

the fact that the continents and regions have entirely different migratory topographies—Africa is vast, with interactions between deep and ancient populations, overlain by massive levels of recent movements. Europe, by contrast, perhaps because of its size or perhaps because of its historical familiarity, is represented by very specific histories—Scots, Roma, Basques. But the different scales also highlight the need for different approaches—the same perspective cannot work with both who the Scots are and the complex nature of Bantu-speaker interactions with forager populations across half a continent. Scale is crucial, if not explicitly addressed. Genetics, archeology, linguistics, and historical sources are all required, as the editors stress in their conclusion. The book does not—and does not claim to—unravel the social, political, and cultural complexities of migration today, but by its comprehensive regionality and multidisciplinary, it ensures that biology and evolution are well represented in the current literature. There may not be a simple message—migration is complicated—but it is rooted in our biology and behavior.

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ANIMAL BEHAVIOR: CONCEPTS, METHODS, AND APPLICATIONS.

By *Shawn E. Nordell and Thomas J. Valone. Oxford and New York: Oxford University Press. \$94.95 (paper). xxviii + 449 p.; ill.; index. ISBN: 978-0-19-973759-8. 2014.*

This is a new entry in the arena of textbooks for classes in animal behavior. There are many positive aspects, but a general problem with completeness. The book includes 14 chapters, which can be roughly grouped into three sections. The first group (Chapters 1 to 3) covers introductory material on animal behavior as a science, the history of the study of animal behavior, and methods for the study of behavior. The second section (Chapters 4 and 5) deals with behavior genetics, learning, and cognition. The third section (Chapters 6 through 14) covers a wide spectrum of topics involving behavioral ecology, ranging from communication to social and reproductive behavior to aspects of foraging and antipredator behavior.

The volume has many positive attributes. Animal behavior is often taught to both nonmajors and majors, sometimes in the same class. This book could be suitable for either or both. The combination of good writing, excellent artwork, and the use of tables and figures is welcomed and useful for instruction in an area where the importance of probability, statistics, and outcomes of analysis are critical. I enjoyed the fact that there

were fewer photographs than in similar textbooks; these are replaced by more graphical artwork and diagrams. Placing the definitions of important concepts, which are boldfaced in the text, in the page margin at the first use of the term is superb. The authors and publisher are to be commended for the manner in which they have accomplished the page layout scheme. Three types of “Features” are highlighted for each chapter. These include: the scientific process; a tool box containing aspects of methods; and short pieces on applying the concepts. These are a nice addition for aiding student understanding of both behavior and the way it is studied. Three appendixes further this effort of aiding students who are approaching animal behavior as a first class in science.

With all of these positive aspects, I should note that the volume falls short in terms of the evolving field of current animal behavior; I would choose one of the other textbooks that has a broader coverage. We are, thankfully, witnessing a shift back to a discipline that integrates studies of mechanisms, such as hormones, the nervous system, and behavior development, melded with the continuing interest in ecology and evolution. Missing the critical material on mechanisms means that the book is incomplete; students need to learn all aspects of animal behavior. Should the authors do a revision, their approach is excellent, but they need to add perhaps four to five chapters on mechanism topics. Examination of current literature in the primary animal behavior journals, coupled with attending national and international conferences on animal behavior, should provide both a broader understanding of the current state of the field and useful information on how the integration process is occurring.

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EXPLORING ANIMAL BEHAVIOR: READINGS FROM AMERICAN SCIENTIST. Sixth Edition.

Edited by *Paul W. Sherman and John Alcock. Sunderland (Massachusetts): Sinauer Associates. \$33.95 (paper). ix + 372 p.; ill.; index. ISBN: 978-1-60535-195-7. 2013.*

This collection of 37 articles from *American Scientist* is intended for use with students taking a basic course in animal behavior. The articles span the years from 1974 to 2012. Groups of articles are arranged under six headings: Doing Science and Studying Behavior; The Adaptive Value of Social Behavior; The Adaptive Value of Reproductive Behavior; The Evolutionary History of Behavior; The Mechanisms of Behavior; and Communication Behavior at Four Levels of Analysis. The first five

cover a wide range of topics pertaining to behavioral ecology and social behavior, while the last section is devoted to a more specialized analysis of one type of behavior. The collection of articles is designed to be used in conjunction with the textbook, *Animal Behavior: An Evolutionary Approach* by John Alcock (2013. Tenth Edition. Sunderland (MA): Sinauer Associates), although it certainly could be used as a companion to other textbooks or as a stand-alone volume for perhaps a freshman seminar on animal behavior.

