

# ***Principles of Terrane Analysis: New applications for Global Tectonics***

by **David G. Howell**, published by Chapman & Hall, 2-6 Boundary Row, London Se1 8HN, UK, in 1995, ISBN 0-412-54640-X.

## **Review by Christopher G. Kendall**

This text represents a successful attempt to take a complex subject, namely terrane analysis and the rapidly evolving field of plate tectonics, and express them in simplified non technical language. The book navigates this complexity with a number of very simple clear maps and diagrams. The narrative of the book is light hearted while being a serious compilation of ideas and concepts which have been woven together by David G. Howell to form a comprehensible and much simplified book. The authors enthusiasm shines through this succinct and clear text. Occasional jokes in the text show the spirit of the author and do not detract from the subject matter. This is a book which could be easily be used as a text for advanced undergraduates or graduate level students, but also will be a great interest to hydrocarbon explorationists and those who are exploring for metallic ores. Experts in plate tectonics and terrane analysts may find this synthesis extremely useful to them, since it provides a mean of codifying plate tectonic concepts into a comprehensible format. You could read through this book in an afternoon, as I did, and acquire some feel for its subject matter. While one could not call this book a light read, the diagrams and maps are clear, and global tectonics are handled in an immensely readable way.

The book is divided into 7 chapters. It begins by explaining the relationship between oceans, continents, mountain building, thermally thickened crust, continental growth, etc. The second chapter develops the history and understanding of plate tectonics and shows how this topic has progressed from the concepts of Alfred Wegner to the hypotheses of Harry Hess and Tuzo Wilson, showing how the work of Vine and Matthews was eventually used to explain models for tectonic plate movement. From these simple beginnings, the text moves onto a discussion of the history of continental growth together with suspect terranes. It considers why these terrane should be even considered to exist, how their nomenclature works, how they are formed, and how they have evolved from the Precambrian to their present form.

There is a discussion of kinematics and measurement of terrane displacements using direct measurements, magnetic lineations, paleomagnetism, paleontology, movement along fault planes, etc. There is a chapter on mountain building and the shaping of continents. It tracks tectonic settings from Taiwan to Timor, the Himalayas, the Tibetan Plateau, the African/European collision zone, the Cordillera of North America, etc. There is a short chapter on how field data can help unravel the history of tectonic terranes and their relationship to adjacent terranes. It discusses the strategies needed in field mapping and how terrane analysis can be applied to hydrocarbon and mineral exploration. The book ends with a philosophical paragraph in which Howell expresses the hope that questions he posed were answered, feeling his book may have tended to generate more questions than answers. He points out that there still remains much to do in geology, particularly in the unraveling of the relationships between different tectonic terranes.

The book is well written and will probably end up on the shelves of many petroleum and mineral explorationists, paleogeographers, structural geologists, seismologists, etc, including undergraduate and graduate students. This is a great book, though its simplifications may be too great for an expert, one should not underestimate its importance from its size.