

A Fearful Symmetry

Tiger Bone & Rhino Horn: the Destruction of Wildlife for Traditional Chinese Medicine. Ellis, R. 2005. Island Press, Washington, D.C. 294 pp. \$26.95 (hardcover). ISBN1-55963-532-0.

Richard Ellis has written a timely book that provides useful background information for understanding a new and rapidly unfolding effort to stem illegal wildlife trade. According to the U.S. Department of State, the annual illegal trade in wildlife and wildlife parts is worth an estimated US\$10 billion and is third in revenue only to arms and drug smuggling. In the face of this astounding and unsustainable wildlife trafficking, the Convention on International Trade in Endangered Species of Fauna and Flora (CITES), a major international conservation achievement of the 1970s to control the trade in threatened and endangered species, is in need of serious teeth. The U.S. Government's Coalition against Wildlife Trafficking (CAWT) was launched in 2005 to build a global coalition to "...focus political and public attention on the issue and facilitate action for effective wildlife law enforcement and regional cooperation." Also in 2005, the ministers of the Association of Southeast Asian Nations (ASEAN) agreed to develop a "Regional Action Plan on Trade in Wild Flora and Fauna" and expand the regional wildlife law enforcement network. This is backed up by a grant from U.S. Agency for International Development (USAID) to the nongovernmental organizations WildAid and TRAFFIC and their local partners to improve the efficiency of wildlife and customs law enforcement officers in the region by pro-

viding training, equipment, and improved networking capability.

The use of wildlife parts and products has a long history in Asia, as in most areas of the world. Until recently the largest and fastest growing markets for medicinal products reputed to contain tiger bone were in the United States, Canada, and Western Europe. Several "tiger farmers" in the United States recently have been convicted of raising tigers for their hides and meat. In the past, the cost of products purported to contain wild cat parts was generally beyond the reach of the average person. As Asian economies and individuals accumulated more wealth, the increase in disposable income resulted in these products becoming more affordable.

We do have to ask, though, how much of the illegal trade is being driven by demands for traditional Chinese medicine (TCM) or status-linked exotic foods? In the consumption of these products, the distinction between food and medicine becomes blurred. Many think that whatever is good for you in small amounts is better for you in large amount. So rather than a pinch of tiger bone powder in your wine to treat an ailment, the newly rich indulge in a dinner of tiger penis soup, also a status symbol. Ornamentation also drives this market. Recently, a flourishing market in tiger skins to decorate status clothing of Tibetan horsemen was reported.

Tiger Bone & Rhino Horn has seven chapters that focus on, but are not restricted to, the charismatic megafauna of the chapter titles. In two chapters, "Tyger, Tyger" and "Where Have All the Tigers Gone?" Ellis describes the precarious status of wild tigers and their place in TCM. Unfortu-

nately this book was published before the haunting spectacle of poachers killing the last tigers in India's Sariska Tiger Reserve in late 2004, which was widely reported in 2005, and before the report by the Save The Tiger Fund and its partners, Worldwide Fund for Nature, Wildlife Conservation Society, and the Smithsonian's National Zoo, that wild tigers occupy 40% less habitat in 2006 than they did a decade earlier.

"Suffer the Animals" introduces the use, quantity, and value of wildlife parts in TCM. In "Chinese Medicine, Western Medicine," Ellis compares the origins, linkages, and development of these medical traditions and introduces the basic tenets of TCM. The use of rhinoceros and narwhal horn in TCM is traced in "Horn of Plenty." Ellis tries to clarify the myth, which western journalists are so addicted to, of rhinoceros horn as a sexual enhancing substance; it is not. But all parts of an Asian rhinoceros have some role in local folk medicine. In this chapter too, the role of rhinoceros habitat conversion to agriculture and the Yemeni demand for rhinoceros-bone jambiya (dagger) handles, rather than TCM, in driving the illegal market is explored, including the controversial practices of harvesting horn from living rhinoceros and substituting saiga (*Saiga tatarica*) horn in the TCM market, which was a disaster for the saiga.

In "The Bad News for Bears," killing of wild bears and the practice of farming bears, usually Asiatic black bears (*Ursus thibetanus*) so that their bile can be harvested through implanted catheters, is described in detail. Ellis reports that the active ingredient in bear bile, ursodeoxycholic

acid, can be synthesized for about 16 cents a pill, but practitioners of TCM prefer to obtain it from bear gall bladders.

