

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.

DEAN P. WHITTIER
Department of General Biology,
Vanderbilt University,
Nashville, TN 37235

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. Schüz. 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,

New York, 1991. xii, 337 pp., illus. \$79.50. Ettore Majorana International Science Series (Physical Sciences), vol. 51. From a course, Erice, Italy, Nov. 1988.

Biographical Dictionary of Medicine. Jessica Bendiner and Elmer Bendiner. Facts On File, New York, 1991. x, 284 pp. \$40.

The Biology of the Naked Mole-Rat. Paul W. Sherman, Jennifer U. M. Jarvis, and Richard D. Alexander, Eds. Princeton University Press, Princeton, NJ, 1991. xvi, 518 pp., illus., + plates. \$65; paper, \$24.95. Monographs in Behavior and Ecology.

Biosensors. Elizabeth A. H. Hall. Prentice Hall, Englewood Cliffs, NJ, 1991. x, 351 pp., illus. \$52. Prentice Hall Advanced Reference Series: Engineering.

Clusters of Galaxies and Extragalactic Radio Sources. A. D. Kuz'min, Ed. Nova, New York, 1990. xiv, 326 pp., illus. \$95. Proceedings of the Lebedev Physics Institute, Academy of Sciences of the U.S.S.R., vol. 189. Translated from the Russian edition (Moscow, 1988) by Paul Makinen.

The Conservation Atlas of Tropical Forests. Asia and the Pacific. N. Mark Collins, Jeffrey A. Sayer, and Timothy C. Whitmore, Eds. MacMillan, London, and Simon and Schuster, New York, 1991. 256 pp., illus. \$95.

Constructive Quantum Field Theory 2. G. Velo and A. S. Wightman, Eds. Plenum, New York, 1990. viii, 344 pp., illus. \$92.50. NATO Advanced Science Institute Series, vol. 234. Series B, Physics. From an advanced study institute, Sicily, Italy, July 1988.

The Course of Life. Vol. 3, Middle and Late Childhood. Stanley I. Greenspan and George H. Pollock, Eds. International Universities Press, Madison, CT, 1991. x, 562 pp. \$65. Revision of *The Course of Life: Psychoanalytic Contributions Toward Understanding Personality Development*.

Differential Equations. A Dynamical Systems Approach. Part 1, Ordinary Differential Equations. John H. Hubbard and Beverly H. West. Springer-Verlag, New York, 1991. xx, 348 pp., illus. \$39. Texts in Applied Mathematics, 5.

A Disease of Society. Cultural and Institutional Responses to AIDS. Dorothy Nelkin, David P. Willis, and Scott V. Parris, Eds. Cambridge University Press, New York, 1991. viii, 287 pp. \$42.50; paper, \$13.95.

Disorder and Fracture. J. C. Charmer, S. Roux, and E. Guyon, Eds. Plenum, New York, 1990. x, 305 pp., illus. \$75. NATO Advanced Science Institute Series, vol. 235. Series B, Physics. From an advanced study institute, Cargèse, France, May 1989.

Electrophoresis of Large DNA Molecules. Theory and Applications. Eric Lai and Bruce W. Birren, Eds. Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, 1990. x, 156 pp., illus. Paper, \$34. Current Communications in Cell and Molecular Biology, 1.

Elton's Ecologists. A History of the Bureau of Animal Population. Peter Crowcroft. University of Chicago Press, Chicago, IL, 1991. xx, 177 pp., illus. \$35; paper, \$14.95.

Engineering Design of the Cardiovascular System of Mammals. Thomas H. Dawson. Prentice Hall, Englewood Cliffs, NJ, 1991. xii, 179 pp., illus. \$60. Prentice Hall Biophysics and Bioengineering Series.

Environmental Hazards of War. Releasing Dangerous Forces in an Industrialized World. Arthur H. Westing, Ed. International Peace Research Institute, Oslo, Norway, United Nations Environment Programme, Nairobi, Kenya, and Sage Publications, Newbury Park, CA, 1991. xvi, 96 pp. \$39.95. Military Activities and the Human Environment. From a symposium, Geneva, Oct. 1988.