The articles within each section are selected to reflect both the historical perspective on studies of that topic area and current work. Of the 25 articles in the first edition, which was published in 1993, nine are in this volume. With each succeeding volume, Sherman and Alcock have made both substitutions and additions to reflect new findings in each subject. I particularly liked the first section, which covers the basics of how we conduct investigations in animal behavior and the creativity involved in recognizing major concepts and ideas.

Each section begins with a brief essay by the editors, providing a perspective on and synopsis of the collection of articles. I found these most helpful, thorough, and concise. With perhaps the exception of three or four of the papers, those included in the book all relate to the ecology and evolution of behavior; topics such as neurobiology and behavior, hormones and behavior, and development are not included, but that is not the intention of the editors. In previous decades Thomas McGill put together volumes containing groups of articles pertaining almost exclusively to these internal mechanisms, but his work ended after three editions (1997. *Readings in Animal Behavior*. Third Edition. New York: Holt, Rinehart and Winston). As the two "halves" of animal behavior reunite in the coming decade, it will likely be important to have an edited volume that brings together papers from investigations of internal mechanisms with those covering ecology and evolution.

From my experience, and certainly true with these selections, articles in *American Scientist* are well written and edited. The excellent artwork, including figures using color and photographs, is outstanding. The book has a thorough and useful index. I would prefer to have complete, original citations to each paper included in the volume, either with each article or as a compiled list.

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NEUROBIOLOGY

LANGUAGE, MUSIC, AND THE BRAIN: A MYSTERIOUS RELATIONSHIP. *Strüngmann Forum Reports*.

Edited by Michael A. Arbib; Program Advisory Committee: Michael A. Arbib, W. Tecumseh Fitch, Peter Hagoort, Lawrence M. Parsons, Uwe Seifert, and Paul F. M. J. Verschuere. Cambridge (Massachusetts): MIT Press. \$50.00. xiii + 662 p.; ill.; subject index. ISBN: 978-0-262-01810-4. 2013.

The Ernst Strüngmann Forum is a sort of intellectual summer camp where a group of prominent researchers come together for a week to work toward a better understanding of some topical theme. The 2011 forum focused on the relationship between language, music, and the brain, and this book is the result: a set of contributions on the definitions, uses, processing, neuroscience, and evolution of language and music. The contributions are organized into four broad parts (plus an introductory section arguing for a wide-ranging view of language and music): Action, Emotion, and the Semantics; Structure; Integration; and Development, Evolution, and Culture. Each part contains a chapter that synthesizes the weeklong discussion of that particular topic, preceded by three or four chapters that cover specific topics relevant to some aspect of language, music, and/or brain, which were originally used as background for the discussions.

The contributors tackle a wide range of issues: chapters on the neurobiology of birdsong and neural correlates of human music perception rub shoulders with chapters on communication, emotion, and meaning, accounts of tribal musical traditions, music theoretic accounts of musical structure, and the use of music in film (just to name a few). Impressively, these chapters are accessible even to nonspecialists (which is important as there are probably no specialists in all of these domains) while still providing informative synopses of particular topics related to some aspects of language/music/brain relationships. And although the topic-synthesis chapters generally do not reach strong conclusions, they do raise a number of interesting questions and give a snapshot of the current state of a highly interdisciplinary field.

One current running through many chapters is the idea that language and music are grounded in neural perception-action (and emotion) circuits. That is, many (although not all) of the authors in this collection take the view that the perception, production, and meaning/emotion of both language and music rely on more basic "embodied" systems of action understanding. This focus will be

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