

Book Reviews

Behavioral Endocrinology, 2nd edition.

Edited by Jill Becker, S. Marc Breedlove, David Crews, and Margaret McCarthy. xxxviii + 776 pp. Cambridge: The MIT Press. 2002. \$110 (cloth), \$50.00 (paper).

As a practicing neuroendocrinologist, I thought I was adequately equipped to tackle my own research interests, stress, and gonadal status—until I read *Behavioral Endocrinology*. Pouring over the text, I realized that there was a lot of ground I had not considered. This was followed by a sense of relief that a single volume actually exists which pretty well covers the gamut of brain–hormone–behavior interactions, or in the very least, provides a facile point of entry for those seeking initial instruction or to broaden their research approach.

The editors and contributors of this 2nd edition represent a Who's Who of neuroscience, ethology, endocrinology, and neuroendocrinology, although some active pillars in these disciplines are missing. The text is smartly divided into five logically linked sections that are first ushered in by a Preface that, unlike most textbooks, provides a must-read glimpse into why and how this text should be approached. This is not done purely for organizational reasons, which students typically avoid, but serves to underscore the links that need to be established before one can appreciate the nuances of cause and effect between brain function, behavior, and hormone release. Inseparable or not, this represents the most difficult of hurdles facing behavioral endocrinologists. The Preface also emphasizes why this endeavor should not be restricted to studies of mice and men and how adopting a broad species approach gives birth, in turn, to broader levels of analysis, from the gene to evolution.

Prominent throughout, this necessity for diversity is immediately reinforced within the first three introductory chapters. The first introduction, covering the basic principles of how hormones and the brain interact (Jill Becker and Marc Breedlove), provides an anchor for the entire book (cross-references throughout), including discussion of experimental design and logic, basic cell biology, organization and cell communication, and brain-pituitary organization. All of this blends well with the second introductory

chapter (Margaret M. McCarthy and David Crews) describing how to apply a variety of techniques, including molecular approaches, to the diversity by which hormones operate on gene expression, the nervous system, and behavior. This section covers a variety of methods, both new and old, and is quite up to date with respect to novel receptor isoforms and techniques employed to distinguish between rapid (nongenomic) and classical (genomic) modes of hormone action. Rare indeed, the authors introduce clever experimental scenarios toward emphasizing that it is the question at hand that drives technique, and not the opposite trap we so often fall into. The third introductory chapter (S. Marc Breedlove and Elizabeth Hampson), like the first two, sets the tone for the rest of the book chapters by discussing the pivotal nature by which hormones determine phenotypic sex, gender-specific behavior, and physical characteristics. Along the way, the reader is introduced to the idea of how hormones exert different effects during critical periods and how animal models of behavioral endocrinology can be applied to those interested in understanding the human condition, as far-reaching as sense of self and gender identity.

Section 2 links six chapters covering reproductive behavior in a variety of species, starting in Chapters 4 and 5, respectively, with the neuroendocrinology of sexual behavior in the female (Margaret M. McCarthy and Jill B. Becker) and in the male rodent (Michael Baum). Both of these provide a valuable link to the subsequent discussion in Chapter 6 on the endocrinology of human sexuality and difficulties in assessing determinant factors (Sue Carter). Baum's chapter also depicts several strategies and techniques that can be used to unmask how hormones operate on different components of behavior (e.g., motivational, consummatory), and on different sensory modalities. Chapters 7 and 8 in this section wonderfully illustrate how studying distinct species (David Crews) and different groups of vertebrates (Darcy Kelley and Eliot Brenowitz) provide insights unattainable with conventional laboratory animals. Employing the red garter snake in an evolutionary context, for example (David Crews), the diversity by which hormones regulate mating behavior is magnified even more, in which questions can be asked about how competing physiological and environmental constraints can meet head-on to

alter brain–sex steroid relationships and interceding shifts in neuroendocrine function. Using courtship behavior as a template, Kelly and Brenowitz further expose the power of comparative studies by contrasting the organizational and activational effects of sex steroids in electric fish, clawed frogs, and songbirds. This section ends with Chapter 9 on the relationship of hormones and parental behavior (Larry Young and Thomas R. Insel), providing the reader with yet another opportunity to see how different behaviors are mediated by different circuits in the brain. This chapter speaks for the entire section, underscoring that no single species can fully unmask or explain the cellular and mechanistic diversity by which hormones operate. On the whole, this section provides a clear outline of how to approach behavioral and hormonal interactions, the importance of cross-species comparisons, and how these strategies can be used to further unravel redundancies in circuits and factors mediating behavior.

