

erable to report all dates in radiometric years, thus eliminating confusion and also allowing readers the choice of calibration curves for conversion.

The volume includes contributions focusing on extinctions in mammals, birds, molluscs, parasites, plants, and marine organisms. The inclusion of aquatic habitats is particularly relevant given that modern marine communities are in the throes of their own megafaunal extinction. This idea is explored in Chapter 6 (Holocene Extinctions in the Sea) by Dulvy et al., although the discussion is largely restricted to the historical record. However, in Chapter 5 (Past and Future Patterns of Freshwater Mussel Extinctions in North America During the Holocene), Haag takes a deeper temporal perspective and demonstrates that extinction dynamics for freshwater molluscs have increased dramatically in the last century, despite millennia of human harvesting. His startling conclusion is that extinctions resulted from the large-scale systematic destruction of habitat due to dam construction, rather than industrialized and intense large-scale harvesting or even severe water pollution.

Another theme developed in several chapters is the extent to which the late Quaternary record provides the appropriate data for "evidence based conservation" (W. J. Sutherland et al. 2004. *Trends in Ecology and Evolution* 19(6):305-308). Several chapters (i.e., The Past is Another Country: Is Evidence for Prehistoric, Historical, and Present-Day Extinction Really Comparable? by Turvey and Cooper; The Quaternary Fossil Record as a Source of Data for Evidence-Based Conservation: Is the Past the Key to the Future? by Stewart) explore this idea and illustrate cases where inferences drawn from the fossil record may imperfectly reflect species interactions and/or paleocommunity structure and function. This is a bit sobering given that the fossil record for the late Quaternary is as good as it gets.

Overall, this volume represents a valuable contribution to the literature on the late Quaternary and particularly on extinction dynamics. It should be of considerable use to conservation biologists and paleontologists, as well as anyone interested in the historical record of the Earth.

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FROZEN EVOLUTION: OR, THAT'S NOT THE WAY IT IS, MR. DARWIN: A FAREWELL TO SELFISH GENE.

By Jaroslav Flegr; translated by Madeleine Štulíková. Prague (Czech Republic): Charles University in Prague Press. \$20.99 (paper). 225 p.; ill.; index of texts in grey boxes and general index. ISBN: 978-80-86561-73-8. [Originally published as *Zamrzlá evoluce aneb, Je to jinak, pane Darwin*, by Academia, Prague, Czech Republic, 2006.] 2008.

I regard this book review as a public service. Life is much too short to waste it on bad books. So, do not even touch this sloppily written, unprofessionally translated, inadequately conceived, improperly edited, dubiously syntaxed, and horribly pompous and tedious stream-of-consciousness monologue masquerading as a scholarly work. You will save a lot of time reading two articles by Flegr (1998. *Rivista di Biologia* 91(2):291-304; 2010. *Biology Direct* 5:2), not that this statement of fact should be construed as a recommendation that you should. The gist of Flegr's "Frozen Plasticity Model of Evolution" is that sexual species can only evolve when the population is genetically uniform, i.e., "on the edge of extinction for several generations" (Flegr 2010:2). Subsequently, polymorphism may accumulate in the gene pool due to "frequency-dependent selection," at which point the species can no longer evolve; it becomes "evolutionarily frozen on a macroevolutionary time-scale" (Flegr 2010:2) and exists in this state until it becomes extinct. The author regards his theory to be a general one, "which includes the Darwinian model of evolution as a special case" (Flegr 2010:2), applicable only to asexual organisms. Thus, Flegr regards himself as Einstein to Darwin's Newton, with Dawkins playing the role of the clown-sage Richard Feynman.

It is very difficult to pinpoint just one misconstrued scientific issue or one misunderstood evolutionary principle that caused the author to stray and get everything wrong. I believe that his pre-refuted theory has its roots in the 19th-century Galtonian belief that sex destroys everything that is good and advantageous through "blending inheritance" (Flegr 2010:2) or nervous exhaustion and dissatisfaction, depending on the context. Flegr's pre-discredited theory may also have something to do with a lack of even a modicum of understanding of population genetics, the concept of effective population size, molecular evolution, genetic drift, adaptation without positive selection, positive and negative epistasis, and linkage disequilibrium.