In the final chapter, "Tigers, Rhinos, and Bears—Oh My!" Ellis reports that in 1993 the Chinese government published a notice that forbid selling, buying, carrying, or mailing rhinoceros or tiger bone. This declaration has served as a deterrent to an illegal trade, but Ellis somberly reflects on conflicts in values that underlie the title of his book: "The slaughter of rhinos and tigers for the questionable needs of TCM is terrible enough, but it would require a view of humanity far more cynical than mine to see who would encourage poachers as actually wanting to bring about the extinction of the species."

Poachers kill rhinoceroses and tigers to make money. Extinction is an unintended consequence. I do not think there is anything cynical in this calculus; it is simply the economics of overexploitation driving the march to extinction for rhinoceroses and tigers. Increased purchasing power in Asia has created a substantial demand for imported illegal rhinoceros and tiger parts. The government institutions erected to deter this illegal commercial enterprise in the last 30 years are too weak to deter buyers, traders, or poachers effectively. The extinction of wild rhinoceroses and tigers, which number in the low tens to low hundreds to low thousands of individuals, depending on the species, is inevitable if this cycle continues.

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Big Blue Gets Its Due

Marine Conservation Biology: The Science of Maintaining the Sea's Biodiversity. E. A. Norse and L. B. Crowder, editors. 2005. Island Press, Washington, D.C. 496 pp.

(xxvi + 470). \$49.95 (paperback). ISBN 1-55963-662-9

"In the end we will conserve only what we love; we will love only what we understand; and we will understand only what we have been taught" (Baba Dioum 1968 speech in New Delhi, India). This quotation from the Senegalese environmentalist is a fitting description of the goal of Norse and Crowder's new volume—that is, to educate both scientists and the general public to advance our awareness and understanding of marine conservation biology. Marine conservation usually is discussed in one or more chapters in various marine biology, oceanography, and conservation biology texts, but this volume is the first, to our knowledge, to suitably address marine conservation as a field of study. The editors begin with two introductory chapters, and the subsequent 23 chapters are divided into five sections, with each chapter written by one or more leading experts in the field.

The first section is composed of four chapters on marine population biology and ecology, including life-history strategies, Allee effects, extinction, and the often overlooked topic of behavior in marine systems. A comparison of marine and terrestrial systems is included in many chapters, highlighting why conservation of marine ecosystems is different, and, some would say, more challenging than that of terrestrial ecosystems. There is noticeable overlap of material in the chapters on life history and Allee effects, and some material covered in the extinction chapter is later repeated in the section on threats.

The next two sections include four chapters on threats (nutrient overenrichment, invasive species, disease, and multiple stressors) and five chapters specifically on fisheries, the most pervasive threat to marine ecosystems. Most of the substance of these chapters describes the threats themselves, with minor emphasis on conservation actions such as threat reduction, restoration, and manage-

ment. The chapter on multiple stressors provides innovative suggestions on how the management approach of solving a single stressor could be improved by a more complex, multifaceted approach to coastal management. A discussion of the effects of global climate change on marine systems was conspicuously absent from this section, and subjects such as pollution (other than nutrients) and sedimentation received little mention.

The fisheries section includes an excellent contribution by Preikshot and Pauly, which discusses the difficulty of uniting conservation and sustainable fisheries because of historical management practices and the evolution of fisheries science. Watling (chapter 12) provides a clever comparison of fishing disturbance to both forest clearcutting practices and oil drilling, emphasizing impacts on the generally understudied benthic soft-sediment habitats that comprise the majority of ocean habitats and contain the majority of biodiversity. Chapter 13 on long-lived species is somewhat repetitive of earlier chapters, but includes useful management suggestions for fishing regulations and gear modification. Chapter 14 on evolutionary effects of fishing, although significant, seems overly specific compared with that of other chapters in this section. Surprisingly little emphasis is given to bycatch in this section, considering the prior successes of conservationists in reducing bycatch impacts.

