

Although the authors include "fate" in the title of this book, they do not separately address this subject. Regulatory agencies examine the fate of a chemical by evaluating its negative impact on ecosystems and humans and requiring its removal in engineered treatment systems. Hemond and Fechner incorporate impact on ecosystems throughout the text in discussions on oxygen sag curves in rivers, bioaccumulation, and global warming, but they do not address effects of chemicals on humans or organisms using dose-response models or treatment in engineered systems.

Despite some shortcomings, this text maintains an overall focus on chemical mobility in the natural environment. The problems at the end of each chapter are realistic and can build insight into aspects of chemical dispersal in the natural environment. Scientists trained in other fields will find the survey of quantitative aspects of transport interesting and a good introduction to this subject. Those who are looking to survey topics related to environmental transport, rather than delve at depth into any one aspect, will find Hemond and Fechner's book an informative resource.

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SANDGREN, C. D., J. P. SMOL, AND J. KRISTIANSEN [EDS.]. 1995. **Chrysophyte algae: Ecology, phylogeny and development.** Cambridge Univ. Press, New York. ISBN 0-521-46260-6. 399 p. \$79.95.

In the tradition of comprehensive organismic biology, Craig D. Sandgren and his colleagues have assembled within one volume a treatment that will both sate and inspire the devotees of Chrysophyte science. Packed into 400 pages, that text spans the gamut from biomineralization and development to ultrastructural cytology and zooplankton herbivory. The book will attract students of electron micrography as well as theorists of evolution and phylogeny and will confront all readers with the biological realities of an enigmatic and diverse taxon that has resisted laboratory culture studies until recently.

The book includes 17 chapters drawn mainly from the plenary addresses presented at the 3rd International Chrysophyte Symposium at Queen's University in 1991. Kristiansen develops within the introductory chapter a delightful, personable account of the history of chrysophyte research with careful attention to the leaders and personalities who dominated the field during its 200-year existence. The essay serves as a fine overview of general themes and lines of investigation that can be recognized in subsequent chapters. The body of the text is divided into three main parts dealing with phylogeny, systematics, and evolution; development, physiology, and nutrition; and ecology, paleoecology, and reproduction. The work concludes with four contributed papers which fit well within the established themes.

The treatments of systematics include a new classification scheme of the Chrysophyceae, Dictyochophyceae, and Synurophyceae erected by H. R. Preisig using inferences from morphology, ultrastructure, pigments, and other biochemical properties. Alternative phylogenetic inquiries based on the molecular

systematics of ribosomal RNA and amino acid sequences for Rubisco are presented through the work of DeLaney, Hardison, and Cattolico.

J. A. Raven provides a masterly overview of chrysophyte metabolism and nutrition with respect to carbon, nitrogen, and phosphorus, and the chapter is complemented by a second in which experimental investigations of the group famous for its mixotrophic tendencies are presented by Holen and Boraas. Silica metabolism, biomineralization, and developmental processes related to spine and scale production are treated in several chapters.

Owing to their durable cysts and the success of some species in low pH waters, chrysophytes have moved to center stage in efforts to measure and reconstruct neo- and paleo-pH from stratigraphic records. J. P. Smol, P. A. Sivers, and others document the taxonomic shifts along environmental gradients and demonstrate how the physiological tolerances and ecological successes can be exploited as a proxy clue. Sandgren and Walton carry the inquiries about chrysophyte distribution and biogeography to an even higher level of trophic interaction. They offer experimental evidence that herbivory, especially by large *Daphnia*, is perhaps the main factor governing the distribution and abundance of chrysophyte algae in general. The work also presents intriguing results about the defensive value of siliceous spines against some grazers, obtained by experimentally manipulating in culture the presence or absence of the structures.

The individual chapters are richly referenced, and the text is an excellent source for the mass of original literature cutting across all chrysophyte biology. The volume is free of any evident technical errors; the illustrative material and figures are well done, and the EM plates are quite legible. Overall the book rates highly for its information content and its smooth-reading prose.

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ALLAN, J. D. 1995. **Stream ecology.** Structure and function of running waters. Chapman & Hall, New York. ISBN 0-412-35530-2. 388 p. [softcover] \$44.95.

In 1970, H. B. N. Hynes published "The ecology of running waters," which was the first comprehensive treatment of stream ecology. During the intervening years there has been tremendous growth in this area as evidenced by numerous journal articles as well as specialized books treating various aspects of lotic ecology. Undoubtedly, this growth can be attributed in part to the enormous success of Hynes' text. J. D. Allan now provides us with a highly useful new book that summarizes much of the progress in stream ecology in the last 25 years. Allan's task included coverage of many topics that define the current lines of inquiry in stream ecosystems, but which had not been thought of in 1970, attesting to the rapid pace of growth in this field. These topics include the river continuum concept, cascading trophic interactions, nutrient spiraling, hydraulic transient storage, dynamics of dissolved and particulate organic carbon, algal-herbivore interactions, microbial loops, effects of disturbance, and functional feeding groups. Reading Allan's text, one is treat-