

HUMAN ONSLAUGHT IN MADAGASCAR

AARON M. ELLISON

*Department of Biological Sciences, Mount Holyoke College
South Hadley, Massachusetts 01075-6418 USA*

A review of

NATURAL CHANGE AND HUMAN IMPACT IN MADAGASCAR. *Symposium held in Chicago, Illinois, 2-4 June 1995.*

Edited by Steven M Goodman and Bruce D Patterson. Washington (DC): Smithsonian Institution Press. \$75.00 (hardcover); \$35.00 (paper). xiii + 432 p; ill.; index. ISBN: 1-56098-682-4 (hc); 1-56098-683-2 (pb). 1997.

This volume presents all but one of the invited presentations at the 18th annual Spring Systematics Symposium of the Chicago Field Museum. One intent of the symposium (and this book) was to revisit and update topics first synthesized in the 1972 publication, *Biogeography and Ecology in Madagascar* (R Battistini and G Richard-Vindard, editors. The Hague: Junk), and to present advances in those areas of inquiry. The other intent was to make a revisionist assessment of the interactions between natural and anthropogenic processes that bear on conservation and management of Madagascar's unique biota. This book largely succeeds in the latter intent, but mostly fails in the former. A somewhat more complete topical coverage is available in the published abstracts (in English and Malagasy) of the contributed papers from the symposium: *Environmental Change in Madagascar*, edited by B D Patterson et al. 1995. Chicago (IL): The Field Museum). Despite its flaws, *Natural Change and Human Impact in Madagascar* provides a valuable (and affordable) perspective on the current state of conservation and biodiversity in Madagascar.

The overriding goal of this book is to highlight revisionist perspectives on environmental change in Madagascar. This island's predominantly endemic biota and its precarious state in the face of a rapidly expanding population and apparently degraded landscape gained world attention in the mid-1970s. International nongovernmental organizations and lending authorities (such as the World Bank) subsequently directed personnel and large amounts of money toward the conservation and preservation of Madagascar's charismatic megafauna and flora (such as lemurs and orchids). These efforts proceeded from the assumption that the nonhuman biota had to be protected from the assaults of the Malagasy people. Virtually every chapter maintains that this perspective has been one-sided and misguided; many of the threats to Madagascar's biota stem from dynamic, natural processes

that might have been, or continue to be, only amplified by anthropogenic activity.

The book is divided into five sections: Paleoenvironment (3 chapters); Biota (3 chapters); Extinctions and Degradation (4 chapters); Human Effects (4 chapters); The Future of Biodiversity (2 chapters). The authors are a healthy mix of Malagasy, French, South African and U.S. scientists. I found the chapters on paleoenvironments the most rewarding and convincing of the revisionist theme. Krause et al. present a thoroughly up-to-date reconstruction of the positions of Madagascar since its Jurassic precontinental drift location adjacent to modern-day Somalia. Their data, and others presented throughout the first two sections, strongly argue for a predominantly African origin for Madagascar's biota. Burney reviews a decade of Holocene climate reconstructions. He puts forward a convincing case that through the Holocene, Madagascar's climate and vegetation have been very dynamic; closed-canopy tropical wet forest did not completely cover the island, and humans colonized Madagascar during a particularly dry period approximately 2000 years ago. This apparently rapid aridification and the concomitant vegetation shifts could have led to the demonstrably nonrandom extinction of the large lemurs (body mass 10–200 kg) discussed in a later chapter by Godfrey et al. Wells and Andriamihaja document that the extreme gully erosion characteristic of the modern landscape is exacerbated by anthropogenic activities, but is not necessarily started by humans. This chapter, however, like many others in the volume, reads more like a plea to consider human actions as simply extenuating circumstances that aggravate otherwise primarily natural processes. In other words, the now-extinct fauna (e.g., megalemurs, elephant birds, pygmy hippopotamus) were on their way out anyway, and humans were probably not to blame. By extension, therefore, human impacts on extant flora and fauna are overrated.

