

ed by sparks from various industrial machinery. Drushka notes a prevailing lack of concern with the reduction in area of forest: "Well into the twentieth century the sentiment was still widespread that forests were an impediment to development and settlement, and their eradication was acceptable, if not desirable" (page 37). Nevertheless, by turn of the twentieth century, the reduction in forest land had become so marked that it was starting to raise alarm in some quarters, especially in government circles. This awareness marks the beginning of the rise of the forest conservation movement.

This movement sprang from "a desire to maintain forests in perpetuity" (page 61) and was part of a broader conservationist movement, driven by social and ideological trends. Drushka traces the practical application of forest conservation to the establishment of forestry schools at universities and founding of various forest societies. The overall result was the "professionalisation" of forestry and the development of a cadre of scientifically-trained foresters. Canadian forest conservation policies therefore were rooted in a belief that management had to be science-based and, as far as possible, separate from the political process. Drushka points out that in Canada forest conservation was essentially utilitarian and not preservationist, underpinned by the belief that the forests were there to be used, albeit within limits. Hence, throughout various legislative and regulatory initiatives has run the idea of "sustainable yield". However, Drushka argues that all these policy approaches since the Second World War have focussed on sustainable yield of timber only, while other valuable and sustainable aspects of forest lands, such as water quality and biodiversity, have not been included. The conclusion is that an overall comprehensive approach was lacking, which set the stage for the conflicts of the last few decades.

In the last chapter, Drushka examines forest management in the closing decades of the twentieth century. This was a time of considerable conflict and rethinking. It had become apparent that previous estimates of "sustainable yield" were not in fact sustainable, partly because replanting was not keeping up with extraction, partly because of variations in growth, and partly because forest inventories were not in place to allow for a realistic assessment of what was "sustainable". Yet the forest industry was trying to respond to increasing demand for forest-based products, such as

pulp and paper. At the same time, there were increasing demands being placed on forests from other users, including recreationalists and environmentalists, who placed different values on the land. As Drushka notes, clashes between various groups of users were becoming more common. In this context, I think many readers from western Canada will remember the blockades of logging roads and protesters being removed by police. Although Drushka mentions competing uses, he does not examine any in detail, and this superficial treatment might leave some readers wondering why these conflicts were so bitter. Drushka does indicate, however, that these clashes were highlighting incompatibilities between uses and leading to greater polarisation. Increasingly powerful, vocal, and articulate interest groups were lobbying for a preservationist approach to forest lands, partly through advocacy for the establishment of parks and other types of protected areas where the forest industry would be excluded.

The result, concludes Drushka, was that forest management and planning could no longer be the purview just of provincial forest services. The process had to be opened up. Drushka identifies a new approach to management, especially through the 1990s, called "holistic" forestry or "sustainable forest management", which involves "a broadening of the concept of sustained yield to include all components of a forest" (page 69). He sees this change in philosophy as an impetus for the development of the Canada Forest Accord (1998), which acknowledges that forest ecosystems should be managed to benefit a broad spectrum of users. One of the more interesting outcomes of this shift in perspective has been the development of various certification programs. Drushka observes that such programs provide an incentive for forest companies to practice good management. Nevertheless, as Drushka's survey shows, sustainable forest management is clearly more demanding than the old style "cut and move on" approach, requiring greater flexibility and adaptability on the part of the forest industry and a recognition that, no matter how vast they may seem, the forest lands are a finite resource.

ALWYNNE B. BEAUDOIN

Royal Alberta Museum, 12845-102<sup>nd</sup> Avenue, Edmonton, Alberta T5N 0M6 Canada

## ENVIRONMENT

### The Natural History of Bermuda

By Martin L. H. Thomas, First Edition, 2004. Bermuda Zoological Society, P.O. Box FL145, Flatts, FL BX, Bermuda.

Islands are the Rosetta stones of evolution. They also contain some of the most vulnerable natural habitats on the planet and many species at risk. These two fac-

tors make them of great interest to naturalists and ecologists. These themes are explored in intimate detail in *The Natural History of Bermuda*.

Bermuda is an archipelago of over 100 islands in the mid-Atlantic due south of Nova Scotia and 965 kilometers east of Cape Hatteras. Having a surface area

of only 55 square kilometers, no place in Bermuda is more than a kilometer from the ocean. It has a sub tropical climate due to its situation in the Gulf stream, and a fascinating geological history. Some 100 000 years old, Bermuda is a seamount with a limestone cap and red soil layers originating from sand blown from as far away as the Gobi Desert. It has a classic karst landscape perforated by caves and sink holes.

