

collections and microscopes, histology and pathology courses are all headed toward computer-based learning. A major complaint about computer images is the inability to scan a slide and identify the context of a specific image. The author addresses this problem by presenting each image at low magnification and then providing multiple areas available at higher magnification. There are also anatomical diagrams that illustrate where the slides were generated, and each image has thorough labeling of specific cells and structures. All of the features are accessed by intuitive mouse commands. The accompanying text emphasizes how the structures reflect function. A thumbnail image of each slide is placed in the book to help guide students to the appropriate image. Specific goals for each section and new vocabulary are clearly stated, an attractive feature for modern students. The text and images are separated by organ systems and can be accessed through a comprehensive index. This combination of text and computer-based imagery eliminates the need for a histology atlas that is usually recommended to accompany most histology volumes, and the cost is no more than a well-illustrated book. There are no clinical correlations included in this volume, something that is now emphasized in most modern histology courses, but this could easily be added in a future edition.

This computer-based volume for learning histology is both an excellent book for students and a useful reference and atlas of histology. Vaughan has generated a work that will set the standard for computer-based learning of histology in the years to come.

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METAL IONS IN BIOLOGICAL SYSTEMS. *Volume 39: Molybdenum and Tungsten: Their Roles in Biological Processes.*

*Edited by Astrid Sigel and Helmut Sigel. New York: Marcel Dekker. \$250.00. lxi + 810 p; ill.; subject index. ISBN: 0-8247-0765-6. 2002.*

BIOLOGICAL SYSTEMS UNDER EXTREME CONDITIONS: STRUCTURE AND FUNCTION. *Biological and Medical Physics Series.*

*Edited by Y Tamiguchi, H E Stanley, and H Ludwig. Berlin and New York: Springer. \$74.95. xii + 282 p; ill.; subject index. ISBN: 3-540-65992-7. 2002.*

Using spectroscopic methods, the structure and function of systems under extreme pressures and temperatures can now be investigated. This book describes the theory and applications of these effects.

EARLY LIFE: EVOLUTION ON THE PRECAMBRIAN EARTH. *Second Edition.*

*By Lynn Margulis and Michael F Dolan. Sudbury (Massachusetts): Jones and Bartlett Publishers. \$34.95 (paper). xxiv + 168 p; ill.; index. ISBN: 0-7637-1463-1. 2002.*

The study of early life is exceedingly interdisciplinary, and the authors draw from the fields of cell biology, chemistry, ecology, geology, paleontology, and climatology to paint a history of life. The book is written for nonscientists and many basic concepts (such as mitosis and meiosis) are clearly explained. It is arranged in six chapters that emphasize cellular evolution in a changing environment: evolution of cells, life without oxygen, life with oxygen, a new kind of cell, evolution of sex, and the modern era. The text is interspersed with historical details and suggested readings, and there is a useful glossary and index.

Margulis is known for her research on eukaryotic cells and especially their origin through symbiosis. Naturally, this topic is highlighted in the book. The authors detail evidence supporting the serial acquisition of cellular components such as undulipodia (flagella, cilia) for motility, mitochondria for respiration, and plastids for photosynthesis. Although nearly all biologists accept the symbiotic origins of mitochondria and plastids, many molecular evolutionists reject the notion that an earlier symbiotic event occurred. The current molecular evidence against the full "serial endosymbiosis theory" is weak, and I side with the authors on this matter. I also agree with their use of the "unpopular" terms Archaeobacteria and Eubacteria for the two major groups of prokaryotes, instead of "Archaea" and "Bacteria" (respectively). The word "bacteria" is ingrained in the English language as being synonymous with all prokaryotes and, therefore, using it to formally recognize one group of prokaryotes has created confusion. Margulis and Dolan show that Woese's three-domain system is compatible with a prokaryote-eukaryote distinction, so I applaud the authors for ignoring the status quo.

I have only one mild criticism. A future revision would benefit from consultation or collaboration with a molecular evolutionist, because some of the major advances from molecular phylogenies and clocks are conspicuously absent in this edition. Nonetheless, I wholeheartedly recommend the book for interested nonscientists and even seasoned researchers who would like a refreshing overview of an interdisciplinary topic so fundamental to our understanding of life.

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