The Experimental Foundations of Modern Immunology. William R. Clark. 4th ed. Wiley, New York, 1991. xx, 506 pp., illus. \$52.95.

Family Transitions. Philip A. Cowan and Mavis Hetherington, Eds. Erlbaum, Hillsdale, NJ, 1991. xii, 319 pp., illus. \$49.95. Family Research Consortium, Advances in Family Research. From a summer institute, Santa Fe, NM, 1987.

Fear, Avoidance, and Phobias. A Fundamental Analysis. M. Ray Denny, Ed. Erlbaum, Hillsdale, NJ, 1991. xii, 455 pp., illus. \$79.95; paper, \$39.95.

Fluid and Electrolytes. Physiology and Pathophysiology. Martin C. Cogan. Appleton and Lange, Norwalk, CT, 1991. xvi, 304 pp., illus. Paper, \$25. A LANGE Medical Book.

Fluid Catalytic Cracking 2. Concepts in Catalyst Design. Mario L. Occelli, Ed. American Chemical Society, Washington, DC, 1991. x, 374 pp., illus. \$79.95. ACS Symposium Series, 452. From a symposium, Washington, DC, Aug. 1990.

Gastrointestinal Microcirculation. K. Messmer and F. Hammersen, Eds. Karger, New York, 1990. x, 222

pp., illus. \$179.25. Progress in Applied Microcirculation, vol. 17. From a symposium, Bad Schachen, F.R.G., June 1989.

General Energetics. Energy in the Biosphere and Civilization. Vaclav Smil. Wiley, New York, 1991. xiv, 369 pp., illus. \$69. Environmental Science and Technology. A Wiley-Interscience Book.

Genetic and Physical Mapping. Kay E. Davies and Shirley M. Tilghman, Eds. Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, 1990. viii, 189 pp., illus. \$35. Genome Analysis, vol. 1.

Genetics and Biotechnology of Bacilli. Vol. 3. Mark M. Zukowski, A. T. Ganesan, and James A. Hoch, Eds. Academic Press, San Diego, CA, 1990. xii, 419 pp., illus. \$59. From a conference, Pacific Grove, CA, July 1989.

Geometry in Condensed Matter Physics. J. F. Sadoc, Ed. World Scientific, Teaneck, NJ, 1990. xiv, 283 pp., illus. \$67. Directions in Condensed Matter Physics, vol. 9.

The Geometry of Biological Time. Arthur T. Winfree. Springer-Verlag, New York, 1990. xiv, 530 pp., illus. Paper, \$32. Springer Study Edition. Reprint, 1980 ed.

Global Patterns. Climate, Vegetation, and Soils. Wallace E. Akin. University of Oklahoma Press, Norman, 1991. x, 370 pp., illus. \$45.

Greenhouse and Energy. D. J. Swaine, Ed. Commonwealth Scientific and Industrial Research Organization, East Melbourne, Australia, 1990. x, 482 pp., illus. \$70. From a conference, North Ryde, Australia, Dec. 1989.

Harry Kirke Wolfe. Pioneer in Psychology. Ludy T. Benjamin, Jr. University of Nebraska Press, Lincoln, 1991. xvi, 200 pp., illus. \$30.

Helping People Change. A Textbook of Methods. Frederick H. Kanfer and Arnold P. Goldstein, Eds. 4th ed. Pergamon, New York, 1991. xii, 488 pp. \$65; paper, \$24.50. Pergamon General Psychology Series, vol. 52.

Hubbard Model and Anyon Superconductivity. A. P. Balachandran et al. World Scientific, Teaneck, NJ, 1990. viii, 138 pp., illus. \$34; paper, \$16. Lecture Notes in Physics, vol. 38.

The Human Nervous System. Introduction and Review. Charles R. Noback, Norman L. Strominger, and Robert J. Demarest. 4th ed. Lea and Febiger, Philadelphia, PA, 1991. viii, 448 pp., illus. Paper, \$34.50.

