

The Wolves of Algonquin Park: A 12-year Ecological Study

By John B. Theberge and Mary T. Theberge. Department of Geography, University of Waterloo, Waterloo, Ontario N2L 3G1 Canada. 163 pages. Available from bkevans@fes.uwaterloo.ca. \$23.50 Canadian, \$20 U.S.

John and Mary Theberge, a husband and wife team, have put together information available on wolves and their prey in one of North America's great ecosystems. Research results from the twelve year period (1987-1999) was used as a core for the publication. Student projects were as follows: 1 Ph.D. thesis, 7 MSc. theses, 11 BSc. theses). Overall, scientific publication of 55 papers is impressive. In the end, it was the Theberges' that pulled the material together into this single monograph. For that they need to be congratulated.

The results of the study are also based on previous work begun in the 1960s. The Theberges reached back in time and reanalyzed and re-evaluated some of the data collected earlier. A major portion of the review centred on the taxonomic study of Wolves in the park. They concluded that these canids were larger than the Coyote-Wolf hybrids to the southwest, smaller than wolves to the northwest. It reinforced earlier conclusions of the existence of "Algonquin type", "tweed type" and "boreal type" Wolves. New is the interpretation that these Wolves are taxonomically connected to the Red Wolf taxon, once more common on the continent to the southeast. In the "canid soup of genetics" these are many theories and assertions. So far there have been no clear indications of the "ultimate" position. Maybe none will ever emerge that will satisfy everyone who is interested in the subject. The Theberges have presented a convincing case.

Other portions of the monograph are equally well presented. There is much in the way of natural history – basic insight into the ecology of the predator within the prey dynamics dictated by geographical and botanical (habitat) setting. In an age of computers, abstract

analysis and spurious mathematical modelling, this work stands out as a major contribution to science. It combines solid field work with a realistic quantitative assessment of the results, and I would recommend this as a case study for first-year graduate students who are contemplating a career in wildlife research. Beyond that, the study has had a real impact on conservation. In 2001, a total year-round Wolf killing ban in areas bordering Algonquin Park was announced by provincial authorities. Political responses were based on research results. It is a rare occurrence that this happens and it is a response to the well executed research. By any standard, that is a remarkable outcome to many years of dedicated work by scientists whose meticulous research and commitment to science were also coupled to a dedication to conservation and to bioethics. This is a scholarly monograph that likely will not be surpassed for many years to come.

At the outset the Theberges posed a series of questions that they wanted to find answers to. Likely some were listed after the fact, when intensive research results came in from the field work and data analysis. That too has strength. I cannot see much that has been left out. Appropriate photos and illustrations are found throughout the text. Some questions arose in my mind as to alternate explanations for some of the conclusions reached. Such results are inevitable and provide a useful basis for future scholars. This monograph is an exceptional document and has set a very high standard. I highly recommend it to anyone just starting field research on mammals, or for those veterans, who have spent much of their time in the pursuit of knowledge in the field of wildlife science.

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BOTANY

Flowers – How They Changed the World

By William C. Burger. 2006. Prometheus Books, 59 John Glen Drive, Amherst, New York. 14228-2197 USA. 337 pages. US \$23.00. Cloth.

Why are flowers important? They are not just for the viewing pleasure of humans, although they are spectacular – but why? This book will answer these questions. "Without the gift of flowers ... man might still be a nocturnal insectivore gnawing a roach in the dark." It is often true that the more we know about something the more we appreciate it and the more we enjoy it. A book that leads to enjoyment is worthwhile, but this book also provides a much needed perspective on the flowering plants at a time when the world faces a biodiversity crisis. It contributes to an improved

understanding of the natural world and a concern for the future. It is a very valuable contribution as well as a very enjoyable book that will appeal to anyone as a result of the friendly writing style.

