tions, selection can act both at the level of defining those cells that will form gametes and at the level of the haploid generation. This may imply that the evolutionary strategies used by plants and animals differ considerably.

Although much of this vast area of research remains to be explored, *Developmental Genetics and Plant Evolution* brings together a variety of approaches and systems where we are beginning to glean some of the answers. As with any multi-author volume, the text is somewhat uneven; some chapters are thought-provoking, and others fairly superficial. Nonetheless, the book does a good job in highlighting the evo-devo potential of many plant systems. Such research will help us determine how changes in developmental pathways have resulted in the diversity of plant forms we see around us today.

References

1. J. Doebley, L. Lukens, *Plant Cell* **10**, 1075 (1998).
2. S. B. Carroll, J. K. Grenier, S. D. Weatherbee, *From DNA to Diversity: Molecular Genetics and the Evolution of Animal Design* (Blackwell Science, Malden, MA, 2001).
3. E. H. Davidson, *Genomic Regulatory Systems: Development and Evolution* (Academic Press, San Diego, CA, 2001).

BOOKS: PALEONTOLOGY

Everything You Want to Know and Moa

David W. Steadman

Welcome to New Zealand, where much of the biodiversity crisis is over. People won; native plants and animals lost. In this regard, New Zealand is not alone among oceanic islands. What sets this isolated, partly Gondwanan archipelago apart is its great variety of flightless birds, which includes two endemic orders. Before Polynesians arrived, New Zealand had at least 38 species of birds that could not fly (11 moas, 5 kiwis, 6 ducks and geese, 2 adzebills, 11 rails, a parrot, and 2 passerines). Of these, 29 are now extinct, and most of the 9 survivors are endangered. They and the other indigenous birds are the focus of Trevor Worthy and Richard Holdaway's *The Lost World of the Moa*. The volume is the first book-length paleontological treatment of New Zealand's terrestrial vertebrate fauna, whose native non-bird component consists only of frogs, skinks, geckos, tuatara, and bats. Although the phrase "lost world" sounds a little hokey and might suggest a movie in which people interact with dinosaurs, New Zealand sustained until recently a fauna that would seem fictional if not for the abundant bones it left behind.

The Lost World of the Moa
Prehistoric Life of New Zealand
by Trevor H. Worthy and Richard N. Holdaway
Indiana University Press, Bloomington, IN, 2002. 755 pp. $89.95. ISBN 0-253-34034-9.

The author is at the Florida Museum of Natural History, Post Office Box 117800, University of Florida, Gainesville, FL 32611, USA. E-mail: steadman@flmnh.ufl.edu

Image not available for online use.

Predator and prey. Haast's eagles (right skull) apparently fed on terrestrial birds as large as the giant moa, *Dinornis giganteus* (with a body mass of 200 kg or more).

Any faunal perspective other than paleontological is bound to be limited in New Zealand and its satellite islands. There the "human bolide" (to borrow from Paul Martin) has wiped out about half (70 of 145) of the native species of landbirds over the past millennium or two, with most of the losses occurring before the additionally damaging last two centuries of European influence. Many of New Zealand's surviving landbirds, whether volant or flightless, persist in small populations that occupy only a fraction of their former range. Data reported by Worthy and Holdaway are important to biologists who would like to know the natural distributions and habitat preferences of species in order to set conservation goals.

I love this book, in spite of the criticism I will offer. The authors, independent but prolific New Zealand paleontologists, devote nearly 200 pages to the 11 species of large flightless birds known as moas (Dinornithiformes). They exhaustively cover such topics as morphology, systematics, geographic distribution, extinction, and the history of moa studies. The systematics section is a little compromised by inconsistent use of "ratite" (a sternum without a keel) and "paleognathous" (a configuration of the palate). Although I am not a moaphile, I was glued to my chair while reading Worthy and Holdaway's impressive account of these most famous of New Zealand's birds. On the other hand, their coverage of the immense, extinct Haast's eagle (*Harpagornis moorei*) consumes 90 rather tedious pages, with 30 pages alone devoted to overly precise estimates of its body mass.