The third section of the text is comprised of Chapters 10–12, examining the relationship between hormones and regulatory systems distinct from, but ultimately linked to, reproductive function and behavior, including the immune system (Christopher Coe), hormonal regulation of the stress response (Robert Sapolsky), and systems regulating biological rhythms (Michael Gorman and Theresa M. Lee). Neuroendocrine and behavioral influences on the immune system represent a new addition to the text and clearly places the immune system into the context of behavioral endocrinology. Collectively, this section provides a clear and provocative account of the intimate nature by which these regulatory systems interact, and how this interaction helps to explain individual differences in responses to homeostatic threat and predisposition to disease.

Drawing from the complex nature by which hormones integrate different physiological and environmental constraints and harmonize different regulatory systems, Section 4 takes us one step further into the realm of cognition. This section begins with Chapter 13 describing how hormones regulate converging sensory and motor information in the rat and its implication for understanding drug addiction (Jill B. Becker). This is followed by Chapter 14, with a rich and in-depth illustration of the effects of sex and adrenal steroids on learning and memory; how cognitive abilities are

influenced by emotion, arousal, and attention; and how different aspects of the limbic system tend to the organizational and activational effects of sex steroids on cognition in nonhuman animals (Christina I. Williams). These preceding chapters provide a guide to the final, Chapter 15, of this section (Elizabeth Hampton), in which gender and individual differences in human cognition are explored as a function of dynamic changes in sex steroid levels. On the whole, this section encourages one to think about sex steroids beyond the realm of reproduction and that brain function is constantly subject to hormonal influences throughout our lives.

The final section of the text underscores that the relationship between hormones and behavior is not a two-way street, but a reciprocal one affording a greater capacity for organisms to adjust to changing internal and external cues. Although this theme runs deep throughout the entire text, it does come as a welcome reminder at this stage. Chapter 16, the first of three chapters in this section, uses drinking behavior and glucose metabolism as a model for reciprocal hormone-behavior relationships (S. Marc Breedlove) and underscores how a simple matter of eating involves an impressive array of circulating hormones and brain nuclei. Chapter 17 revisits the comparative approach (James W. Truman) in which the metamorphosis of the insect nervous system provides a unique opportunity to study simple sensory, nervous, and motor programs that use molecules conserved across species boundaries. This chapter also explores antagonistic behavior in the lobster, introducing a fascinating and underexplored model of how social order and hormones can interact to conserve behavioral programs and determine reproductive fate. The final Chapter 18 revisits an earlier concept that hormones do not drive behavior per se, but determine the likelihood of a behavior occurring (Rae Silver and Lance Kriegsfeld), reflected in the dependency by which sex steroids operate on tactile sensory information to promote or antagonize reproductive behavior. The codependency and converging nature by which hormones and sensory systems operate is also illustrated in the vomeronasal system, in which several striking similarities are seen between rodents and humans with respect to olfaction and reproductive status.

In sum, *Behavioral Endocrinology* provides a fascinating multidisciplinary and bold approach to the how, where, and why

hormones operate on the central nervous system and behavior. While this text, for all the right reasons, places an emphasis on reproduction, it does provide a practical generalized approach on how to isolate and study specific sensory systems and convergence with endocrine systems that can be easily extended to other neural systems and behavioral repertoires. This book is a must-read for any neuroscientist interested in adopting or extending a whole organism or systems approach. Given its behavioral context, while appropriate to psychology, the scope of *Behavioral Endocrinology* makes it an ideal primer for students of neuroscience.

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Human Population Dynamics: Cross-Disciplinary Perspectives. Edited by Helen Macbeth and Paul Collinson. xvi + 224 pp. New York: Cambridge University Press. 2002. \$75.00 (cloth), \$28.00 (paper).

