

be back in fashion again after a period in the wilderness. In this, he reveals his conceptual dependence on Wilson, who is largely responsible for attempting to rehabilitate the concept. The basic idea is that the colony behaves as a single organism, with the individual workers being equivalent to the cells of the body and the division of labor resembling the functions of different organs within the body. I think we should be careful not to regard this as more than an analogy.

Two main differences exist between ant colonies and single organisms. First, in a single organism, all the somatic cells are genetically identical, whereas individual ants, except in a few rare cases where clonal reproduction occurs (Rabeling et al. 2009, Ito et al. 2010), are not. This is an important distinction; genetic variation gives rise to both potential and actual conflicts within colonies. Not all individuals necessarily share the same interests. How these conflicts are resolved has been one of the most fruitful areas of ant research (Ratnieks et al. 2006). Moffett almost completely ignores the disharmony within colonies—a feature that this book shares with *The Superorganism*, coauthored by his mentor Wilson (Hölldobler and Wilson 2009). The second important distinction between an organism and an ant colony is that, at least within the animal kingdom, evolution has resulted in increasingly centralized control over the organism. In contrast, there is no central control within an ant colony; coordinated behavior arises through a process of self-organization (Boomsma and Franks 2006). As with any analogy, the most interesting insights are discovered at the point at which the analogy fails.

Ultimately, the issue at hand is the level of individuality that each ant does or does not possess. The concept of the superorganism implies that the units (the ants) are identical and interchangeable. Moffett himself observes—to his credit—that ants do not act identically but appear to have individual “personalities.” It is these individual differences that make the functioning of the colony so fascinating and so challenging to explain. The concept of the

superorganism tends to obscure this. I believe that a closer examination of the individuals that constitute a colony would yield some astonishing insights that have so far been overlooked.

In the meantime, *Adventures among Ants* may reach a broader audience than other recent publications and may therefore stimulate interest in ants among a new generation. Just one word of caution to these potential myrmecologists: Although the days of field study are hopefully not at an end, we cannot all expect to emulate the adventures of Indiana Moffett.

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#### IS NATURE DEAD?

**Beyond Naturalness: Rethinking Park and Wilderness Stewardship in an Era of Rapid Change.** David N. Cole and Laurie Yung, eds. Island Press, 2010. 304 pp., illus. \$35.00 (ISBN 9781597265096 paper).

**N**o, of course nature is not dead, but our ideas of nature may be

severely tested by the rapid environmental changes that are now upon us. That, at least, is the premise of *Beyond Naturalness: Rethinking Park and Wilderness Stewardship in an Era of Rapid Change*. David Cole, a geographer at the Aldo Leopold Wilderness Research Institute in Missoula, Montana, and Laurie Yung, a conservation social scientist at the Wilderness Institute at the University of Montana, have assembled contributions from scientists in academia, nongovernmental organizations, and resource management agencies in the United States, Canada, and Australia in order to ponder specifically whether and how the management of parks and wilderness areas should change to deal with the prospect that the future is likely to be quite different from the present and the past.



And the future will indeed be different. Environments everywhere are undergoing rapid changes, many of them catalyzed by human activities. Evidence is accumulating almost daily that climate change is not some abstract prognostication about the distant future but is happening now. Other forces are also at work. Land-use change, the resulting fragmentation and loss of habitat, and the explosive spread of invasive species are contributing to a mounting reshuffling of species in biological communities. Most projections agree that, as the effects of climate change set in, extreme events will become

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more frequent and ecological thresholds will be encountered more often. The resulting changes in species' distributions are likely to reconfigure nature, creating assemblages and ecosystem dynamics that move beyond what has occurred in recent centuries or even millennia—to what have been called “no-analogue” systems.