This exhaustive coverage of *Harpagornis* is part of the author's highly uneven, "bigger is better" treatment of taxa. The 78 species of snipes, plovers, pigeons, parrots, cuckoos, and passerines—mostly endemic species in endemic genera—are covered in only 28 pages. The 100 currently or formerly resident species of seabirds also get limited press. Whereas no less than 90 photographs or illustrations depict moas, most other avian species (and even genera) are not depicted at all. I would love to see, for example, skeletons of flightless passerines (the acanthisittid wrens *Dendroscansor decurvirostris* and *Pachyplichas yaldwyni*).

The authors provide few comparisons with faunas outside of New Zealand. Although this kiwi-centric approach is to some extent forgivable, biogeographers will be further disappointed that Worthy and Holdaway do not interpret their data in the context of models comparing species richness with land area, elevation, or isolation. They do, however, discuss faunal turnover. Here they teach what may be the most important biogeographic lesson in their and many other fossil-based studies: the species compositions of insular vertebrate faunas have been stable rather than dynamic for more than 100,000 years, cruising unscathed through glacial-interglacial cycles. Large-scale change occurs only when people arrive. Worthy and Holdaway emphatically state, "Indeed, all the species of vertebrate known from New Zealand in the past 100,000 years survived to within the past 2000 years."

On every Pacific island group with a relatively long fossil record (whether Tonga, the Hawaiian Islands, the Galápagos, or New Zealand), the evidence points to pre-human faunal turnover rates at least several orders of magnitude slower than those proposed by ecologists. This finding is not just an artifact of census interval; pre-human colonization and extinction truly were exceedingly rare. Except perhaps for rails, there was no Brownian movement of potential avian propagules to inoculate island avifaunas, nor were the changes in climate and sea-level sufficient to drive extinction. Although concepts of

CREDIT: ROD MORRIS/COURTESY INDIANA UNIVERSITY PRESS

faunal turnover might apply to undifferentiated faunas on islands near rich continental source areas, they have little relevance for the distinctive faunas of true oceanic islands.

The authors finish their text with a chapter on extinction that, though informative, suffers from an inadequate cultural context. How do "early" archaeological sites (with moa bones) differ from ones without moa bones in terms of stratigraphy, chronology, artifacts, and entire (bird and non-bird) faunal assemblages? One wishes for more evidence to support the authors' claim that rats arrived in New Zealand about 2000 years ago (presumably from transient human visitors), whereas permanent Polynesian settlement began only 700 to 800 years ago. Such evidence would bolster their proposed extinction chronology for moas, which I believe will remain tentative until they or others undertake a vigorous program of radiocarbon-dating individual moa bones.

Worthy and Holdaway admit that "being private researchers, we have had academic freedom without the overheads [i.e., administration] and teaching load that come with a university career." Though the teaching part is debatable, I know of few university-based paleontologists or organismal biologists who do not feel that their institutional infrastructure is becoming increasingly cumbersome. (Just reading and responding to in-house e-mail messages can consume hours each day.) Regardless of our precise interests, how all we island biologists wish that we could unplug and—for just a year or two—take a time machine back to the New Zealand of 2000 years ago, before rats and people took over. Simply learning the basics about plumage, behavior, and ecology of moas and other extinct birds would put flesh on the bones that Worthy and Holdaway have described so well. *Lost World of the Moa* is a landmark book that will always be at my fingertips.

BROWSINGS

The Lunar Men. Five Friends Whose Curiosity Changed the World. *Jenny Uglow.* Farrar, Straus and Giroux, New York, 2002. 608 pp. $30, £25. ISBN 0-374-19440-8.

Canals, china, the chemistry of gasses, and the classification of British plants were among the diverse interests of a small group of amateur experimenters who formed the Lunar Society of Birmingham in the 1760s. The loose club, which met when the full moon provided light for the journey home, included Erasmus Darwin, physician, poet, and evolutionary theorist; Josiah Wedgwood, potter; James Watt, developer of the steam engine; and Joseph Priestley, discoverer of oxygen. They and the other members shared a desire to improve industry and commerce through science. Most of the group considered themselves free thinkers, believed in moral and material progress guided by rationality, and supported the American and French revolutions. Building on numerous previous studies, Uglow uses the extensive collections of the members' letters to craft a detailed and vivid group biography. She highlights the relations among the men and their worlds, and suggests their importance to both the Romantic writers and the Industrial Revolution.