This volume is part of the Biosocial Society Symposium series. The book is carefully edited, as several chapters refer to information in other chapters. The format also shows a unity of style. The volume could be used as a supplement in an upper-division course in human biology, biological anthropology, and demography.

Perhaps my favorite chapter was the Introduction, where H. Macbeth and P. Collinson discuss the ways in which various disciplines are interested in human populations, thus establishing that this is a truly multidisciplinary endeavor. I particularly appreciated their overview of the definitions of a population in different fields. Chapter 2, by A. Hinde, is a thorough introduction to demographic perspectives and is excellent for teaching. Hinde discusses, among other things, the demographic transition theory and does a great job of illustrating demography from a cross-cultural perspective. Chapters 3 and 4, by J.I. Clarke and

R. Layton, complement Hinde's chapter by discussing the demography of large geographical areas in the recent past and of peasant societies, respectively. I particularly appreciated Clarke's emphasis on demographic variation within major regions such as Latin America and Layton's careful comparison of peasant with hunting-gathering groups. Some readers may find Layton's chapter too cultural for a biosocial book, but in my opinion it is refreshing. Chapter 6, by R. Smith, on social institutions and demographic regimes in nonindustrial societies, provides interesting data. However, as an anthropologist, I question the wisdom of several generalizations presented here. For example, is there truly one single marriage type for all of Africa? However, Smith's emphasis on nuptiality complements very well the chapters already discussed. Chapter 7, on child survival, by E.K. Rousham and L.T. Humphrey, is excellent. It begins with a review of the major causes of childhood death in human groups with low and high childhood mortality, and includes issues such as gender associated discrimination and infanticide. I particularly appreciated the authors' pointing out that childhood mortality affects a population's genetic structure. Chapter 9, by P. Kunstadter, will be very appealing to anthropologists because it looks at the effect of different cultural practices of two small groups in Thailand on their fertility and mortality.

There are some weaknesses in the volume. The last chapter (10), on ecology, should have followed the Introduction, since it provides more theoretical background. And the two chapters on genetics are disappointing. Chapter 8, by L. Jorde et al., is on the genetic structure of south Indian populations and reads more like a research paper than a book chapter. Thus, it was written in a different manner from the rest of the book and did not provide the type of student-friendly reviews that the other chapters gave. Chapter 5, by J. Betranpetit and F. Calafell, describes genetic variation and is supposed to provide a needed review of genetics, which would supplement the other chapters. However, it is not clearly titled and covers too many things too shallowly: from the 23 pairs of chromosomes in humans to evolutionary psychology. It does not provide the necessary genetics background for the rest of the book. I am particularly disappointed that the authors did not mention or even

acknowledge the extensive critique of the Human Genome Project.

In conclusion, my assessment of the book is mostly positive. This would be a nice supplement for a course, and many of the readers of this journal will enjoy having it on their bookshelves.

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The Evolution and Genetics of Latin American Populations. By Francisco M. Salzano and Maria Cátira Bortolini. xvi + 512 pp. New York: Cambridge University Press. 2002. \$95.00 (cloth).

When I saw that Francisco Salzano had written a new book on the evolution and genetics of Latin American populations, I eagerly anticipated an update to his landmark work with Callegari-Jaques (1988) on the evolution of South American Indians some 25 years ago. What I found was different from what I expected, but not without its own pleasures. This book seems to be primarily a collection of tables summarizing various facts about Latin American populations throughout prehistory and recorded history. Think of it as an almanac or atlas of human variation in South and Central America.

I found it a little confusing to read a very brief overview of the history of modern humans in Europe, Asia, Africa, and the Americas, but I can understand the need to introduce the different source populations that contributed to the Latin American gene pool, including slaves from Africa, European conquerors, discoverers, and migrants, Asian migrants, and the original migrants into the New World via the Bering Strait. The book chronicles these different waves of migrants, their sources, and the timing of these events and is basically a compilation of data from many disparate sources about the extant and extinct populations of Latin America. Having this information all in one place can be useful to researchers in many fields, although I find it difficult to ascertain the veracity of the data presented

in the tables. There is typically a single source for each table. For example, Table 1.7 is a "List of some of the African States of Empires which were formed in a period of 3.4 thousand years." Discounting what "a period of 3.4 thousand years" means, it is a list of about 20 populations with a chronology from 1500 BC to 1890 randomly spaced around Africa. The single source is Curtin et al. (1978). Cavalli-Sforza et al. (1994) is the source for a number of the tables, some augmented by other secondary sources as well. This is useful to have all in one place, but I am left wondering how accurate and complete, and therefore how useful, these data are. In other tables, many sources are given.

