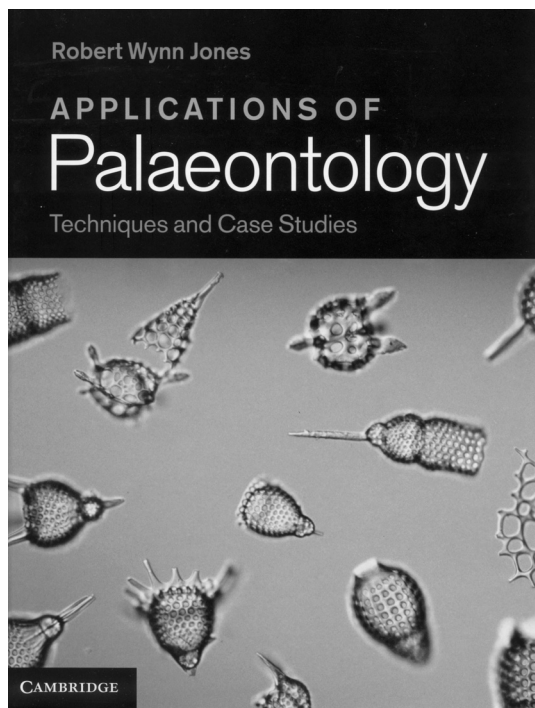


Applications of palaeontology – techniques and case studies, by Robert Wynn Jones, 2011. Cambridge University Press (www.cambridge.org/uk/bookshop/). Hardback, xiv + 406 pages. Price GBP 80.00. ISBN 9781107005235.



Contemporary palaeontological research is being progressively threatened by the marked decline of funding levels and oil-company support for palaeontologists. The side effects of this general trend are easy to notice. Taxonomic expertise is subjected to constant erosion and the average palaeontologist becomes older (Flessa & Smith, 2000). The decline in the intensity of palaeontological studies worries specialists who try to predict the future trends in palaeobiological studies (Plotnick, 2007).

There are still many possibilities, however. The report on the workshop 'Future research directions in paleontology', organised in 2006 by the Paleontological Society, states that it is crucial to emphasize the unique insights that palaeontological studies can provide to society, for instance in the form of input for numerous other areas of science, and also because of the wide range of possible applications of palaeobiological research (Bottjer, 2007).

This broad range of subjects is at least partially covered in this book, which can be considered as the successor of another book by the same author (Jones, 2006). Many figures are

reproduced from this earlier book and readers might feel somewhat confused. Despite these apparent similarities, the range of subjects covered by both books differs substantially, with the new book revolving around examples of practical usage of palaeontological studies in various industries, some of which are not directly related to geology and environmental sciences.

Jones gracefully introduces the reader to the principles of biostratigraphy. The biostratigraphic significance of the main fossil groups, from cyanobacteria and plant like protists to trace fossils and vertebrates, is summarised. Their possible palaeoenvironmental interpretations are also clearly outlined. The author emphasizes the importance of palaeobathymetric studies, especially in the case of fossil groups that lived in marginal and shallow-marine environments. Additionally, he summarises the key evolutionary and extinction events in Earth history and the importance of fossil taxa in palaeobiogeographical interpretations.

The detailed description of biostratigraphic techniques is accompanied by a short description of related methods, from chemostratigraphy to radiometric dating and Quaternary dating methods. Moreover, comprehensive information on the entire stratigraphic column (from Cambrian to recent) is also included. The book therefore serves as a powerful guide to the principles of the biostratigraphy.

A separate chapter covers topics related to the integration of palaeontological data into sequence-stratigraphic interpretations. The author discusses techniques that facilitate the identification of key surfaces and the description of systems tracts. Systems tracts in the Neogene of southern Asia, the Paleogene of Arctic Canada and the Cretaceous of the Middle East are palaeontologically characterised in detail.

In the following chapters, the author describes applications of palaeontology in petroleum geology, mineral exploration and coal mining. The reader is presented with a set of

carefully selected case studies which are used to discuss the palaeontological input to petroleum systems analysis and palaeobiological controls of source and reservoir rock development. The petroleum geology of the Middle East, the North Sea, northern South America and the Indian subcontinent serves as a background. Additionally, the Carboniferous stratigraphy of Great Britain is used to demonstrate the potential of palaeobiological studies in coal geology and mining.

The possible application of palaeontology in engineering geology is also discussed. Case studies from all over the world are described shortly. The author focuses on applications of micropalaeontology in site investigation and on seismic-hazard assessment. Additionally, many case studies related to the assessment of environmental impacts are included.

The book is supplemented with a chapter devoted to other applications of palaeontology, not related directly to geological sciences. The author discusses the possible usage of fossils in archaeology, providing a brief insight into archaeostratigraphical methods and environmental archaeology. The focus is placed primarily on palynology, in order to obtain data that can be calibrated against the radiocarbon record; and on the palaeoenvironmental and palaeoclimatic reconstructions that provide a framework for studying and understanding the environmental context of archaeological sites. Other applications of palaeontology in sciences unrelated to geology are also briefly mentioned. The possible usage of spores and pollen seems to be particularly comprehensive;

the author cites examples of successful applications of forensic palynology, entomopalynology and medical palynology.

At the end of the book, the reader is equipped with a huge database of possible uses of palaeontology, accompanied by scrupulously described examples. The great diversity of the examined case studies leads to the conclusion that even highly experienced palaeontologists can enrich their knowledge. However, the value of the book would have gained if the author had provided more examples of possible applications of palaeontology that go beyond pure biostratigraphic studies, which can be pretty obvious for many readers. On the other hand, most of other case studies described would not be possible to conduct without detailed biostratigraphic research.

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