It is the specter of these changes that haunts the pages of this book. When national parks and wilderness areas were first established in the United States, it was largely because they appeared to be something close to pristine nature, places “untrammelled by man,” in which natural processes would reign supreme. As the transformation of much of the continent accelerated, maintaining the “naturalness” of these areas became the guiding force behind stewardship. This involved more than putting a fence around the area to exclude development or exploitation; the aim was to restore or maintain historical conditions and to minimize human impacts. As pressures on parks and wilderness areas and their surroundings have increased, stewardship has entailed more active intervention—wildfire management, wildlife harvesting, or the shepherding of human visitors to designated areas—in order to maintain the “naturalness” of protected areas. It is the thesis of this book that a continued emphasis on an idealistic (and probably mythical) vision of “naturalness” is no longer appropriate and will certainly not be feasible in a no-analogue future. To realize the value of parks and wilderness in the coming era of change, new approaches are needed.

*Beyond Naturalness* develops these approaches in three sections. The first reviews the environmental changes that compel us to rethink why protected areas are important. If protecting and stewarding “naturalness” is no longer appropriate, what should managers try to do? Depending on the situation, the goals may differ, but whatever they are, they should be clearly and operationally articulated. This is particularly important as goals shift from what they have been in the past.

The second section develops four approaches to managing protected areas that differ in their objectives. A detached, hands-off approach may be appropriate if the objective is to respect nature's autonomy and let events take their course, even if this means losing some components of the ecosystem. The other three approaches emphasize maintaining the ecological integrity of ecosystems, fostering a fidelity to historical conditions, or enhancing resiliency in the face of change. No single approach is advocated as being best, and there are frequent calls for using—and reusing—a combination of approaches to confront the coming uncertainty and risk. Clearly, each emphasis reflects a different philosophy about what is to be valued in nature. Despite valiant attempts, however, the defining terms—*ecological integrity*, *historical fidelity*, and *resilience*—remain just as nebulous as *naturalness*. The third section contains a somewhat eclectic set of chapters covering the specific challenges created by invasive species, climate change, management scale, uncertainty, and “wild design” (how to exercise management intervention in a protected area without destroying the values one is trying to protect). The final chapter does a good job of synthesizing the main themes that emerge from the previous chapters.

Overall, the material in *Beyond Naturalness* is clearly and compellingly presented. The book does not suffer the common maladies of disconnectedness and uneven presentation that plague many edited, multiauthor volumes; instead, the editing is so strong that all of the chapters read as if they had been written by a single person. Individuality has been lost in favor of consistency. This perhaps accounts for the annoying (to me, at least) overuse of quotations in many chapters.

The overarching message of *Beyond Naturalness* is that we are on the cusp of massive changes in environments and ecosystems that will require increasing levels of management intervention to maintain the ecological values of parks and wilderness. The emphasis of this

management should be on facilitating the adjustment of species and ecosystems to coming change instead of clinging to the belief that we can keep nature as it is or was. Species will be lost. Ecosystems will change. We can no longer follow Aldo Leopold's admonition that the first rule of intelligent tinkering is to save all the parts. Managers will need to do their job with an incomplete set of old parts and some new parts with unknown functions, and they will need new tools to do so. It is not the intent of *Beyond Naturalness*, however, to provide the toolbox and the plans for stewardship of nature in the future. Rather, the aim of the book is to shake us out of the belief that our past approaches need only be tweaked and that all will be fine. Instead, the intent is to provide the fodder for thinking outside the box of traditional park and wilderness stewardship. In that, *Beyond Naturalness* succeeds admirably.

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## NEW TITLES

### **Daphnia: Development of a Model Organism in Ecology and Evolution.**

Winfried Lampert. In *Excellence in Ecology*, vol. 21. International Ecology Institute, 2011. 276 pp., illus. 44 (ISSN 0932-2205 cloth).

### **Energy Development and Wildlife Conservation in Western North America.**

David E. Naugle, ed. Island Press, 2011. 357 pp., illus. \$40.00 (ISBN 9781597266581 paper).

### **Field Guide to the Rare Plants of Washington.**

Pamela Camp and John G. Gamon, eds. University of Washington Press, 2011. 408 pp., illus. \$39.95 (ISBN 9780295990927 paper).