After setting the stage for origins of the various peoples of Latin America, the authors describe in Chapter 2 the many diverse political and ecological environments. A very brief history of Latin America follows, sort of a "Latin American History for Dummies" or crib notes guide to the political history of Latin America. They use the slightly unusual, although space-efficient, approach of citing the references for each subheading in the subheading. For example, "The Conquest, Spanish America (see Elliott, 1997a)" is followed by three short paragraphs on the two primary waves of conquest of Latin America by Spain. Similar treatments follow for the conquests by Portugal, then the colonial periods that followed, some citing two to four references after each subheading. It saves space, but leaves me unsure of who is providing what information. Nonetheless, it is very useful to have all this information in short bites to get a rapid overview of the region. From this historical background we are briskly led through independence and up to the present-day political and socioeconomic status of Latin America, mostly in the form of 14 consecutive tables. Again, the majority of tables cite just a single source; a few cite two or three sources.

With this whirlwind background in place, the authors delve into the socioeconomic, demographic, and population structures of Latin America in Chapter 3. This is the area of expertise of the authors that is evident in excellent discussions of specific populations and the factors which influence their structure and behavior. The citations all fall within the text here, and they do an excellent job of pulling the information together. This third chapter ends with 17 consecutive, well-annotated tables on

socioeconomic, demographic, and population genetic variables.

Chapter 4 focuses on growth and development in Latin America, for which there is a tremendous body of anthropological and human biological literature to which the authors have contributed. The chapter lists primary sources of food production, growth and development, and physiology (including adaptation to life at high altitude). Twelve tables end Chapter 4, summarizing many key articles in the studies of growth and development in Latin America. Again, it is well-annotated throughout and segues logically into Chapter 5 on "Morphology," which comprises most of the traditional physical anthropology of Latin American populations and, again, an area of considerable expertise for the authors. They cover anthropometrics, dermatoglyphics, skin color, craniometrics, hair studies, anatomy and bone biology, and cellular biology. They discuss heritability, selection, assortative and directional mating, and genetic determination of traits. Chapter 5 ends with six consecutive tables summarizing these sources of physical anthropological data in Latin American populations. I found these somewhat random and slightly less interesting than some of the other compiled tables, and we are back to single sources for the tables.

Logically, the book follows the physical descriptive chapters with Chapter 6 on "Health and disease." The authors cover the history of various epidemics in the Americas. Again, in a whirlwind fashion, they acknowledge in the beginning that the health of a continent is too big a subject for anyone to really summarize. They discuss inherited diseases, infectious diseases, and environmental diseases, as well as the immunology related to them. Chapter 6 ends with 14 consecutive, well-annotated tables on disease and health patterns and summaries of studies in Latin America. Chapter 7 continues the health theme, specific to "Hemoglobin types and hemoglobinopathies." Since there are a plethora of blood group studies of the New World, many by Salzano, the chapter provides a good, quick overview. The level of detail is sufficient to provide the reader with the ability to inspect and understand the data in the 18 well-annotated tables at the end of the chapter.

Moving from classical physical anthropological measures like anthropometrics and dermatoglyphics, to blood group markers, the book moves logically into protein and

DNA variation in Chapter 8. These topics are what Salzano and Bortolini are best known for, and there are many figures in this chapter with analyses of data. The text is all too brief here, and 22 consecutive well-annotated tables end the chapter.

Next, in Chapter 9, the authors start to make use of all the data previously presented. They explore the genetic variation relative to race and the origins of the current inhabitants of Latin America. They discuss the differences in genetic origins by sex, and the reasons for it. They end with 13 consecutive well-annotated tables, largely on admixture estimates using different genetic systems for different parts of Latin America. The authors end the book with Chapter 10, a very brief synthesis summarizing what was in each chapter and why, and some discussion of the future of Latin America and its peoples.