What have I learned from the book? First, that it is dangerous to get an honorary doctorate from Charles University in Prague; the Shah got one and was immediately dethroned. Second, that in 2004, half of the journals in the Science Citation Index had an impact factor of less than one and only ten journals had an impact factor greater

than 30. Third, that the Mandelbrot set is a group of elements that belongs to the plane of complex numbers that, even after repeated substitutions into a recurrent equation, does not exceed a value of two. Fourth, that scientists no longer exist; they have been replaced by “research workers.” And finally, that the expression “why take your trousers off when the buckshot is far away?” must sound extremely erudite in Czech.

I have one final piece of advice for those masochists who will imprudently decide against my very strong admonitions to read this book. Have a fun experience by using a “crackpot-index measure” (see e.g., F. J. Gruenberger. 1964. *Science* 145:1413–1415) to compare *Frozen Evolution* against a checklist of the most significant attributes of scientists and quacks. I am looking forward to finding out whether your conclusions will be similar to mine, which I shall keep to myself for the present time.

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SEX ALLOCATION. *Monographs in Population Biology, Volume 44.*

By Stuart A. West. Princeton (New Jersey): Princeton University Press. \$99.50 (hardcover); \$45.00 (paper). xii + 466 p.; ill.; index. ISBN: 978-0-691-08963-8 (hc); 978-0-691-08964-5 (pb). 2009.

The theoretical and empirical study of sex allocation is often touted as one of the great success stories of evolutionary biology. In summarizing several decades of research on the topic, this outstanding volume makes it clear why this is so—the theory has been well developed from first principles, the specific and quantitative predictions from that theory allow for precise empirical testing, and both theory and testing have been exported to a diversity of organisms and interrelated questions. But, at the same time, West clearly and lucidly discusses where the theory has failed, or at least given fuzzy answers, and where the great unanswered questions lie. As such, this book is a “must read” for anyone seriously interested, or even somewhat interested, in the evolution of sex allocation.

After a brief introductory chapter, West properly starts his discussion of theory with Darwin’s early puzzlement and Fisher’s uncanny insight (it is somewhat surprising to see how Darwin’s thinking foreshadowed Fisher’s). West emphasizes, correctly in my view, that Fisher’s theory is best viewed as a null hypothesis, much like the Hardy-Weinberg principle in population genetics, in that it gives the condition (equal investment in each sex) that will occur under a set of simplifying assumptions; in most cases these simplifying assumptions will not hold and we actual expect differ-

ential investment (e.g., sons over daughters or vice versa). Accordingly, Fisher’s theory is not something that can be easily tested, and is not an alternative to other hypotheses, but rather is the fundamental basis for the rest of sex allocation theory.

After this basic groundwork is laid, West moves through a number of chapters that explore, both in theory and empirical tests of that theory, the many ways that differential investment can arise through violation of the simplifying assumptions underlying Fisher’s argument. He explores the effects of interactions among relatives (both cooperative and competitive), the differential effects of environment on male and female fitness, sex change and simultaneous hermaphrodites, the consequences of overlapping generations and, finally, conflict between individuals/genes (e.g., sex-ratio distorters). Throughout, West covers work on a diverse array of taxa with varying forms of sex determination, and also gives solid discussions of broad conclusions and future directions for research.

The volume concludes with what I found to be the broadest and most interesting chapter: a discussion of the implications and general lessons gained from the study of sex allocation research. In this broad-ranging chapter, the author covers insights to basic evolutionary principles (inclusive fitness, levels of selection, constraints on adaptation, and how to test evolutionary theory), the application of sex allocation theory to conservation biology and biomedicine, and a review of the “major outstanding problems” in our understanding of sex allocation. By the end of this chapter, West has built a compelling case that sex allocation theory is truly a success story, but also a fruitful area for continued research.

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SPERM BIOLOGY: AN EVOLUTIONARY PERSPECTIVE.

Edited by Tim R. Birkhead, David J. Hosken, and Scott Pitnick. Amsterdam and Boston (Massachusetts): Elsevier. Academic Press. \$79.95. xxxii + 642 p. + 11 pl.; ill.; index. ISBN: 978-0-12-372568-4. 2009.

I confess to requesting the opportunity to review this much-needed anthology. When I recently published on insect sperm storage, I searched for relevant scientific literature, only finding a prominent “post Goeff Parker” gap (see page 33 of the book under review here). In fact, in that 2009 *D.I.S.* publication, I requested input and assistance—although an author, I asked questions. So it is with delight that I announce that a copy of *Sperm Biology* sits on my desk. It is well put together,