The fourth section includes four chapters on place-based management (aka marine protected areas), the most popular tool in the marine conservation toolkit. The authors not only sing the virtues of marine reserves but also discuss their limitations, particularly with respect to fisheries management. The underlying consensus is that marine reserves will be most effective when they are part of a comprehensive coastal management plan. Chapter 18 offers a timely argument for marine protected areas in the high seas, noting challenges due to the highly migratory nature of open-ocean

megafauna, the difficulty of establishing and enforcing marine reserves in the open ocean (including the need to protect “ecosystems that move” such as upwellings at divergence zones), and the need to protect ecological linkages between the benthic and pelagic zones. Chapter 19 discusses marine metapopulations, a central paradigm of conservation biology and clearly shows that one size does not fit all with respect to dispersal processes and marine reserve design. We disagree with the authors’ broad application of the metapopulation concept, calling any spatially structured, interconnected population a metapopulation. Regardless of our disagreement with terminology, this chapter’s emphasis on larval dispersal complements other chapters describing juvenile and adult dispersal processes to provide a complete discussion of the ecology governing marine reserve design.

The final section sets this volume aside as one of the first marine volumes to adequately discuss the human dimension of marine conservation. Usually cast aside as a final chapter, or even a section within a discussion of marine conservation, the editors dedicate six chapters to concepts that are as important as understanding biology for conservation—how to manage human interactions with the marine environment. Chapter 20 gives an informative socioeconomic review of the conditions under which fishers will develop effective conservation rules, providing a rare instance of communication between the social and biological sciences. Other chapters in the section detail legal regimes, public policy, and how uncertainty and the misallocation of the burden of proof have resulted in fragmented, risk-prone decision making by marine resource managers. Chapter 23 takes a novel look at the human dimension, asking if being able to restore ecosystems will cause society to be less concerned about ecosystem degradation. The chapter on environmental ethics creatively demonstrates the need for

a “doe-eyed invertebrate” to change the public views of the ocean toward development of a “sea ethic” in the same vein as Leopold’s land ethic. The final chapter serves as a synthesis, showcasing the frontier mentality commonly exhibited in the open ocean, to recommend a comprehensive, integrated, placed-based management framework of open-ocean zoning.

One general issue with the volume is that many of the chapters concentrate primarily on megafauna and commercial species with wide-ranging distributions and dispersal capabilities. Because dispersal and connectivity processes are rarely known when designing marine protected-area networks (and in fisheries management), the focus on long-ranging species and the “open population” concept that has dominated marine ecology for recent decades goes against the current trend in empirical studies that demonstrate significant larval retention and ignores the large proportion of species with no planktonic dispersal stage. Also, most chapters (with the exception of Watling’s chapter on fishing disturbance) focus on charismatic species and/or habitats, reflecting the overall bias toward these types of species and habitats in fisheries management and conservation research. Finally, the examples are biased toward U.S. marine ecosystems, although the editors apologize in advance for this bias.

Marine Conservation Biology is suitable for upper-division undergraduates or graduate students with basic knowledge of marine populations, ecology, and oceanography. Some of the chapters (e.g., Botsford & Parma and Lipcius et al.) involve more complex concepts and theoretical models that may be beyond the reach of a general audience. Nevertheless, even these more-challenging concepts are presented in an easy-to-follow style, and the chapter on metapopulations is adequately presented as a series of illustrations without the underlying mathematical equations that might distract

from understanding the basic concepts. This is an important book because it comes at a time when marine conservation is trying to find its voice and gain legitimacy (and notice) in the terrestrial-dominated field of conservation biology. *Marine Conservation Biology: The Science of Maintaining the Sea’s Biodiversity* should go a long way in achieving these goals.

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Conserving the Tree of Life

Phylogeny and Conservation.

Purvis, A., J. L. Gittleman, and T. Brooks, editors. 2005. Cambridge University Press, New York. Conservation Biology Series 8. 444 pp. (xiii + 431). \$60.00 (paperback). ISBN 0-521-53200-0.

If one were to paraphrase for application to the twenty-first century Dobzhansky’s classic 1973 statement about the relevance of the study of evolution to the field of biology (“Nothing in biology makes sense except in the light of evolution.”), it would undoubtedly be “Nothing in biology makes sense except in the light of biodiversity conservation.” In the last year alone the number of books that have appeared that address conservation from a particular biological discipline or perspective is remarkable. For example, consider *Taxonomy and Plant Conservation* (Leadlay & Jury 2006), *DNA and Tissue Banking for Biodiversity and Conservation* (Savolainen et al. 2006), or *Plant Conservation: A Natural History Approach*

(Krupnick & Kress 2005) compared with *Plant Conservation: An Ecosystem Approach* (Hamilton & Hamilton 2006). There are others as well. Each of these volumes examines how a field of biology can contribute to the assessment, management, and conservation of biodiversity and the environment. Many of us who have been trained in a basic research field, such as taxonomy or ecology, are, as we watch the daily degradation of the environments around us, compelled to apply our knowledge, perspectives, and skills to the conservation of nature.