William Burger, curator emeritus in the Department of Botany at Chicago's Field Museum, takes us on a journey to the discovery of how flowering plants have transformed the world. He begins with "What exactly is a flower?" which is a delightful and comprehensive introduction to flower morphology or what makes a flower a flower. Floral parts and their role are described in different kinds of flowers. It comes as a surprise to many people that the four bright white petals of a dogwood flower are not petals and the flower is actually an

aggregation of many flowers, that a dandelion flower is made up of dozens of flowers, that grasses do have very special flowers with floral parts analogous to those of tulips.

The book is full of fascinating anecdotes. Why are Wolves friends of plants? By 1926 Wolves had been extirpated in Yellowstone and Yogi, Booboo, and the other bears were of course more interested in picnic baskets than controlling the Elk so there were soon too many Elk and the vegetation began to change. Seventy-five thousand Elk were removed between 1926 and 1968 but it was not enough to get things back to the way they were – although it did maintain some plant diversity and kept the park green! Finally, in 1995 a human brain triumphed and thirty-one Wolves were reintroduced to Yellowstone and that quickly got things back to the way they were. There was less browsing pressure as “fear factor” came into play with Elk avoiding places where they were more likely to be ambushed by Wolves. Browsing was not only reduced, it was spatially variable, creating more niches for plants. The entire Chapter 2 is a very entertaining voyage through the annals of ecology indicating how plants are assisted and influenced by other organisms.

Flowering plants have a vast array of enemies, the herbivores, which are everything that eats plants, but they have developed chemical and mechanical defences. This is the subject of Chapter 3 “flowers and their enemies.” It is full of the interesting stories that are known well to biologists but not to others – such as the central American Acacias that have a police force of stinging ants that emerge from the hollow thorns to attack intruders but also destroy the surrounding vegetation that competes with the Acacia. This is a mutually beneficial relationship. As well as a home in hollow thorns the ants are supplied protein by specialized leaf glands and sugar from other glands on the Acacia stems.

Chapter 5 “how are flowering plants distinguished” outlines the evolution of the distinctive features including tissues adapted to prevent water loss and to allow transport of water and nutrients and particularly the seed; which allowed land plants to achieve reproduction without external water, unlike ferns and frogs. Did you know that the simple, 120 million-year-old flower of *Archaeofructus* has cast some suspicion on the evolution of flowers by reduction from Magnolia-like ancestors (contrary to what we told and regurgitated for the final exam a few years ago). The classification system, double fertilization and the evolution of fruit and many other complex phenomena are introduced in a clear and very interesting way. There is a wealth of information in this chapter and although it may be the most tedious chapter in the book, if you want to know what a plant is all about, you will not find a better general presentation of this information.

Chapter 6, “what makes flowering plants so special?” points out that flowering plants were not present in

the forests of 300 million years ago (that made coal) but appeared 120 million years ago, were apparently little affected by the great extinction that wiped out the dinosaurs and other lineages, and became 87% of all plants today. The estimated 100-fold increase in the number of plant species since the Carboniferous period is mostly a result of the proliferation of flowering plants. The chapter explains why they are so successful and special in sustaining 99% of life on the planet. It may seem strange to find an explanation of photosynthesis in the same chapter as an explanation for the similarity of the floras of eastern North America and Japan, but the reader is definitely left with an idea of how special flowering plants are.

With the excellent introduction in these chapters the reader has developed a comprehensive knowledge of botany and ecology which provides a basis for the last two chapters, which indicate how flowering plants changed the world. Chapter 7, “primates, people and the flowering plants” explains how flowering plants created a world in which humans could live. The nectar, pollen, foliage and fruits together set the stage for a proliferation of insects and this led to the evolution of many new groups of insect eaters including the earliest primates, – but how did flatter faces, dextrous digits, upright stance and larger brains develop? It is all here. The chapter concludes with an explanation of how flowering plants and people came together to develop agriculture and how major civilizations rely upon flowering plants.

Of course flowering plants did not just create a world for humans, they also changed the world in many other ways and this is dealt with in Chapter 8, “how flowers changed the world.” As they vastly increased in numbers they increased overall biodiversity. Biochemical specialization is explained with fascinating examples. Effect on the weather is considered including gradual cooling through carbon sequestration and the effect of grassland expansion. The chapter concludes with an outline of the effect of human actions on flowering plants and their impact on the world. An epilogue outlines the responsibility of humans with regard to protecting and managing plant diversity and preserving the world.