Human Osteology. Tim D. White. Illustrations by Pieter Arend Folkens. Academic Press, San Diego, CA, 1991. xx, 455 pp. \$59.95.

Immunodiagnosis of Cancer. Ronald B. Herberman and Donald W. Mercer, Eds. 2nd ed. Dekker, New York, 1990. xxii, 712 pp., illus. \$150. Immunology Series, 53.

Immunological Methods. Vol. 4. Ivan Lefkovits and Benvenuto Pernis, Eds. Academic Press, San Diego, CA, 1990. xxviii, 338 pp., illus. \$69.

In Search of the Indo-Europeans. Language, Archaeology and Myth. J. P. Mallory. Thames and Hudson, New York, 1991 (distributor, Norton, New York). 288 pp., illus., + plates. Paper, \$18.95. Reprint, 1989 ed.

Industrial Solvents Handbook. Ernest W. Flick, Ed. 4th ed. Noyes, Park Ridge, NJ, 1990. xxvi, 930 pp., illus. \$145.

International Perspectives on Self-Regulation and Health. John G. Carlson and A. Ronald Seifert, Eds. Plenum, New York, 1991. xviii, 291 pp., illus. \$59.50. Plenum Series in Behavioral Psychophysiology and Medicine.

International Quarantine. Oleg P. Schpin and Waldemar V. Yermakov. International Universities Press, Madison, CT, 1991. x, 344 pp. \$40. Translated from the Russian by Boris Meerovich and Vladimir Bobrov.

Interstellar Travel. Past, Present, and Future. John W. Macvey. Scarborough House, Chelsea, MI, 1991. xviii, 253 pp., illus. Paper, \$11.95. Reprint with revisions, 1977 ed.

An Introduction to Linear Algebra. L. Mirsky. Dover, New York, 1990. viii, 440 pp. Paper, \$10.95. Reprint, 1961 ed.

Introduction to Minimax. V. F. Dem'yanov and V. N. Malozemov. Dover, New York, 1990. viii, 307 pp., illus. Paper, \$8.95. Translated from the Russian edition (Moscow, 1972) by D. Louvish. Reprint, 1974 ed.

Laura. A Case for the Modularity of Language. Jeni E. Yamada. MIT Press, Cambridge, MA 1991. xviii, 169 pp., illus. \$27.50. A Bradford Book. Issues in the Biology of Language and Cognition.

Megakaryocytes, Platelets, Macrophages, and Eosinophils. J. R. Harris, Ed. Plenum, New York, 1991. xiv, 349 pp., illus. \$79.50. Blood Cell Biochemistry, vol. 2.

Molecular Insect Science. H. H. Hagedorn et al., Eds. Plenum, New York, 1990. x, 407 pp., illus. \$89.50. From a symposium, Tucson, AZ, Oct. 1989.

Morphogenetic Hormones of Arthropods. Vol. 1. Part 2, Embryonic and Postembryonic Sources. A. P. Gupta, Ed. Rutgers University Press, New Brunswick, NJ, 1991. xii, 533 pp., illus. \$125. Recent Advances in Comparative Arthropod Morphology, Physiology, and Development.

The Natural Sciences and American Scientists in the Revolutionary Era. A Bibliography. Katalin Hankanyi, Ed. Greenwood, New York, 1990. xiv, 510 pp. \$65. Bibliographies and Indexes in American History, no. 17.

The Numerical Solution of Two-Point Boundary Problems in Ordinary Differential Equations. L. Fox. Dover, New York, 1990. xii, 371 pp. Paper, \$9.95. Reprint, 1957 ed.

Occupational Biomechanics. Don B. Chaffin and Gunnar B. J. Andersson. 2nd ed. Wiley, New York, 1991. xx, 518 pp., illus. \$49.95. A Wiley-Interscience Publication.