A recent addition to this multidisciplinary approach to conservation is *Phylogeny and Conservation*, a volume edited by Andy Purvis, John Gittleman, and Thomas Brooks. The editors have assembled over 50 scientists, mostly population biologists, molecular ecologists, systematists, and conservation biologists, to address how the field of phylogenetics can inform conservation assessment and management. Many of the chapters are worthy contributions to the subject, yet I found that in general most chapters either address phylogeny or conservation, but rarely both (and in a few instances essentially neither). In some cases authors only consider the conservation aspects of their subject in the final few paragraphs of the chapter (e.g., chapters 2, 7). In other chapters the definition of phylogeny, which I think most biologists would agree encompasses evolutionary relationships at the species level and above, is stretched to cover population-level processes, phylogeography, and ecology (e.g., chapters 4, 8, 11). If I did not know the title of the volume, I would certainly find almost all of the contributions informative and interesting in many ways, but most of them are just not about “phylogeny and conservation.”

Phylogeny and Conservation is divided into four parts, each of which attempts to examine the role that information on phylogeny plays or

could play in conservation: “Units and Currencies,” “Inferring Evolutionary Processes,” “Effects of Human Processes,” and “Prognosis.” The first part focuses on species as the basic currency of conservation, and its chapters outline how molecular phylogenetics play a role in identifying these basic units and conserving them. The chapter by Avise (chapter 4) is the most eloquently written and engaging account in this section. Phylogenetic distinctiveness is often cited as the most important aspect of evolution applicable to conservation measures, so it is provocative that Avise concludes the contrary, that such evolutionary distinctiveness has no practical impact on conservation efforts. On the other hand, evolutionary patterns within species (arguably not phylogenetic patterns) may have a considerable relevance to conservation, especially with regards to biogeographic distributions.

Part two, on inferring evolutionary processes, is meant to tell us, according to the editors, how observed patterns of diversity can be judged against null models to assess conservation status, how evolutionary processes and patterns should and can be conserved, and how understanding the history of lineages in the past may inform us of how they will respond to environmental changes in the future. The chapters in this section do tell us a lot about the analysis of geographic range and phylogenetic age of lineages, the role that ecology may play in the process of divergence and speciation, and the effects of climate change on populations. Nevertheless, like much of part one, only a cursory discussion is provided of the application of these data to real conservation issues. Moritz and colleagues (chapter 11) provide the best analysis of phylogenetic diversity, biogeography, and the threat of future climate change to this diversity in the rain forest regions of northeastern Australia. By combining data on two unrelated groups of animals (snails and the herpetofauna) they identify

and confirm the most important areas for conservation in this species-rich region of the country.

Parts three and four of the book add the explicit human component (implicit in the preceding chapters) to the biological mix of conservation. Through a number of approaches several authors (chapters 12–14) argue that the relationship of geographic distribution and/or taxonomic position to conservation threat or extinction risk is not random (i.e., for a species under threat, both where it is found and what biological characteristics it possesses will in large part determine its fate). The impact of human-introduced invasive species on the extinction of biodiversity also is considered (chapter 16), especially the role taxonomic relatedness plays in the likelihood of becoming an invasive pest. The last two chapters, perhaps the most provocative of the volume, attempt to put conservation into a broader phylogenetic perspective, but each in a different way. Ne (chapter 17) suggests that in considering the entire tree of life (what some call “The Big Tree”) only a few terminal twigs that comprise macroscopic life will be affected in the current wave of extinctions and that microscopic life, which includes most of the diversity of the Earth, will not. In a different twist, Barraclough and Davies (chapter 18) argue that the analytic techniques of phylogenetic reconstruction are at present inadequate to address the processes of future speciation and that even if they could, speciation takes place over such a long period of time that any conceivable management practices would be “wildly impractical.”

If the preceding comments about the content of this book are not sufficient, I suggest that one read the first chapter in which the editors provide their own superb review of each contribution in the volume. At the end of this chapter, the editors interestingly conclude that the impact of phylogenies on conservation indeed may be small. After reading this book I

believe they are correct in their assessment. Nevertheless, there is no doubt that the arguments and evidence presented in *Phylogeny and Conservation* are important, worthwhile, and commendable contributions to both the field of biology and conservation. In the “Century of the Environment” we must apply our entire arsenal of scientific analyses, disciplines, and perspectives to biodiversity conservation. Even if phylogenetics has only a small role to play in conserving species, its impact has been great on the field of biology in that it has untangled the origin and diversification of life. Perhaps the most important role phylogenetic theory and practice can play is to increase our understanding, further our appreciation, and enhance our justification for the sustained conservation of the tree of life in all its wonderful complexity.