Following the epilogue is a series of notes 17 pages in length providing additional information sources for each chapter. This is an extremely useful section, vastly improving the educational value of the work, and it serves as an indication of the very extensive knowledge of the author. The book also has a colour insert of 12 attractive plates. It concludes with a very useful glossary that defines terms such as carpel, caryopsis and cleistogamous. The index is very helpful.

Burger's book is definitely a journey. It pulls together a broad array of concepts into a developing theme of how flowering plants got us to where we are today. It offers a biological perspective including the basics

of botany, ecology and evolution combined into a picture of plants and people and ends with an evaluation of where we are and where we are going. If everyone read and understood this book – if everyone had the knowledge and the respect for life and the inquiring and sensitive mind of its author – we would be in a better position to save the world.

This book is an example of outstanding communication. It provides biologists with what they need to know to teach, but it is not just for the biologist, nor just for Americans who spend nineteen billion dollars

annually on leisure-time activities related to flowers and plants – it is for anyone. Behind the provocative title is a beautifully written book describing what flowering plants are, how they have influenced the evolution of life, contributed to the origin of humans and enabled humans to become the masters of our planet with the responsibility to manage its resources properly. It is so far from being just another book!

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ENVIRONMENT

Guide to Deserts

By Andrew Warren and Tony Allan (General Editors). 2006. Firefly Books, 66 Leek Crescent, Richmond Hill, Ontario L4B 1H1 Canada. 240 pages. \$19.95 Paper.

After reading this book I realised I have never been to “see” a desert. I searched for Scimitar-horned Oryx (northern Sahara). I marvelled at the marine life off the Peruvian-Chilean coast (Sechura-Atacama desert). I have visited the impressive Abu Simbel temples (Libyan desert). But I have not really looked at the desert for its own sake. This is a mistake I will not repeat. While I have not been completely unobservant there are many subtleties I have missed. In future I will look for zengens, desert pavement, inselbergs and yar-dangs.

Deserts is a neat, small book in which the author defines deserts and describes the climatic conditions that shape their landscapes. He gives examples of the different types of desert and illustrates the impact wind and – yes – water have had on the land and its inhabitants. There are six chapters on aspects of deserts and an atlas of the major desert areas. The chapters cover wildlife such as plants, invertebrates and mammals and how they are adapted to thrive in an arid ecosystem. The people of the desert, their food, clothes, homes, customs and religions are described. This is an important chapter with the current focus of news from the deserts of Badiyat Ash Sham (Iraq) and Dasht-E-Margow (Afghanistan). The authors explain the riches of the desert. Not just oil, but farming and mining. They also look at conservation issues and the damage done by human activity. After reading this material I am more convinced we need to re-assess the use of water for irrigation.

The atlas is really a field guide of the world's 14 major arid zones [Canada's minuscule desert in British Columbia is not mentioned]. In addition to a map there are descriptions of each area's key characteristics. This includes some history, the people and key issues as well as a physical description. The authors have written a special chapter on visiting deserts to encourage people to see these special places.

There are plenty of photos and illustrations. These have been chosen not so much as pretty pictures, but to illustrate the points in the text. They range from the stark beauty of Monument Valley, through the rock-cut ruins at Petra to simple depictions of dunes. They show the faces and costumes of Tuareg, Berber and Bedouin (but not Navajo or Apache). The author has not missed mine sites, luxury hotels or aerial views in making his selection. One photo supposedly containing Giraffe, Ostriches and Eland shows six Oryx, some distant gazelles (presumably Springbok) but no Eland.

This book is very interesting to read just because it puts deserts in perspective. For someone like me who goes to places looking for something special, this book gives added value to a trip. For all of us it gives a wonderful background on where desert's ecosystem fits in the world's biosphere. The authors have convinced me that deserts are important and I will pay more attention in the future. Buy this book for yourself.

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