Botanic Gardens: Modern-Day Arks

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contamination, which is the ultimate source of those marbles, that tapioca, and the serpentine nematode hatched from yet another egg.

Drisdelle has written one of those rare books that is fun to read but does not skimp on scholarly rigor. Both the chapter notes and the selected bibliography are detailed; together, they make up almost 30 pages of the book. It is a treasure trove of anecdotes, not to mention novel perspectives, that professors of organismal animal biology will find invaluable in their teaching. It is also a fabulous auxiliary text for courses about parasitology or public health.

The word *parasite* originated as a Greek term for someone who eats at someone else's table, often without payment. We have all had unwelcome guests in that sense. Some of those folks whose visits we have endured might have been more welcome were they half as interesting as the guests we meet in *Parasites: Tales of Humanity's Most Unwelcome Guests.*

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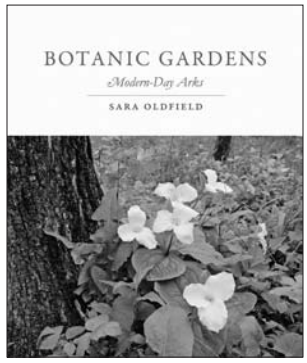
GARDENS IN DEFENSE OF THE PLANT KINGDOM

Botanic Gardens: Modern-day Arks. Sara Oldfield. MIT Press, 2010. 240 pp., illus. $29.95 (ISBN 9780262015165 cloth).

Since the 1980s, botanical gardens (*botanic garden* is a variant more frequent outside North America), like zoos, have become increasingly active in conservation efforts. And rightly so, because these institutions often harbor critical expertise and practical experience in taxonomy, plant geography, seed biology, and plant propagation. The role of botanical gardens is all the more important now, because traditional organismal botany departments are disappearing from many universities. One could argue, in fact, that botanical gardens derive the reason for their existence from a diverse natural world; therefore, they ought to make their primary function be the survival of biodiversity in the wild—as a matter of both principle and practice. Once, gardens had the luxury of restricting their focus inward while assuming that the natural world of plant diversity was safe outside their walls. Today's extinction crisis and the effects of global climate change tell us that this is no longer a tenable or acceptable assumption.

Botanic Gardens: Modern-day Arks depicts the critical role that botanical



gardens can and do play in plant conservation by profiling the work of particular gardens as examples. Between a brief introduction to the plant-extinction crisis and a concluding overview of future environmental challenges, the book offers beautiful pictures and describes programs in Europe (four gardens), Asia Minor (one garden), North America and Hawaii (four gardens), South America (one garden), Asia (two gardens, including a program that is a network of sites), Africa (three collaborative programs that include multiple sites), and Australia (one garden). Although the text presents excellent examples that are wonderfully illustrated, it lacks a deeper analysis of whether this garden network is sufficiently prepared—in geographic locations, facilities, or funding—for the enormous task at hand: that of plant species conservation.

Although a botanical garden staff member might want greater depth in this book, the audience for *Botanic Gardens* is a different and important one: The book speaks to the general public and to conservationists not yet aware of the crucial role and the potential of gardens. Other botanical programs are mentioned among these 16 profiles, but author Sara Oldfield's approach is not to analyze the entire botanical garden effort but, rather, to illustrate the development of the work underway using specific examples. At times, particularly from the point of view of a North American, this approach feels too abridged. For instance, the Center for Plant Conservation (CPC) is mentioned only within the context of three gardens, but the CPC is an integrated network of 36 gardens in the United States whose efforts in plant conservation exist on many levels, including connecting gardens to federal land managers and conservation organizations, developing funding for member gardens, and promoting public education. The CPC network is an excellent model for the kind of work that this book is promoting. Although similar networks in South Africa and Asia are described, the CPC is not given the same direct treatment as those. In a text box, the idea of the National Collection (the CPC's term for the germplasm samples of critically endangered species) is mentioned, but without reference to the organization itself. Perhaps this oversight reflects only that the author's perspective is more international in scope—Oldfield is secretary general of Botanic Gardens Conservation International and chair of the International Union for Conservation of Nature's Species Survival Commission's Global Tree Specialist Group. She has also worked for the United Nations Environment Programme's World Conservation Monitoring Center.

As *Botanic Gardens* makes clear, the threats that we face will be measured in decades, if not centuries, and these modern-day arks must preserve more than one male and one female of each species; complete genetic samples are required. These genetic collections must

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be wholly representative, with a backup collection in reserve against extinction in the wild. It is also critical to reintroduce these *ex situ* garden collections in order to restore wild populations. The book traces the work produced in these gardens, including field inventories of remaining populations, taxonomic collections of seeds, seed vault storage, and the process of reintroduction and restoration. The book further suggests that the work of gardens will need to shift from its present historical emphasis to one of conservation, as the environment and our global climate continue to grow as causes of greater concern.

Botanical gardeners tend to think of themselves as conservationists of plant species, but they also implement activities that can be seen as harmful; namely, the introduction of invasive plant species that can reduce diversity in natural areas and, perhaps even more importantly, that can introduce pest insects and diseases that decimate native plants in the wild. Oldfield mentions several gardens that are active in collecting plants from all over the world and then growing them at their institutions, either as specimen plants or in habitat settings. She reviews some historical work of collectors—for instance, Wilson's collection of honeysuckle species in Asia—but without noting that many of these collections are invasive species.

Invasive species are listed several times in this book as a threat to native wild plants, but the historical and potential role of botanical gardens regarding this ongoing problem is not described. The botanical garden community has responded, however, with such efforts as the drafting of codes of conduct. The purpose of gardens (often in the developed world) to explore distant places (often those in the developing world) and bring plants back for cultivation is, hopefully, changing in a way that will lessen the risk of new pest species. However, the book's omission of the contribution that botanical gardens have made to the problem of invasive species, as well as to other environmental concerns (e.g., water overuse, herbicides and pesticides, dependence on fossil fuels for garden equipment), leaves an incomplete picture of these institutions in today's context of environmental awareness.

Botanic Gardens succeeds in its purpose of underscoring the vital role that botanical gardens are beginning to play in global conservation of biodiversity. Oldfield inspires her readers with her choices of specific examples of gardens and plants, and she also brings a personal perspective to the book by telling the stories of the individual gardeners carrying out this work. As the environmental crisis continues to unfold, the book assures us that scores of plants, found in either living or seed collections, already have been saved from extinction after vanishing from the wild.

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