *Nerve Cells and Insect Behavior* (Cambridge (MA): Harvard University Press) was published and the incipient field of neuroethology was a direct beneficiary. Fast forward 50 years and Ari Berkowitz provides an updated and enhanced contribution that may, like Roeder's work, serve as a standard for years to come. Highlighting the importance of species specific adaptation, Berkowitz states: "Every animal has a nervous system that controls its behavior . . . other species have particular technical advantages" (p. 8). The Danish Nobel Laureate, August Krogh, put this general idea forward in 1929, writing, "For a large number of problems there will be some animal of choice or a few animals on which it can be most conveniently studied" (*American Journal of Physiology* 90:248). Now known as Krogh's Principle, relevant examples have been accumulated from a fantastic assemblage of fauna (cockroaches, flies, fish, turtles, owls, bats, rats, ferrets, cats, crayfish, monkeys, and zebra finches) and Berkowitz incorporates numerous cases from this menagerie into his story.

Employing a clever framework, Berkowitz describes how the nervous system controls behavior by drawing analogies to the ways human governments manage countries. The book focuses on the importance of monitoring action potentials or "spikes" within the neural circuits of living animals to determine the causes of behavior, with approaches providing indirect links to the biological basis of behavior being only briefly discussed. Aside from limited cases in human patients, nonhuman animals are the primary focus throughout the text.

The author next tackles the question of whether behaviors are controlled via dictatorships or democracies. He first evaluates evidence for behavioral outputs governed by single "command" neurons, comparable to dictatorships. Classic examples are provided, such as the lateral giant neuron in producing escape tail flip responses in crayfish. In most cases, Berkowitz argues that neural circuits operate more like democracies through population coding. Next, the complexity underlying rhythmic behaviors such as walking and breathing is covered, drawing on the understanding that specialized and multifunctional neurons work together and interactions between central commands and local feedbacks can be altered through neuromodulators. The sequential coverage is illuminated through an engaging discussion of the history and people behind these major developments and discoveries.

The ensuing chapters focus on the diversity and complexity of external sensing, what Berkowitz refers to as government surveillance. Classic works are detailed on the extraordinary precision achieved by the sensory neuronal circuits of the barn owl and star-nosed mole, as well the "covert" capacities of echolocation in the mustached bat and the jamming avoidance response of weakly electric fish. Descriptions of self-monitoring situations and how the features of nervous systems avoid interference between circuits follow. A chapter on how nervous systems manage social interaction, focusing on vocal communication and social learning in zebra finches, is provided prior to the final section that ties together the preceding information and draws on the unique features nervous systems possess that governments typically do not, i.e., such as multiple competing mechanisms, immediate self-correction, and the ability to achieve goals in varied ways with equal effectiveness.

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Genomics, Physiology and Behaviour of Social Insects. *Advances in Insect Physiology, Volume 48.*

Edited by Amro Zayed and Clement F. Kent. Academic Press. Amsterdam (The Netherlands) and Boston (Massachusetts): Elsevier. $166.00. xv + 363 p.; ill.; index. ISBN: 978-0-12-802157-6. 2015.

The complex task coordination, communication, and self-sacrifice exhibited by the elite social insect societies, such as honey bees, ants, and termites, have been the subject of keen interest to biologists for over a century. This enduring interest in extreme forms of social behavior has been punctuated by breakthroughs in the form of paradigm-shifting hypotheses and development of novel tools with which to test them. The latest of these breakthroughs was marked by the sequencing of the honey bee genome in 2006, which facilitated the dawn of the age of sociogenomics—the quest to understand the genomic basis for social behavior. The decade since has propagated momentous strides in identifying the molecular signals from which the complexities of social insect societies emerge and evolve. Zayed and Kent have brought together experts working on the frontlines of this effort to synthesize these latest discoveries and reflect on the state of the field.