With 63 000 inhabitants it counts as one of the most densely populated places on earth, much exacerbated by an annual influx of 600 000 tourists attracted by its picture post card beauty. Humans have been coming to Bermuda since the 1500s when it was first sighted by Europeans, with permanent settlement dating from the 1600s. The island's terrestrial habitats were quickly transformed; originally covered by forest these were sadly depleted by ship building and other industries and today one finds only tiny remnants. The original inhabitants included a flightless rail and a "crow" rapidly exterminated by the new arrivals. In the author's words, "we may never know what delicate animals and plants were eradicated."

The author repeatedly returns to this theme, describing how humans have, intentionally or not, altered the Island's ecology. Boars, introduced by sailors prior to permanent settlement undoubtedly finished off the flightless rail and other vulnerable fauna. Two other examples tell the tale: Yellow-crowned Night Herons were successfully reintroduced to control an accidentally introduced land crab which had the bad manners to dig golf ball sized holes in golf courses, making a "hole in one a certainty". Less successfully, anoles were introduced to control an accidentally introduced, destructive fruit fly but ended up eating ladybugs which had in turn been introduced to control an accidentally introduced scale decimating native trees. Great Kiskadees, introduced to control the anoles, ended up eating the endangered Bermuda skinks. And so it goes.

Like all remote oceanic islands, Bermuda has a limited terrestrial biodiversity, consisting mainly of species that can be transported over long distances by the wind or ocean currents. This paucity is illustrated by the contrast between the number of native vascular plants, 156, and the number of marine fish, 423. Native inhabitants include birds, insects and plants originating from North America and the Caribbean: the marine life is distinctly Caribbean, sharing many of the same colourful reef species. Some of the arrivals have diverged sufficiently from their ancestors to become endemic species

or subspecies, for example the Bermuda Skink is thought to have evolved from a shared ancestor with the North American Five-lined Skink. Perhaps the most celebrated member of the Bermudian assemblage is the Cahow, or Bermuda Petrel; originally known only from fossils it was famously rediscovered in 1951 when a scant few pairs were found breeding.

All of this is set out by the author in 21 twenty chapters variously focused on key environments (reefs are the largest ecosystem, fresh water ecosystems the smallest) or groups of animals. The book is extensively illustrated with colour photographs but avoids being a "coffee table" book by the detailed narrative which introduces the reader to each theme and describes the key inhabitants and processes involved. Attractive maps are found on the front and end pieces. Occasionally the text reads like a catalog, but there is enough analysis and sufficient interesting observations that the reader's interest should be rekindled. It also reads from time to time like a university lecture, which is not surprising given that the author is a university lecturer. Because each chapter is rather self standing there is a fair amount of irritating repetition which could have been reduced through a final editing session. A few proofing errors are present such as mention of the "Blade-headed Gull", surely a cut above the usual lariid, and the geographically confused Antiguan Anole which apparently hails from Barbados as opposed to the Barbadian Anole transported from Antigua. While most groups are well covered, marine mollusks and sea shells receive scant attention which is curious given the level of interest these attract.

The final chapter looks to the future. Exports of the valuable endemic Bermuda Cedar were banned as early as 1657, however, systematic conservation measures only emerged much more recently. Marine ecosystems are relatively well protected, however, only 7% of the land surface receives official protection. A protected species act was introduced in 2003 and there are prohibitions on the importation of new species. Environmental education, particularly of youth, is a key priority and it is to be hoped that this handsome book will help especially as it is accompanied by a CD, making it an "electronic book." If you have an interest in island biogeography, or just want to dream about your next escape from a Canadian winter, this book will be of interest.

MARK GAWN

Permanent Mission of Canada, 5 avenue de l'Ariana, Geneva, Switzerland

### Saskatchewan Uncommon Views

By John Conway. 2005. The University of Alberta Press, Edmonton. 135 pages. Illustrated. \$29.95.

The results of John Conway's photographic forays across Saskatchewan are certainly "uncommon". Sometimes strikingly beautiful, always minimalist, his photographs elicit reflection, nostalgia, even humour.

While this is not a book on natural history, it will appeal to many readers, especially to serious practitioners of photography and to residents of Saskatchewan steeped in its history and geography. Superficially, the photographs confirm the popular belief that Saskatchewan is flat, dull and colorless. But a closer