Searching for Steinbeck's Sea of Cortez. A Makeshift Expedition Along Baja's Desert Coast. *Andromeda Romano-Lax.* Sasquatch, Seattle, WA, 2002. 272 pp. Paper, $16.95. ISBN 1-57061-255-2.

In the spring of 1940, novelist John Steinbeck and marine biologist Edward Ricketts spent six weeks collecting organisms along the shores of the Gulf of California. Inspired by Steinbeck's classic *Log from the Sea of Cortez*, Romano-Lax and her family traveled by sailboat, kayak, and car to retrace that trip. Romano-Lax blends ecology, philosophy, and adventure in an account that describes her encounters with animals ranging from sea cucumbers to gray whales as well as her impressions of the changes the past 60 years have brought to the Gulf and the people who live along its shores.

NOTA BENE: HISTORY OF SCIENCE

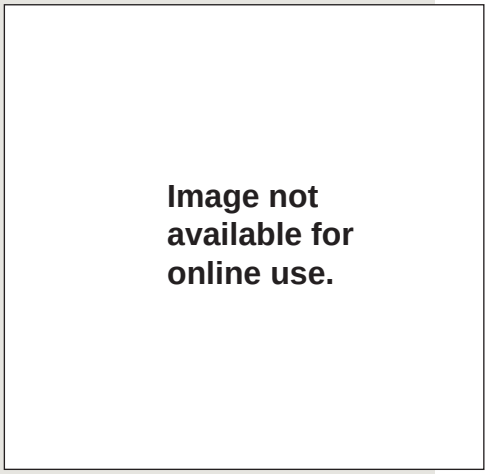
The Scuttlebutt on Science

In *Eurekas and Euphorias*, Walter Gratzer notes that there are literary and historical compilations of anecdotes "without number." The book, then, is Gratzer's contribution to help rectify the balance in favor of science, for which such stories "exist only in the tribal consciousness." (Although, given the numerous sources quoted in the book, this claim is perhaps a little exaggerated.)

Eurekas and Euphorias
The Oxford Book of Scientific Anecdotes
by Walter Gratzer
Oxford University Press, New York, 2002. 311 pp. $28, £16.99. ISBN 0-19-280403-0.

The book's 181 short sections present a wide range of anecdotes about the great and the not-so-good in science. The stories include classics such as Kekulé's penchant for dozing, the N-ray travesty, Primo Levi's internment in Auschwitz, and the race to discover the structure of DNA. Lesser-known tales are retold, too: of the sinus infection that yielded the α-helix, of the mathematician and murderer André Bloch, and of the accidental discovery of aspartame.

There are, however, dangers inherent in the genre. One is that the nature of the form (a diverting tidbit) might be considered as trivializing or, worse, misrepresenting its subject. A second is the ever-present peril of embellishment, acknowledged in several of the accounts. But the great aplomb with which Gratzer delivers these stories should soften the heart of even the most unforgiving reader. A third, rather more prosaic, problem with such collections is indigestion. Reading a great many of the stories in a row is a bit like eating as many chocolates: the pleasure starts to wane after a while. Clearly, though, the intention is that the reader should dip into the book.



Character-sketches of scientists.

Readers will find few deep revelations or poignant moments, but there are a good many belly laughs to be had. (Perhaps the best being over the issue of William Buckland's unusual eating forays, which apparently included the embalmed heart of France's Louis XVI.) Through all this merriment, Gratzer is at pains to keep the explanations of the science plain and clear, an approach that indicates a target audience including both scientists and non-scientists. *Eurekas and Euphorias*, thus, could be a perfect stocking filler for all those interested in the scuttlebutt on science.

—GUY RIDDIHOUGH

CREDIT: VICTOR JUHASZ/COURTESY OXFORD UNIVERSITY PRESS