Overall, the book is a valuable first resource for people such as physical anthropologists and population geneticists looking for quick information about the peoples of Latin America. The annotation and level of detail was fairly weak in the first half of the book but became exceptionally detailed in most of the rest of the book. It left me wanting to investigate many of the areas in greater detail, a good thing. I would recommend it as a place for people to start to find information about Latin American populations, leading back to original sources. A centralized location for these disparate and interconnected data makes it easier to synthesize when investigating hypotheses about the peoples of Latin America.

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Human Ecology in the New Millennium. Edited by Veena Bhasin, Vinay K. Srivastava, and M.K. Bhasin. x + 259 pp. Delhi, India: Kamla-Raj Publishers. 2001. \$45.00 (cloth).

According to its editors, the volume *Human Ecology in the New Millennium* unites the contributions of many international scholars to human ecology. They also argue that the range of contributions represented in this volume demonstrates that the field is interdisciplinary and that is the way the field should be approached. Human ecology is founded on collaboration between the physical, natural, and social sciences and demands not only robust theory-building but also strategies for problem-solving at the human–environment interface. It has to critique and reconcile the adaptationist stance in both biology and anthropology with current challenges of modernity and postmodernity as well as encounters of the local with the global (all the while acknowledging human agency or free will). Given this tall order, it is not surprising that talking across interdisciplinary boundaries and diverse goals is an intimidating, often thankless job. The various authors' volume, particularly, in my opinion, those in the opening section, have attempted to explore and present a framework for advancing human ecology but the volume as a whole has fallen short in presenting the field as cohesive, dynamic, and promising. I attribute this shortcoming not only to failure in adequately conceptualizing what connects the various threads of human ecology but also to failure in thoughtfully drawing from its intellectual history in biology and anthropology. For example, as an anthropologist, I found notable and unfortunate the absence of any reference to Bennett and Rappaport, each of whom sketched out a conceptual framework for understanding humanity's impact on the environment based on evolving human frames of reference for interacting with the biophysical world. I believe no advances can be made unless it rests on a solid foundation.

There is indeed a wide range of ideas and interests represented in the different chapters; in this, the volume does a good job. However, and this is where my disappointment begins, when one picks up an edited volume the first question that comes to mind is, what new insights to scholarship or

approaches to more applied work does this collected work offer on an important theme? The theme of advances in human ecology is undoubtedly an important one, one might even say pressing, yet I do not believe this volume moves beyond being a collection of disparate papers which have very little in common. The 23 chapters range over seven sections covering topics as diverse as general perspectives on human ecology and the "ecology" of health, human growth, resources, biological dimensions, archeology finds and history, and disasters and global change. Any one of these topics could be a theme for a single volume, but it is nothing less than daunting to find them all in one volume with very little connective tissue. Were these papers commissioned following a recent international conference on human ecology in the new millennium, or were existing papers pulled together for a special issue of the journal *Human Ecology*, and if the latter, based on what selection criteria? Whatever the merits of individual chapters, and I found some thought-provoking, the volume does not succeed in advancing knowledge or breaking new ground in any significant way. I also noted typographical errors, obtuse language, and other editorial oversights spread throughout the volume. Although perhaps a minor point, these distractions made getting a sense of coherence and serious scholarship even more elusive.

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Evolving Health: The Origins of Illness and How the Modern World Is Making Us Sick. By Noel Boaz. vi + 250 pp. New York: John Wiley & Sons. 2002. \$27.95 (cloth).

Evolving Health, is a book by a biological anthropologist, and M.D., Noel T. Boaz. Boaz delivers on the promise of his subtitle, providing the reader with an organized investigation of how human evolutionary and recent social history has produced a number of ailments which afflict mankind. One is

reminded of other such exciting investigations, like those of Hans Zinsser and Alexander Alland or, more recently, Horacio Fabrega. What is unusual is that Boaz has constructed the framework for his work from evolutionary psychology and the new field of Darwinian medicine. Medical anthropologists will search in vain for any references to their discipline.