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Literature Cited

- Dobzhansky, T. 1973. Nothing in biology makes sense except in the light of evolution. *American Biology Teacher* 35:125-129.
- Hamilton, A., and P. Hamilton. 2006. *Plant conservation: an ecosystem approach*. Earthscan Press, London.
- Krupnick, G. A., and W. J. Kress, editors. 2005. *Plant conservation: a natural history approach*. University of Chicago Press, Chicago.
- Leadlay, E., and S. Jury, editors. 2006. *Taxonomy and plant conservation*. Cambridge University Press, Cambridge, United Kingdom.
- Savolainen, V., M. P. Powell, K. Davis, G. Reeves, and A. Corthals, editors. 2006. *DNA and tissue banking for biodiversity and conservation: theory, practice and uses*. Royal Botanical Garden, Kew, United Kingdom.

Minting Common Currency in Contemporary Sustainability Discourse

The Logic of Sufficiency. Princen, T. 2005. The MIT Press, Cambridge, Massachusetts. 417 pp. (xvi + 401). \$29.00 (paperback). ISBN 0-262-66190-X.

The Logic of Sufficiency by Thomas Princen is a plea to consider limits. Princen believes that an appreciation of limits is missing in our modern economic worldview and that this is a key to understanding how to live more sustainably. Refreshingly, Princen has foregone the simple dichotomies and emotional hype that so often accompanies a generalist discourse on the ecological consequences of economic rationalism. Rather he proposes a framework of “rational pluralism” as a means by which the myriad of complex value structures needed for different circumstances and settings can be contextualized. Princen argues that “no single rationality [should be deemed] superior to another, only better suited to a particular purpose and decision-making setting” (p. 25). A legalistic rationality, for example, may be appropriate in a courtroom and an economic rationality appropriate in a bank. Following the same logic, “ecological rationality” may be most appropriate in the context of human interactions with the Earth’s dynamic and finite ecological systems. Through the lens of rational pluralism, human action and consequence can be decoupled from the assumed and unquestioned goals consistent with short- to midterm profit maximization. We are free to embrace the intuitive truth that there are certain situations when it is actually prudent to make, and abide by, decisions that fail to meet the traditional parameters of economic rationalism, in favor of those that are in tune with ecological and social constraints.

Against this values backdrop, Princen censures the sweepingly pervasive concepts of efficiency and

cooperation as appropriate founding principles of ecological rationality. Although he acknowledges that such principles are culturally intuitive, having evolved to assure the very survival of early human settlements, Princen warns that in a modern context of critical environmental threats and displaced risks and consequences, unfettered interpretations and applications of efficiency and cooperation can serve to undermine sustainability. “As intuitive and popular as these principles are, both suffer from ‘normative neutrality,’” Princen argues. “One can find efficiencies in harvesting a forest so as to save trees just as well as one can find efficiencies to get every last bit of fibre from an acre of timberland. One can cooperate to protect a forest just as well as one can cooperate to clear-cut it” (p.16). Efficiency and cooperation, therefore, as valid and relevant as they can be, are no more than the means by which we may strive to meet defined objectives. And they are certainly not synonymous with sustainability or ecological rationality, simply by merit of being potentially beneficial.

Conversely, Princen alleges that sufficiency is, by definition, congruous with the principles of sustainability and ecological rationality, in that it actively allows for development to be naturally constrained by both biophysical and social limits to growth. Princen proposes that sufficiency, although commonly perceived as being synonymous with *lack* and *sacrifice*, actually has the potential to nourish and replenish on many levels—ecologically, socially, and economically. Recognizing that economic sufficiency could be a hard sell in the Western world, infatuated as we are with economic primacy and maximization, Princen provides numerous case studies of what could be described as “the business case for sufficiency.” Through such proven examples, Princen demonstrates that by respecting natural limits through sufficiency and ecological rationality, business can—and has—invoked

a profitable and *perpetual* financial return on investment. The voluntary simplicity movement has some currency as a lifestyle more in keeping with sustainable use of the world's resources. Princen has tried to show that a similar movement is needed in business.

