

tophytes, which can be grouped in relation to their different nutritional modes, are discussed roughly in proportion to the information about them. Most of the book is devoted to photosynthetic gametophytes with smaller segments on subterranean gametophytes and those of heterosporous ferns.

The haplophase of the fern is considered from spore structure and germination to mature gametophyte. Emphasis is placed on the transition stages when developmental changes occur. Cellular and biochemical changes are examined along with the role of physiological factors or environmental influences in these critical stages in gametophyte morphogenesis.

In addition to reviewing the morphogenesis Raghavan considers the reproductive biology of ferns, since gamete formation is the function of the gametophyte. Even though the gametophytes of homosporous ferns are monoecious and homozygous sporophytes are relatively easy to obtain, there are mechanisms that usually reduce homozygosity in nature. Thus, the control of gametangial formation and how it relates to gametophyte morphogenesis is discussed in detail along with gametogenesis and fertilization.

The last chapters consider two phenomena that are exhibited by some ferns or some fern gametophytes under appropriate conditions: the transition from sporophyte to gametophyte without spores (apospory) and the vegetative formation of a sporophyte from a gametophyte without fertilization (apogamy). These are interesting developmental processes that shift the morphology from gametophyte to sporophyte or vice versa without the usual change in level of ploidy.

Each chapter ends with some general comments in which pertinent questions about the present state of knowledge are raised. Suggestions concerning the types of information necessary to promote a better understanding of the developmental processes are made as well. There is an excellent compilation of the pertinent literature through 1987.

Raghavan's earlier studies of gametophytes have provided him with a solid understanding of their biology and the basis for authoring a superior book. I would recommend the work to pteridologists, botanists, and anyone interested in learning about the fern gametophyte and its potential for experimental studies on plant morphogenesis.

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## Some Other Books of Interest

**Rainforests.** A Guide to Research and Tourist Facilities at Selected Tropical Forest Sites in Central and South America. JAMES L. CASTNER. Feline Press, Gainesville, FL, 1990. xxxvi, 380 pp., illus. Paper, \$21.95.

**Neotropical Rainforest Mammals.** A Field Guide. LOUISE H. EMMONS. Illustrations by François Feer. University of Chicago Press, Chicago, IL, 1990. xiv, 281 pp., illus., + plates. \$45; paper, \$19.95.

A very large number of books have been put before the public to document the importance of and call attention to the endangerment of the tropical rainforests. What is there to advise readers who want to experience the situation at first hand? Among books that have attempted to convey some feel for the ambience of the rainforest are John Kricher's *A Neotropical Companion* (see *Science* **245**, 315 [1989]) and Marius Jacob's *The Tropical Rain Forest: A First Encounter* (see *Science* **246**, 828 [1989]), whose author notes forthrightly that a rainforest may not always be a pleasant place to be.

At a still more practical level we now have Castner's tourist guide to the rainforests of Peru, Ecuador, French Guiana, Venezuela, Trinidad, Costa Rica, and Panama. Country by country, Castner presents information based on his own experiences about some 40 rainforest research and tourist facilities and nearby cities. For each country he presents some basic information (population, language, currency, airlines, basic geography) such as one might find in any travel guide and then with the rainforest-oriented tourist particularly in mind lists books, maps, and sources thereof, tourist bureaus and travel agents, and conservation and scientific organizations. For the facilities themselves, the information given includes some basic history and natural history, how to arrange a visit, how to get there (possibilities include a 10-hour trip by motorized canoe in one case), provisions needed, and costs. The buildings that constitute the facilities and the accommodations available are described in some detail. That rainforest tourism is not for the fainthearted is underscored by the types of information given—rather than reading about swimming pools and fitness centers one is told about the availability of flush toilets, potable water, and electricity. Following the country-by-country surveys is a chapter listing "rainforest information sources"—books and periodicals in various categories ranging from "adventure" to "for biologists"—and organizations, including both conservation groups and explorers' clubs. Further chapters list organizations

that provide opportunities for lay persons or students to work with scientists in the field and sources of funding for researchers. Finally, appendixes list travel agencies, provide tips for travelers ("exchange some money before you arrive," "carry baggies or a waterproof pouch"), give Spanish equivalents of an assortment of biological and geological terms, list some tropical biologists by field, and list zoos and botanical gardens in the United States. Some 30 drawings showing rainforest species are interspersed with the text, which also includes photographs of many of the facilities listed.

Also of a size to fit in a suitcase (or even a baggie) is Emmons and Feer's directory of the mammals one might encounter—specifically the 500-odd species to be found in Central and South America at elevations below 1000 meters. Species accounts occupy 218 pages of the book, beginning with opossums and including along with such well-represented groups as anteaters and their kin, bats, monkeys, and rodents two species each of tapir, peccary, manatee, and dolphin. For each species is given information about measurements and markings, geographic variation, similar species, sounds, natural history (sociality, feeding habits, and so on), geographic range (there are also distribution maps), conservation status, and local names, insofar as information is available. Most entries also include one or more references to the scientific literature. A striking feature of the book is a set of 29 color and 7 black-and-white plates showing over 200 species and emphasizing features useful for identification to the level of genus. Appendixes include a glossary defining some basic terms ("eyeshine," "fossorial," "meatus," "whitewater"), a key to families and genera, a general account of classification, biogeography, and conservation, illustrations of large-mammal tracks, some general references, and indexes of scientific and (English) common names.

—K.L.

## Books Received

**Addiction Controversies.** David M. Warburton, Ed. Harwood, New York, 1990. xiv, 386 pp., illus. \$80.

**After the Breakup.** U.S. Telecommunications in a More Competitive Era. Robert W. Crandall. Brookings Institution, Washington, DC, 1991. xiv, 174 pp., illus. \$29.95; paper, \$11.95.

**Age-Related Cataract.** Richard W. Young. Oxford University Press, New York, 1991. xiv, 290 pp. \$55.

**Anatomy of the Cortex.** Statistics and Geometry. V. Braitenberg and A. Schuz. Springer-Verlag, New York, 1991. x, 249 pp., illus. \$39. Studies of Brain Function, vol. 18.

**Anorexia and Bulimia.** Anatomy of a Social Epidemic. Richard A. Gordon. Blackwell, Cambridge, MA, 1990. xii, 174 pp. \$27.95.

**Bioelectrochemistry 3.** Charge Separation across Biomembranes. G. Milazzo and M. Blank, Eds. Plenum,