

## ECOLOGY

# Biohistory of the Mascarenes

Storrs L. Olson

The dodo of Mauritius, *Raphus cucullatus*, (last unequivocally recorded in 1662) is an icon of human-caused extinctions on islands. On the neighboring island of Rodrigues, the related solitaire, *Pezophaps solitaria*, soon followed the dodo into extinction. Modern studies of DNA extracted from their remains suggest that these large, flightless birds were derived independently from the nomadic Nicobar pigeon, *Caloenas nicobarica*, of Australasia. Only a decade ago it was realized from newly discovered bones that the supposed dodolike “Réunion solitaire” (now *Threskiornis solitarius*) was actually derived from the sacred ibis, *T. aethiopicus*, and that the misinterpreted accounts of 17th-century voyagers applied much better to an ibis than to a dodo. Réunion may possibly have had a dodolike bird, but geologists now understand that the island underwent a cataclysmic volcanic upheaval about 200,000 years ago that probably wiped out many terrestrial organisms, so that much of the biota must be younger than that of the other two Mascarene islands.

These are just a few examples of the advances in knowledge of the Mascarene biota brought together in *Lost Land of the Dodo*, which is both timely and an indispensable reference. Anthony Cheke has over three decades’ experience in research and conservation in the Mascarenes and is responsible for the bulk of the volume. Julian Hume, who has long been interested in extinction on islands, has conducted recent paleontological research in the Mascarenes and contributes an appendix on that subject, boxed accounts of the different groups of Mascarene vertebrates, and illustrations.

The book’s principal focus is on terrestrial vertebrates, with emphasis also on botany, ecology, and conservation. Unlike Pacific islands, for example, where recent discoveries of past biodiversity have come entirely from the fossil record, the Mascarenes had no period of prehistoric human occupation and were essen-

tially in pristine condition when discovered in the 16th century. Thus the accounts of early European explorers and settlers take on greater importance than on islands subjected to cen-

## Lost Land of the Dodo

by Anthony Cheke and Julian Hume

Yale University Press,  
New Haven, CT, 2008.  
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turies of prehistoric human intervention. Much new material has emerged in the past few years through the combing of old archives and through new paleontological discoveries. The systematic relationships of Mascarene organisms have now been augmented by recent DNA studies, and modern conservation techniques have met with both successes and

disappointments in attempts to save the remnants of fauna and flora that have survived over 500 years of human devastation and neglect.

The three Mascarene islands have very different geological, biological, and human histories. This disparity is part of what contributes to the book’s organizational problems.

The chapters are arranged more or less as a chronological progression, with each chapter having separate sections devoted to the individual islands. Information on particular topics, such as bats or lizards, is scattered among the various chapters without any final syntheses. The abundant illustrations include color plates with 39 of Hume’s always-evocative paintings of extinct organisms as they may have looked in life.

The volume’s utility is severely compromised by the gross overuse of endnotes in an attempt to produce a “text unencumbered by endless ‘Harvard references’ and explanatory byways.” Some of the notes simply provide an author and year so that one must then turn to the bibliography, but most are extensive discourses that cannot very well be read outside the context of the main text. All but 3 of the 15 appendices have their own sets of endnotes. After flipping back and forth through the first two chapters, I became exasperated, cut the book apart, and removed the 90 pages of endnotes so they could be more easily consulted. The book is sturdily bound, however, and the separate parts have held together well. As examples of excess, a little over three columns of text concerning dodos shipped alive from Mauritius is accompanied by five columns of endnotes in smaller type; chapters on the Mascarenes in the 19th and 20th centuries have 389 and 498 endnotes, respectively. To make matters worse, the endnotes are not indexed.

Many of the topics that I attempted to find were not included in the index. Maps are not indexed as such and can only be located by flipping pages. (Mauritius and Réunion are shown in many different maps, but I only found one of Rodrigues.) The extinct fruitbat (*Pteropus subniger*) referred to as “rougette,” a name revived for the book, is indexed under that “long vanished” vernacular, which is of no help whatsoever as the species is not listed at all under “bat.” The absence of a comprehensive index is a great impediment in a work so crammed with widely scattered facts.

Despite the mistaken attempt to make the book read like something else,



**Not so dodolike.** Réunion ibises (last recorded circa 1710) on the slopes of the Piton des Neiges volcano.

The reviewer is in the Division of Birds, National Museum of Natural History, Smithsonian Institution, Washington, DC 20013-7012, USA. E-mail: olsons@si.edu

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*Lost Land of the Dodo* is a scientific reference work that will long be essential to anyone studying evolution and conservation of insular organisms. Unfortunately, it also serves as a model for how such volumes should not be organized, and it will prove very difficult to use unless eventually made available as a searchable electronic text.

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## CULTURAL EVOLUTION

# Bridging the Big Gap

Asif A. Ghazanfar

Histories are full of gaps. Whether these are apparent (reflecting a lack of data) or real (nothing of import actually occurred) is often an open question. Nevertheless, there is a tendency to develop theories that suggest the latter and thereby explain away our lack of knowledge. For example, the classic historical paradigm of a period of intellectual stasis between the philosophical contributions of the ancient Greeks and their rediscovery in the Middle Ages ignores seminal works of Arab-Muslim scholars (1). But perhaps the most important gap in human history is actually more an abyss—our “prehistory.” It is into this abyss that Daniel Lord Smail, a historian at Harvard University, journeys in hopes of finding links between Stone Age and Modern people.

