

during the previous decade, as well as the deterioration of the U.S. position in the world economy, the declining strength of the U.S. labor movement, and growing national political conservatism, which may have compelled and facilitated the hiring of more workers from pools of traditionally cheap labor.

Moreover, little attention is given to the generalizability of the factors that contributed to occupational feminization in the 1970s to other eras in which occupational feminization has occurred. For example, women temporarily entered "male" factory occupations during both world wars, when labor shortages in manufacturing were created by the drafting of the male factory workforce into the military. Comparing the war and 1970s eras could reveal any repeating configurations of social, political, and economic conditions associated with occupational feminization. Such a comparison would also permit an assessment of the factors that affect the permanence of occupational feminization, as well as the factors that regenerate occupational sex segregation following a period of occupational feminization.

The authors show that the occupational feminization of the 1970s fell short of constituting gender integration. Most indices of occupational sex segregation measure the degree of sex segregation in broadly defined occupations. In contrast, the case studies in this book examine sex composition trends in the subspecialties of occupations. Rather than becoming "integrated," with each sex making up half of an occupational workforce and the two performing the same tasks, most of the occupations that were studied became "ghettoized," in that women ended up in the low-paying subspecialties. A few occupations—typesetting and composition and insurance examining and inside adjusting—"reseggregated," in that women came to account for a majority of occupational employment. Examples of ghettoization include the occupations of bus driver, into which women entered the low-paying school-bus driver subspecialty; real estate sales, which employed women in the low-paying residential sales subspecialty, as opposed to commercial real estate sales; and systems analysis, in which women tend to be employed as the lower-paid analysts who interact with computer users, rather than the higher-paid analysts who interact with other computer professionals and managers. The U.S. labor force, then, continues to be occupationally segregated, as well as stratified by wages, along gender lines.

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The Perception of Odor

The Vertebrate Olfactory System. Chemical Neuroanatomy, Function and Development. NORBERT HALÁSZ. Akadémiai Kiadó, Budapest, 1990. xviii, 281 pp., illus. \$39.

Lewis Thomas in his book *Late Night Thoughts on Listening to Mahler's Ninth Symphony* noted that "we might fairly gauge the future of biological sciences, centuries ahead, by estimating the time it will take to reach a complete, comprehensive understanding of odor." Since the days of Ramon y Cajal, the striking laminated morphology and complex neuronal circuitry of the olfactory bulb, the first synaptic relay and information-processing station in the brain, have attracted the attention of neuroanatomists and neurophysiologists, and an enormous wealth of information regarding neural circuitry in the olfactory bulb accumulated over decades of research. The perception of odor has again become a topic of widespread interest, and advances in understanding odor recognition and olfactory transduction are occurring at an accelerated pace. This new surge of interest in vertebrate chemoreception is fueled by a series of rapid successes in molecular studies of peripheral mechanisms.

The Vertebrate Olfactory System by Norbert Halász provides a timely, detailed compendium that integrates this vast amount of historic and recent information into a comprehensive description of the olfactory system. The painstaking detail with which different cell types and their connections are described and the more than 1000 references cited attest to the epic endeavor undertaken by Halász in writing this monograph.

The Vertebrate Olfactory System follows the publication of several other books on olfaction, including *Neurobiology of Taste and Smell* (T. E. Finger and W. L. Silver, Eds., Wiley-Interscience, 1987), an excellent introduction to vertebrate chemoreception, and *Molecular Neurobiology of the Olfactory System* (F. L. Margolis and T. V. Getchell, Eds., Plenum, 1988), a series of well-chosen chapters presenting recent promising advances in molecular explorations of the olfactory system. Halász's book differs from these earlier ones in its exhaustive documentation, which renders it particularly useful as a reference work for experts but exceeds the level of general introduction most useful to the novice. Such a reader would benefit from reading *Neurobiology of Taste and Smell* prior to tackling *The Vertebrate Olfactory System*.

Another distinguishing quality of this book stems from its having a single author.

Though this has resulted in a coherent style and viewpoint, it has also resulted in a bias towards the author's own expertise. Of the nine chapters that constitute the work, the chapter describing morphological, immunohistochemical, and electrophysiological aspects of the olfactory bulb occupies almost two-thirds of the book, leaving information on other aspects of olfaction, such as peripheral mechanisms, the accessory olfactory system, behavior, and human olfaction, somewhat underrepresented. This chapter is definitely the strong point of the book. It contains the most comprehensive description to date of the neural inputs, outputs, and interconnections that make up the circuitry of the olfactory bulb and provides an encyclopedic documentation of the morphologies, connections, and neurotransmitter contents of virtually every cell of the olfactory bulb that has ever been described. It also connects well with the two chapters that follow it, which describe the olfactory tract and microcircuitry in olfactory cortical areas.

Throughout this book, Halász displays an almost uncanny familiarity with intimate details of decades of literature. He wisely steers clear of controversy and limits himself to well-established experimental facts in providing a unified overview of the functional anatomy of the olfactory system. In doing so, he has provided a monograph that will remain a valuable source of information for many years to come.

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The Fern Gametophyte

Developmental Biology of Fern Gametophytes. V. RAGHAVAN. Cambridge University Press, New York, 1989. xiv, 361 pp., illus. \$80. Developmental and Cell Biology Series.

The familiar form in the life cycle of the fern is the large, structurally complex, long-lived sporophyte. This book, however, is about the small, simple, and generally transient gametophyte. Though less obvious in nature than the sporophyte, the haploid gametophyte is a useful organism for the study of many biological phenomena. Raghavan has done an admirable job of demonstrating the value of fern gametophytes for the investigation of various developmental problems.

The title is true to the contents, and comments about gametophytes of *Equisetum* and *Isoetes* are brief in comparison to those about the haplophase of ferns. Fern game-

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,