

Sedimentary Organic Matter: Organic facies and palynofacies

edited by **R.V. Tyson**, published by Chapman & Hall, 2-6, Boundary Row, London SE1 8HN, UK in 1995, ISBN 0-412-36350.

Review by Christopher G. Kendall

This book is aimed at geoscientists interested in organic matter in sedimentary rocks, but does not pretend to be a book on either sedimentology or the taxonomy of the organisms that produce the organic matter we find in sediments. Instead it deals with the broad generalities of organic matter in sediments. The general organization of the theme of the book and its style make it an easy book to read. The author's objective was that the text be of use to post-graduate and professional scientists in both academia and industry who have interest in organic matter and sediments, rather than a text for beginners. However, the book is so clearly written that it could be used by undergraduates. Nevertheless information presented by the author goes beyond that needed for undergraduate courses, possibly even those of the graduate level. Certainly it is sufficiently well organized that beginners can scan through it gaining an understanding of the role of organic materials in sediments. Should more information be required they can read specific chapters in greater depth and if this information is not comprehensive enough they can use the extensive bibliography which is attached to this volume.

The book has some 25 chapters and begins with the origin and nature of organic matter in sediments. It considers how this material can be degraded or consumed biologically; how the abundance of organic matter is measured; when most of it is preserved; and how it is preserved. Most of the book is concentrated on the origin and nature of the different organisms that produce organic matter, their distribution and preservation. Thus one can gain an understanding of how a particular group of organisms produce organic matter, the type of product that they manufacture and how this is distributed in the rock record. Chapters include discussions of phytoclasts, amorphous organic matter, palynomorphs and phytoplankton groups, zoomorphs, etc. from the perspective of their origin and distribution. The final chapters of the book focus on such things as kerogen classification, bulk chemical characterization and classifications using elemental analysis and pyrolysis, carbon:nitrogen ratios, lignin-derived phenols, and stable carbon isotopes. To keep in geological fashion the next to final chapter of the book describes the use of palynofacies in sequence stratigraphic analysis. The last chapter is on the practical aspects of palynofacies analysis including sampling strategy, data collection, graphic representation of measurements, etc. There are a number of appendices dealing with particulate organic matter, isotopic composition, carbon:nitrogen weight ratios, and prasinophyte occurrences in the dysoxic-anoxic facies of Silurian to Quaternary age.

This is an impressive book which has a coherent and sharply written style. The illustrations are not over abundant but they are clear to the point and lend weight to the text. There are a number of color plates towards the end of the book, illustrating the various kinds of organic matter, ranging from translucent and opaque phytoclasts, amorphous materials, palynomorphs and zooclasts. The book touches on most things organic and sedimentary including the origin of petroleum, consideration of florescence, paleo-environmental analysis, discussion of kerogen relationships to Rock-Eval, optical classifications, etc. However the book was not written to focus on chemical and hydrocarbon implications but, as the title suggests, is more genuinely a book on organic matter in sediments. I would guess that this will be a text read by many graduate students at universities, while finding its way to the personal shelves of many sedimentologists and paleonologists, geochemicists and stratigraphers. The book

really does provide a solid foundation of data and concepts. The purpose of the author was to bridge the gap between the various subdisciplines involved with this topic and I think that he has done this. The book will help in the interpretation of depositional environments, one's understanding of why certain organic materials are preserved, will help explain the concentrations of organic matters related to rapid marine transgressions, or maximum flooding surfaces associated with sequence stratigraphic model, etc. Richard Tyson should be congratulated on a really fine text and Chapman and Hall for providing him with the medium to do this. This is a really great and comprehensive book.