

Publications

Synthetic Aesthetics: Investigating Synthetic Biology's Designs on Nature edited by A.D. Ginsberg, J. Calvert, P. Schyfter, A. Elfick and D. Endy (2014), xxii + 349 pp., The MIT Press, Cambridge, USA. ISBN 978-0-262-01999-6 (hbk), USD 34.95 GBP 24.95.

The role art has played in conservation is little appreciated by today's practising conservation community. From the Romantic poems of Samuel Taylor Coleridge and William Wordsworth and the Hudson River School paintings of Thomas Cole and Frederic Edwin Church to the photographs of Ansel Adams, the arts have served to stir public appreciation of nature and sometimes move it towards conservation.

This big, ungainly, beautifully produced book is not designed to affect conservation, yet it should do just that. Assembled by artists, designers, social scientists and synthetic biologists, *Synthetic Aesthetics* aims to provoke discussion about what place, if any, design should have in our relationship to living things. It aims to stimulate the reader to consider what responsibilities accrue to those designing biology and to the larger society.

The focus is on synthetic biology, an emerging discipline that is poorly known amongst conservationists. There is no universally agreed definition of synthetic biology but it can be understood as a broad and fast-moving field of innovation involving the design and construction of new biological parts, and the redesign of existing, natural biological systems, to produce goods and services of use to humans. Advocates of synthetic biology claim that these new technologies will provide sustainable solutions to our manufacturing and energy needs. Its detractors claim that deployment of organisms altered through synthetic biology will only increase the negative impacts that humans are already having on the natural world. Irrespective of these concerns, billions of euros, dollars and yuan are being spent on developing and deploying synthetic biology.

The editors ask disruptive questions to stimulate the reader to think more deeply about synthetic biology. They wish to generate 'discussion about synthetic biology, its aims, and its potential implications, using art, design and social science to transcend the narrow and one-dimensional way in which it is starting to be framed in order to stimulate more improbable and creative thinking' and to 'increase the range of possibilities and future trajectories for technological development and to promote better outcomes—with the recognition that what is meant by "better"

is something that must be actively and continually debated.'

The book presents the results of an exercise that paired designers/artists and synthetic biologists working in Europe, Asia, Australia, South America and the USA. The pairs worked over extended periods to identify where and how their two disciplines could collaborate, and some of the collaborations—many designed but not executed—are thought-provoking. A great deal of the material will be new to people in our field, and my suggestion is to browse through the text and pay careful attention to the many illustrations.

The first part of the book contains a valuable introduction to synthetic biology and a thoughtful chapter on the role of design in human affairs and in biology. Part two looks at nature and design from the perspectives of three diverse disciplines, and part three presents six case studies drawn from the collaborations, interwoven in a set of cross-cutting chapters. The result is fascinating but could have benefited from a sharp editorial pen to shorten and tighten the contributions.

The editors contend that biotechnology will be the foremost driver of change in the 21st century, and 'synthetic biologists believe that their work will be integral to the success of this envisioned "Biotechnology Revolution" through the intentional design (or redesign) of biology.' They argue that synthetic biologists are open to collaborations such as those described because of the newness of the field. This, together with the potential harm and/or good that synthetic biology could do to biodiversity makes this an important book for conservationists to consider.

The book raises numerous issues that may have significant impact on our field and our cause: If it is made by humans is it biodiversity, and within our scope of responsibility? What will happen when human synthesis of DNA means we no longer have to rely only on those 'parts' offered to us by nature? What will happen when biology becomes a fully executable programming language? What will it mean when biology becomes the ultimate distributed manufacturing platform?

Synthetic Aesthetics reminds us of the valuable role that artists can play in pushing the limits of discourse—creating and mapping value spaces before they are occupied. Synthetic biology may become the most important threat to the natural world and its human inhabitants, or the most important man-made solution humans have developed to the problems we have created. Or it may be both. It is our responsibility to engage

with the practice of synthetic biology to try to ensure that the field is committed to positive biodiversity values.

KENT H. REDFORD *Archipelago Consulting, Portland, Maine, USA*
E-mail redfordkh@gmail.com

The Word Hunt: An Environmental History of the Commodification of Animals

John F. Richards (2014), xix + 161 pp., University of California Press, Berkeley, USA. ISBN 978-0-520-28253-7 (pbk), USD 24.95 GBP 16.95.

The first thing that must be noted is that this is not a 2014 title, despite the publication date, but a reprinting of a selection of chapters from Richards' 2003 opus, *The Unending Frontier: An Environmental History of the Early Modern World*. In 2003 the scope and imagination that marked Richards' book was path-breaking but in 2014 the ground has been much better explored, and it is odd that the Press decided to release this small book.

Nonetheless, the patterns that Richards documents continue to be all too relevant. 2014 will be remembered as the year the world finally realized the scale of elephant and rhinoceros poaching, and the 2014 TRAFFIC report on this topic makes grim reading. International trade of ivory and rhino horn has reached unheard of levels but this pattern is not new. Ivory was trafficked from Africa to Asia long before the Europeans arrived on the scene, and elephants were transported from Africa across the Mediterranean during Roman times. Nevertheless, 'commodification' is an important way to think about what is happening to these species.

In the book Richards makes his case for global commodification of animals by focusing on furs, deerskins, cod, whales and walrus. In four chapters that span the trade in North America and Siberia (deer skins and furs) and the North Atlantic (cod, whales and walrus) he summarizes troves of data on numbers, extent and trends. He shows how markets responded to increasing and then dwindling numbers of animals. The total numbers are mind-boggling. It is not clear why these cases were chosen (perhaps because of the availability of a robust secondary literature) but many readers will already be familiar with the general outlines of the story he tells.

For all the numbers, there is little synthesis and the reader is left unsatisfied by the surfeit of little-digested data. The original book from which these are excerpted had a central thesis and greater analysis but when removed from this context these chapters feel naked. Despite brief attempts to understand the impacts of the trade on

the species populations, or knock-on impacts on ecosystems, these issues are not of central importance to the author. The biology bits of the book are often dated or drawn from an odd assortment of references. If you need reminding, again, of the major impacts global trade can have, and has had, on animals you may enjoy this

book. At 154 pages it won't take you long. Then you should return to the real work of stopping the trade in ivory, rhino horn and pangolins.

*KENT H. REDFORD Archipelago Consulting,
Portland, Maine, USA
E-mail redfordkh@gmail.com*