Boaz claims in the Introduction that "It is possible to prevent most modern diseases." He attributes our modern maladies to our departure from an assumed ancient "normal" lifestyle of our hominid ancestors. The book is organized by an evolutionary scheme based on the development from one-celled organisms to complex mammalian adaptations. His theory suggests that by a proper analysis of these adaptations we can find the means to avoid illness. None of the cross-cultural analyses collected and built by medical anthropologists and epidemiologists that concern the cultural construction of illness (e.g., Fabrega, 1974) are mentioned. In the place of this paradigm we find a reductionist analysis similar to those prevalent in evolutionary psychology today (e.g., Buss et al., 1998). The format of the book is based on concepts of evolutionary medicine espoused by Trevathan et al. (1999), although he makes reference to other theorists like Nesse and Williams (1998). By organizing the biological evolution of life around specific developments in physiology fundamental to the mammalian success, Boaz achieves a coherent picture of why changes in our behavior affect our physiology adversely by interfering with function. This works nicely and produces the kind of explanations which the public and students can respond to in a way that makes science both interesting and useful. This is especially successful when he is discussing diet and exercise.

We find in *Evolving Health*, however, a basic idea common to many popular New Age philosophies, that there was a perfect time in the past when society and humans lived in harmony with nature and if we can only get back to that "hominid normality" we will be healthy. Gillick (1985) summarized some of the concepts shared by these philosophies. To be fair to Boaz, he recognizes the complexities of human society and the long historical consequences which have created the present conditions which limit the mass of populations' access to the basic resources for normal development and health (Farmer, 1999). The evolution of the

human diet is presented in the context of physiological changes and the adaptive radiation of hominids. Ungar and Teaford (2002) have produced a detailed analysis of this process, but Boaz's approach is clear and precise for a general audience.

In the context of an assumed healthy hunter and gatherer past adaptation, however, aside from diet and the activity of gathering, we hear nothing of the role of recreation, of dance, song, play, and certainly sex in maintaining health through exercise. Most of the discussion of sex is in relation to reproduction, whereas the idea of a role for sex in maintaining health is missing. Certainly we see a healthy discussion of this in bonobos these days (de Waal, 1995). Isaac encouraged us to consider this role in his introduction to Mellen's text (1981), and noted the lack of concrete comparative data. This idea of health and exercise has become a droll fetish of physical activity divorced from the cultural pursuits that such activity was traditionally associated with and is now incorporated into just another aspect of consumerism.

Nevertheless, there are serious problems with this book, the most obvious of which is the assertion of error for fact, as on page 74 where the author tells us that, "Animal species in the wild have not been observed to contract cancer." One might quibble about the meaning of cancer, neoplasms, tumors of various kinds, etc., but there is no doubt that animals other than humans are susceptible to such growths and to the disease we define as cancer. Examples can be found in wild deer (Sakai et al., 2001) and in fossil species (Pierard et al., 2001). Again, on page 45 concerning Down's syndrome we are told that "No similar condition is known in non-human primates or other animals." This is contradicted by established cases in chimpanzees (McClure et al., 1969). The idea that amphibians reflect the original five-digit hand (p. 157) would be a surprise to salamanders and newts, which have four. Romer (1957, v.1, p. 47) clearly notes that amphibians have four toes and fossil evidence indicates that some forms had as many as seven (see also McGowan, 1984). Boaz also states on page 167 that australopithecines had intermediate brain sizes between apes and humans. I cannot imagine what he is referring to here, but it is clear that of the ape data exhaustively reported by Semendeferi and Damasio (2000) there are

no known australopithecine specimens with brain sizes intermediate between extant apes (less than 500 cc) and contemporary humans (~1300 cc). Such an australopithecine figure would have to be around 800 or 900 cc and present data show none above 550 (Conroy et al., 1998; Aiello and Dunbar, 1993). The discussion on psychological problems is instructive to the general student and parallels reports by workers like Kleinman, Cohen, and others (Editorial, 1997).

One might assume that the errors noted above resulted from a text the author produced having been rewritten for a popular audience by an editor. I would hope that the author would produce a revised edition in the future to correct them.

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