The Logic of Sufficiency is an important piece of work, and it is imperative that the underlying principles become common currency in contemporary sustainability discourse. As such this book is recommended to sustainability students and educators alike, as well as to policy makers, business folk, and anyone interested in promoting perpetuity—of income, of environmental capital, and of social stability.

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Tribute to Icons of the American Southwest

Biology of Gila Monsters and Beaded Lizards. Beck, D. D. 2005. The University of California Press, Berkeley, California. 247 pp. \$49.95 (hardcover). ISBN 0-520-24357-9.

Considering the vast array of species on this planet, only a small fraction get a well-written comprehensive book dedicated to them. The Gila monster and beaded lizards, however, receive an encore presentation. Bogert and Martín del Campo (1956) set the bar high with their impressive tribute to helodermatid taxonomy, anatomy, ecology, and human dimensions. Nevertheless, complete works become incomplete over time and new discoveries revise our understanding of species. Thus, Dan Beck took on the challenge of rediscover-

ing the Gila monster and beaded lizard.

The Gila monster, *Heloderma suspectum*, and the beaded lizard, *H. horridum*, are the lone extant representatives of a genus deserving of attention. These lizards are the biggest in North America and are the only venomous lizards in the world. History of the American Southwest is dotted with legends about these animals, especially fantastic exaggerations regarding their venom. Early scientific efforts dispelled the folklore, but made bold conclusions based on limited data, resulting in a dogma of questionable accuracy. Nevertheless, the last 20 years have produced a vast array of data-based studies that are shedding light on the truth.

Biology of the Gila Monsters and Beaded lizards opens with a forward by Harry Greene of Cornell University. The choice of Greene is especially appropriate because Beck clearly has been influenced by Greene's (2000) *Snakes: The Evolution of Mystery in Nature*. As Greene does in his work, Beck carefully addresses the biology of these unique lizards with a thorough presentation of what is scientifically known about them and then combines it with a human touch of quotes and anecdotal stories that personalize the book, giving the animals (and the author) a tangible reality, especially to those who have not had the pleasure of encountering one of these animals in the wild.

Beck does a masterful job in basing the book on data that have been collected, not speculation and anecdotal information. Although the text is not free of speculation, it is clear when the author is presenting conclusions based on data versus those based more on his suspicion. Although an author of such a book has the opportunity to selectively "review" the literature, the data presented are complete and the author does not bias his conclusions based on his personal findings compared with those of others. I am included in that list of others who have worked with these

amazing creatures. When I first presented some of my results to Professor Beck, he responded by stating that my results do not agree with what he has seen with his geographically distinct populations. He followed by stating he looked forward to my expansion, and in some ways revision, of what we "know" about helodermatids. This open-mindedness is clear throughout the text.

The first chapter provides the human dimension of helodermatids in an overview of the origin of the names (Latin, English, and, appropriately because of their distribution, Spanish), folklore, and the "evolution" of scientific study of helodermatids. Such a chapter is usually saved for the tail end of such a book, but it fits appropriately at the front because this organization effectively demonstrates the "evolution" of the human-helodermatid relationship. In addition, this opening chapter recognizes the efforts of numerous scientists and the value of the collective product.

Chapter 2 addresses the evolution and distribution of helodermatids, covering both the extant and fossil records. The high-quality tables, figures, and plates make this section a strength. Relatively unique and especially valuable are the plates that provide not simply a single representative of each taxon, but collages of photos for numerous populations that effectively demonstrate the variation (and similarities) within populations.

The next chapter is a thorough, but seemingly misplaced discussion of helodermatid venom and envenomation. The discussion of the venom delivery apparatus is one of only a few places in the book where anatomy is discussed. Although additional information regarding helodermatid anatomy would be valuable, this limitation is more a result of a limited database than the author's failure to compile the existing literature.

The ensuing chapters are the strength of the book and the justification for the need to follow-up on

Bogert and Martín del Campo (1956). These chapters compile recent literature on the ecology, physiology, and behavior of helodermatids. The greatest amount of data exist for the thermobiology of the species, and the author reviews the literature effectively, including numerous graphs from a variety of studies by the author and others. A common thread among the studies is that helodermatids do not tightly control their body temperature and are active at a wide range of temperatures. They avoid activity when it is hot, and thus, although they live in what is considered an extremely hot environment, their activity patterns lead to relatively low active body temperatures compared with that of most lizards.