The sections on biota and extinction focus on vegetation, reptiles, lemurs (2 chapters), and birds (2 chapters). Raxworthy and Nussbaum thoroughly review the biogeography of the endemic reptiles (40% of the endemic vertebrates are reptiles, and 95% of the reptiles are endemics) and show quantitatively that their patterns of distribution are not concordant with current vegetation/habitat distribution. Lowry et al. review and strongly critique the historical attempts to map the vegetation of Mada-

gascar, but except for suggesting a chorological approach (a term likely to be unfamiliar to most readers not trained in continental European phytosociology, and poorly defined by the authors), they provide no real alternatives. Simons provides current coverage of lemur distribution and, in the least revisionist conclusion of the book, asserts that we all participate in the tragedy of species extinction when we “fail to oppose economists or traditionalists who argue either that unlimited growth and development are good or that the world was made only to be exploited by mankind” (p 163). The implication of data presented in many of the other chapters, although not usually the conclusion of their authors, is that even limited growth and development in Madagascar may undermine an already fragile situation. There is no discussion anywhere of country-wide biodiversity of any other group, despite astonishingly high endemism in fish and amphibians (data on page 281). The lack of attention to nonvertebrates in the book, particularly arthropods and plants, is inexplicable except in the context of conservationists’ preoccupation with charismatic megafauna.

The authors of the four chapters in the section on human effects take the most strongly revisionist stance; interestingly, this section is dominated by Malagasy authors. The principal conclusions from these chapters are: (1) the incomplete fossil and archeological records will make it difficult to ever decide if humans bear any responsibility at all for the extinction of Madagascar’s lost or endangered species (Dewar), and (2) the current disequilibrium between humans and their environment is part of the normal process of social evolution (Rakotoarisoa). The latter author also suggests (pp 339–340) that the lack of legal institutionalization of distribution of Madagascar’s finite resources and the hegemonic exercise of power by undemocratic authorities (supported by technical experts and financial institutions in the developed world) maintains this disequilibrium. While all the authors in this section generally assert that, lacking better data, we are better off concluding that human impacts have been less strong than previously thought, they do not present a convincing case that such impacts likely will continue to be small. Interactions between humans and the biota elsewhere in the world’s tropical and subtropical regions generally fail to support this conclusion, and there are no compelling reasons presented that Madagascar should be a special case. In contrast, MacPhee and Marx present a “hyperdisease” hypothesis that could explain the apparently long lag time between human colonization of Madagascar and the extinction of many (especially large) animals, given the absence of evidence for mass hunting. Their hypothesis may be extendable to other re-

gions of the world that experienced so-called First Contact extinctions (when humans first colonized an area), but they forthrightly acknowledge that gathering supporting data will be difficult.

The two concluding chapters on the future of Madagascar’s biodiversity, along with the chapter on forest fragmentation and loss of resident avifauna (in the section on extinctions) try to put the last decade’s conservation efforts and their future prospects in the best light possible. Both Wright in her chapter, and Richard and O’Connor in theirs, emphasize that successful conservation projects (especially ones that attempt to integrate conservation and development) do not happen overnight, or even after more than 10 years of work. Their efforts, and those of others, both Malagasy and foreign (*contra* Rakotoarisoa), are to be applauded and should be supported for the long term. Population and development pressures, however, do not leave much room for error. For example, the “success” of the Ranomafana National Park integrated conservation and development plan has led to a literal population explosion: Wright reports that from 1957–1987 the region’s population grew 111% (from 5,072 to 10,723 people; p 390), and by 1995 (4 years after the establishment of the park) the park’s 3-km wide peripheral zone alone had 25,000 people (a further 150% increase; p 386)! It is a massive understatement that “tourism can be a problem” (p 396) for this region, and that the park’s infrastructure is inadequate to handle increased traffic.

Despite Richard and O’Connor’s attempt to distinguish between human degradation and transformation of a landscape (the latter having broader economic scope and fewer negative connotations), Jolly’s 1989 conclusion, quoted on page 411, that “Madagascar is rapidly heading to a confrontation between the human population and the supply of fuel and food, with fuel running out first” is not refuted by the data presented in their chapter or elsewhere in the book. With a 1985 population growth rate of 3.0%, a projected (by 2015) growth rate of between 1.5 and 3.5%, and a projected (by 2015) 15–25 fold increase in population density per square kilometer of arable land (all 1987 World Bank data reprinted on p 411), the likelihood of further landscape degradation and biotic impoverishment on Madagascar appears unstoppable. Changes in the language of conservation and development projects, and revisionist history based on limited data, are unlikely to stop the human onslaught on what remains of one of the Earth’s greatest living treasures. Richard and O’Connor view the prospects as far from grim, despite huge difficulties and great problems in need of unending struggle (p 417). The authors and editors of this book all support that struggle, as should the rest of the world.