On Truth. Original Manuscript Materials (1927-1929) from the Ramsey Collection at the University of Pittsburgh. Frank Plumpton Ramsey. Nicholas Rescher and Ulrich Majer, Eds. Kluwer, Boston, MA, 1991. xxii, 129 pp. \$59. Episteme, vol. 16.

Oriented Crystallization on Amorphous Substrates. E. I. Givargizov. Plenum, New York, 1991. xii, 370 pp., illus. \$85. Microdevices. Physics and Fabrication Technologies.

Ovarian Secretions and Cardiovascular and Neurological Function. F. Naftolin et al., Eds. Raven, New York, 1990. xii, 319 pp., illus. \$88. Sero Symposia Publications, vol. 80. From a symposium, Aug. 1989.

Path Integrals in Quantum Mechanics, Statistics, and Polymer Physics. Hagen Kleinert. World Scientific, Teaneck, NJ, 1990. xxii, 664 pp., illus. \$86; paper, \$42.

The Penguin Dictionary of Chemistry. D. W. A. Sharp, Ed. 2nd ed. Penguin, New York, 1991. 434 pp., illus. Paper, \$9.95. Penguin Reference Books.

Quantitative Theory in Soil Productivity and Environmental Pollution. D. J. Greenwood, P. H. Nye, and A. Walker, Eds. Royal Society, London, 1990. viii pp. + pp. 309-428, illus. £37.50. From a meeting, London, March 1990. Reprinted from *Philosophical Transactions of the Royal Society, Series B*, vol. 329 (1990).

Radical Ionic Systems. Properties in Condensed Phases. A. Lund and M. Shiotani, Eds. Kluwer, Boston, MA, 1991. x, 496 pp., illus. \$149. Topics in Molecular Organization and Engineering, vol. 6.

Real Analysis. Norman B. Haaser and Joseph A. Sullivan. Dover, New York, 1991. x, 341 pp. Paper, \$8.95. Reprint, 1971 ed.

Relativistic Quantum Mechanics of Leptons and Fields. Walter T. Grandy, Jr. Kluwer, Boston, MA, 1990. xii, 438 pp., illus. \$99. Fundamental Theories of Physics, vol. 41.

Rules of Thumb for Engineers and Scientists. David Fisher, Ed. Gulf, Houston, TX, 1991. xiv, 242 pp., illus. \$28.95. Reprint with revisions, 1988 ed.

Social Comparison. Contemporary Theory and Research. Jerry Suls and Thomas Ashby, Eds. Erlbaum, Hillsdale, NJ, 1991. xvi, 431 pp., illus. \$69.95; paper, \$34.50.

12th International Congress on X-ray Optics and Microanalysis. Cracow 12 ICXOM. S. Jasienska and L. J. Maksymowicz, Eds. Academy of Mining and Metallurgy, Cracow, Poland, 1989 (distributor, American Institute of Physics, New York). 2 vols. 929 pp., illus. Paper, \$110. From a congress, Cracow, Poland, Aug. 1989.

The Two-Edged Sword. A Study of the Paranoid Personality in Action. William H. Hampton and Virginia Schroeder Burnham. Sundial (Sunstone), Santa Fe, NM, 1990. 144 pp. Paper, \$14.95.

Waterfowl Ecology. Myrfin Owen and Jeffrey M. Black. Blackie, London, and Chapman and Hall (Rutledge, Chapman, and Hall), New York, 1990. x, 194 pp., illus. \$71.50; paper, \$35. Tertiary Level Biology.

The Weak Interaction in Nuclear, Particle and Astrophysics. K. Grotz and H. V. Klapdor. Hilger, Philadelphia, PA, 1990 (distributor, American Institute of Physics, New York). xiv, 461 pp., illus. \$120. Translated from the German edition (Stuttgart, 1989) by S. S. Wilson.

Zoologisches Wörterbuch. Tiernamen, Allgemeinbiologische, Anatomische, Physiologische Termini und Biographische Daten. Erwin Hentschel and Günther Wagner. 4th ed. Fischer, Stuttgart, G.D.R., 1990. 573 pp. Paper, DM 36.80.