*On Deep History and the Brain* maps his voyage. In it, Smail shows where we are with respect to understanding humanity’s history, how we got here, and the general direction toward which we should move. He offers two key lines of argument. One illustrates how past and current ways of thinking about human history are based on misguided notions of what counts as history. The second provides a unifying framework for a cultural history that incorporates evolutionary biology and neuroscience.

In essence, “prehistory” refers to the thousands of years before civilization, when history supposedly did not move. Historians came to such an idea through a mixture of ignorance and practicality. Into the 19th century, European historians turned to the Book of Genesis; later scholars, forced to reckon with deep geological time and evolution by natural selection, were more creative. The spirit of their arguments for ignoring deep his-

tory is reflected in a sentence Smail quotes from the historian Mott Green: “At some point a leap took place, a mutation, an explosion of creative power—the ‘discovery of mind,’ or the ‘birth of self-consciousness’—interposing a barrier between us and our previous brute, merely biological existence” (2). The essential idea is that history in the proper sense began when cultural evolution eclipsed biological evolution. Furthermore, cultural evolution is Lamarckian (directed progress toward a goal) and thus obviates the need to incorporate Darwinian explanations and lessens the importance of our biological history.

The idea that recent history follows an accelerating Lamarckian pattern is pervasive among historians and even endorsed by the late paleontologist Stephen Jay Gould: “Cultural evolution has progressed at rates that Darwinian processes cannot begin to approach.... Human cultural evolution ... is Lamarckian in character” (3). Smail tempers this idea by demonstrating that often apparent directed and accelerated progress is actually an illusion of teleology. First, many cultural paradigms are the result of trial and error or the inadvertent consequence of a sequence of actions. Second, the accelerated nature of cultural evolution does not preclude Darwinian mechanisms (selection based on random events); in fact, the short generation time (sharing an idea with other people multiples it within a short period) creates the illusion of directed progress. Smail concludes that humanity’s deep history has no particular beginning and is driving toward no particular end.

For Smail’s unifying framework, the crux of his synthesis is that culture is made possible by the plasticity of human neurobiology. Civilization—with its attendant agriculture, animal domestication, abandonment of migration, and increasing density of human settlements—Smail holds, did not bring an end to the role of biology in human history. Rather, civilization brought rapid changes in human behaviors and created new neurophysiological ecosystems in which different brain-body states could evolve (molded by different cultures). These brain-body states have their roots in our primate and other vertebrate ancestors. Thus, in essence, any culture represents the dynamic interactions between the brain, body, and environment of humans within a particular group. Smail presents an embodied and situated view of human history.

How do culture and neurophysiology influence each other? One example that Smail elaborates, and that has a direct link to our primate ancestors, is the dominance hierarchy. The social emotions associated with dominance hierarchies (e.g., anger, fear, contempt, and pity) are in large part mediated by the autonomic nervous system and often revealed involuntarily by our facial expressions. These have deep phylogenetic roots. Although the neural responses may not have changed much across time, the means by, and contexts in, which dominance and submission are felt and exploited by people in a society are culturally specific. More generally (and without our being aware of it), emotional and physiological ups and downs are exploited in different ways in different cultures—for pleasure, for inflicting harm, etc.—through different associations. Smail dubs the varying forms of culturally specific instruments that drive brain-body responses “psychotropic mechanisms.” These include mood-altering practices, behaviors and institutions generated by human culture, foods like coffee and chocolate,

our interactions with others through social hierarchies or religions, and self-stimulation through novels or roller coasters. Importantly, the exploitation of brain-body states by cultures is not intentional nor does it have a goal.

*On Deep History and the Brain* is a small book with big ideas: that human history is linked in deep time by the physiological mechanisms that we share with our vertebrate ancestors and that the historical “progress” and “acceleration” we detect are in fact directionless series of ongoing culturally specific experiments with psychotropic mechanisms. Smail deftly and impressively pulls together information from the disparate fields of cultural history, evolutionary biology, and neuroscience. His knowledge and sophistication are most evident when he avoids the traps and numerous inadequacies of evolutionary psychology; he cogently adopts a developmental systems-embodied cognition view of behavioral biology for his historical framework. A creative and compelling synthesis of ideas, Smail’s book provides an engaging and invigorating analysis of our history.

### References

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2. M. T. Greene, *Natural Knowledge in Preclassical Antiquity* (Johns Hopkins Univ. Press, Baltimore, MD, 1992).
3. S. J. Gould, *The Panda’s Thumb: More Reflections in Natural History* (Norton, New York, 1992).

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### On Deep History and the Brain

by Daniel Lord Smail

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The reviewer is in the Neuroscience Institute and Department of Psychology, Princeton University, Princeton, NJ 08540, USA. E-mail: asifg@princeton.edu