

the end product. It is my hope that this constraint, a necessary evil if you will, will force ever-diligent scrutiny of what is done or not done on the part of those involved in bringing GM products to market.

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CARNIVOROUS PLANTS OF THE UNITED STATES AND CANADA. *Second Edition.*

By Donald E Schnell. Portland (Oregon): Timber Press. \$39.95. 468 p; ill.; index of plant names. ISBN: 0-88192-540-3. 2002.

Botanists, carnivorous plant enthusiasts, and natural history buffs will welcome this comprehensive treatment of the carnivorous plants of the United States and Canada. This new version of Schnell's classic, out-of-print book is nearly three times as long as the previous edition. The author has added an enormous amount of detail on the biology of these botanical curiosities, and greatly expanded the attention paid to their conservation. *Carnivorous Plants* also is a welcome complement to Peter D'Amato's *The Savage Garden: Cultivating Carnivorous Plants* (1998. Berkeley (CA): Ten Speed Press), as the latter focuses almost exclusively on cultivation of carnivorous plants in the greenhouse and backyard bog. In contrast, the current volume will be an invaluable addition to the bookshelf and field backpack.

The first part of the book is an introduction to the natural history and biology of carnivorous plants. This section draws heavily on older literature, with few citations beyond the mid-1980s. The author's biomedical background shows through on occasion, as when he describes bladderworts as "aqueous" (as opposed to aquatic). But by and large, this section provides a reasonable introduction to these plants. More technical reviews of the recent scientific literature have been published (for example, see A M Ellison and N J Gotelli. 2001. *Trends in Ecology & Evolution* 16(11):623-629).

The bulk of the book, and its main attraction, is composed of descriptions, photographs, and range maps of each species of carnivorous plant in America north of Mexico. For each species, Schnell provides taxonomic synonymy; common names; botanically technical description; flowering phenology; geographic distribution; habitat; ecological comments; cultivation notes; marvelous photographs; and, when appropriate, discussion of infraspecific taxa and hybrids. In making decisions and suggestions about infraspecific taxa, Schnell is conservative. He favors varieties over subspecies, and subspecies over species, and emphasizes mor-

phological data and field traits over molecular data in his arguments.

The book concludes with a discussion of conservation issues and threats. Carnivorous plants are zealously overcollected for commercial sale, and their wetland habitats are disappearing as subdivisions are constructed, mosquito ditches are dug, and water tables are lowered as people demand more water or surrounding forests are cleared. Few solutions are in sight; Schnell favors private initiatives such as land purchase by land trusts and The Nature Conservancy over government intervention. There are also groups (especially in the southeastern United States) that rescue populations of carnivorous plants growing in the paths of bulldozers. These can be propagated and used later in restoration and recovery efforts, which are the best hope for preserving these plants for future generations.

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ENVIRONMENTAL PHYSIOLOGY OF PLANTS. *Third Edition.*

By Alastair Fitter and Robert Hay. San Diego (California): Academic Press. \$49.95 (paper). xii + 367 p + 16 pl; ill.; name, species, and subject indexes. ISBN: 0-12-257766-3. 2002.

For years, two books on the physiology of plants in their environment have stood side by side on my bookshelf—Larcher's *Physiological Plant Ecology* (1975. Berlin (Germany): Springer-Verlag), and Fitter and Hay. I have valued the wonderful comparative tables in Larcher, and the analytical approach of Fitter and Hay. Now the third edition of Fitter and Hay has appeared, with the same basic layout as before. The acquisition of resources by plants is rightly given primacy, followed by responses of plants to environmental stress (mainly temperature and toxicity). A final chapter puts the plant into a community, covering interactions between plants and other organisms. The third edition is an improvement on an already valuable work: it is accurate, well organized, and readable.

A problem faced by authors of such a book is whether to include basic physiology or to assume that it will be learned elsewhere. Should the pathways of photosynthesis, or the mechanism of nitrate uptake, or the regulation of gene activity, be treated in depth? This book generally assumes that the basics are known, and concentrates on the plant functioning in its environment. There are areas where I would have wished for different emphases—for example, the section on water transport avoids some current controversies. The biggest disappointment is the last chapter, where