Energetically, helodermatids also seem paradoxical. They employ an active foraging strategy to locate vertebrate nests, yet use 10% or less of their maintenance budget on activity.

Recently Received Books (November 2006–December 2006)

All Creatures. Naturalists, Collectors, and Biodiversity, 1850–1950. Kohler, R. E. 2006. Princeton University Press, Princeton, NJ. 380 pp. \$35.00 (hardcover). ISBN 0-691-12539-2.

All Things Reconsidered. My Birding Adventures. Peterson, R. T. B. Thomson III, editor. Houghton Mifflin, Boston, MA. 2006. 352 pp. \$30.00 (hardcover). ISBN 0-618-75862-3.

Ecology of Freshwater and Estuarine Wetlands. Batzer, D., and R. R. Sharitz, editors. 2006. University of California Press, Berkeley, CA. 581 pp. (xiii + 568). \$59.95 (hardcover) ISBN 0-520-24777-9.

Ecological Census Techniques. A Handbook. 2nd edition. W. J. Sutherland, editor. 2006. Cambridge University Press, New York,

Nevertheless, these estimates are a result of very low activity levels of particular populations, and the author acknowledges that data from other investigators studying different populations suggest much greater activity and likely much higher energy budgets for activity.

The author uses a similar comprehensive and graphic presentation to describe habitat use, activity patterns, feeding ecology, and reproduction. The book concludes with discussions on conservation issues and future directions. Overall, the author effectively presents the current state of knowledge regarding *Gila monsters* and beaded lizards. The amount of data that have been collected on these species in the last two decades is impressive and well deserving of compilation. The result of Beck's work is a well-written, well-organized, and complete text that makes a major step in the matu-

NY. 447 pp. (xv + 432). \$110.00 (hardcover). ISBN 0-521-84462-2. \$55.00 (paperback). ISBN 0-521-60636-5.

Foundation Papers in Landscape Ecology. Wiens, J. A., M. R. Moss, M. G. Turner, and D. J. Mladenoff. 2006. Columbia University Press, New York, NY. 608 pp. \$45.00 (paperback). ISBN 0-231-12681-6. \$95.00 (hardcover). ISBN 0-231-12680-8.

Galápagos. The Islands That Changed the World. Stewart, P. D., G. Merlen, and P. Morris. 2007. Yale University Press, New Haven, CT. 240 pp. 150 color illustrations. \$29.95 (paperback). ISBN 978-0-300-12230-5.

Globalization and New Geographies of Conservation. Zimmerer, K. S., editor. 2006. The University of Chicago Press, Chicago, IL. 367 pp. (x + 357). \$87.00 (hardcover). ISBN 0-226-98343-9. \$35.00 (paperback). ISBN 0-226-98344-7.

ration of helodermatid information from folklore to speculative anecdotes to data-based conclusions. Although many questions remain unanswered, thanks to Beck (as both an author and a field biologist), there now exists an updated comprehensive resource on the biology of helodermatid lizards—unique and scientifically fascinating creatures.

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Literature Cited

- Bogert, C. M., and R. Martín del Campo. 1956. The Gila monster and its allies. American Museum of Natural History, New York.
Greene, H. 2000. Snakes: the evolution of mystery in nature. University of California Press, Berkeley.

Development Interventions at the Wildlife/Livestock Interface: Implications for Wildlife, Livestock and Human Health. Osofsky, S. A., Cleaveland, S., Karesh, W. B., Kock, M. D., Nyhus, P. J., Starr, L., and A. Yang, editors. 2005. Island Press, Washington, D.C. 253 pp. \$35.00 (paperback). ISBN 2-8317-0864-8.

Infectious Diseases in Primates. Behavior, Ecology, and Evolution. Nunn, C. L., and S. Altizer. 2006. Oxford University Press, New York, NY. 384 pp. £27.50 (paperback). ISBN 0-19-856585-2.

Temperature-Dependent Sex Determination in Vertebrates. Valenzuela, N., and V. A. Lance, editors. 2005. Rowman & Littlefield Publishing, Lanham, MD. 200 pp. \$69.95 (hardcover). ISBN 1-58834-203-4.

Undermining Science. Suppression and Distortion in the Bush Administration. Shulman, S. 2007. University of California Press, Berkeley, CA. 222 pp. \$24.95 (hardcover). ISBN 978-0-520-24702-4.