

BOOK REVIEWS

New periodical

Dewey, J. F., Tapponnier, P. E. & Burchfiel, B. C. (editors). *Tectonics*. Published bimonthly by the American Geophysical Union and the European Geophysical Society. (contact AGU for subscription information)

The first issue of *Tectonics*, which appeared in February 1982, contains a statement of editorial policy. The journal seeks papers on the 'structure, origin and evolution of the lithosphere with particular emphasis on the continents'. Its theme is the 'mechanical and thermal evolution of the lithospheric crust and mantle and the way this is reflected in cratons, basins, and mountains . . .'. The statement goes on to list a range of topics including the origin, secular evolution and growth of the crust; modelling and neotectonic studies of the continental lithosphere; rifts and basins; convergent zones; and ' . . . regional, analytical, synthetic and integrative tectonics . . .'. The editors clearly intend to cover one of the most exciting and rapidly growing areas of geology: the development of rigorous predictive models of behaviour of the crust and lithosphere on a scale one step down from that of plate tectonics. Papers on these topics have been dispersed among a range of geological and geophysical journals, and *Tectonics* will perform a useful function if it gathers them together and brings them to the attention of a wider geological audience. Hence the journal fills an identifiable niche; but what of the other occupants? The most obvious competitor is *Tectonophysics*, and there are areas of overlap with the *Journal of Structural Geology*, and with several geophysical and petrological journals.

Papers in the first issue cover the plate-tectonic evolution of Antarctica, models of a lithosphere containing density heterogeneities, measurements of strain and palaeostress in a subduction complex, crustal seismicity in the light of rock-mechanics data, and geometry and subsidence history of pull-apart basins. The mix is different from *Tectonophysics*, but sufficiently similar that the new journal will need to compete on other grounds as well. This the editors clearly intend: they aim for a review time of one month, and a (1982) price of U.S. \$20 for AGU and EGS members. I also hope that *Tectonics* will develop a more clearly defined scope and a more coherent editorial policy than *Tectonophysics*.

The new journal is reproduced from camera-ready copy produced by authors. The quality of the final product is uniform and good, though there is a higher incidence of error than in most typeset journals that go through a proof stage. Line-drawings are generally well produced, though there is the usual problem of stipple tones clotting or fading due to reduction. Photographs have suffered from the fairly poor-quality paper used—comparable in surface texture to *Nature*, and worse than the majority of geological journals, including *Tectonophysics* and *Journal of Structural Geology*.

Three questions, arising out of the stated aims of the journal, occur to me.

(1) Will it be able to maintain a clear sense of direction in a subject that has its roots in every aspect of the earth sciences, and which is also susceptible to speculation and fashion?

(2) How will the rapid-review policy affect the quality of the published papers? At least one of the more specialist papers in the first issue seems to me to be in need of more critical treatment. If the journal is aiming for rapid publication of controversial and topical papers (like *Geology*), will they make space for critical discussions, as *Geology* does?

(3) How will *Tectonics* approach research in structural geology? It is ironic that I was asked to write this review at a meeting of the Tectonic Studies Group, now the principal forum for structural geologists in western Europe; yet scarcely one in ten of the presentations at that meeting would be explicitly covered by the stated scope of the journal. Observational and analytical structural geology traditionally provided much of the data-base for tectonics.

Since the advent of plate tectonics, with its firm base in geophysics, there has been an increasing communication gap between the practitioners of large-scale tectonics and those of structural geology, particularly in the U.K. I hope that *Tectonics* will try to bridge this gap.

I think that a journal like *Tectonics* is needed; I wish the editors success, and I hope the journal survives in the present icy economic climate.

J. P. Platt

Plate tectonics

Condie, K. C. 1982. *Plate Tectonics and Crustal Evolution* (Second Edition). Pergamon Press, Oxford. 310 pp. Coloured Tectonic Map of the World. Price: hardcover £32.50, paperback £13.10.

Teachers of courses in tectonics, and earth scientists who require a quick update in areas of tectonics outside their own expertise, will welcome this thoroughly revised edition of Kent Condie's popular text *Plate Tectonics and Crustal Evolution*. It is a measure of the pace of research, with the accumulation of new data and the rapid development of ideas in tectonics, that a second edition of Condie's book should have become necessary only six years after the publication of the first. Those familiar with the first edition will know that the text is aimed at advanced undergraduate and post-graduate students of the Earth Sciences who are taking courses in Tectonics.

In the first five chapters the author outlines the scope of his subject and its methodology, giving a résumé of present knowledge of the Earth-Moon system and the nature of the Earth's core, mantle and crust. Chapters 4 and 5 give a detailed account of techniques which have been used to explore the crust and on the basis of composition and structural characteristics, the author identifies ten types of crustal province. While the early chapters provide a wealth of factual information, and are useful for reference, they are difficult to read as the author does not make clear where all this data is leading us. Each aspect is dealt with as though it represented a separate and unrelated body of factual information. It is only in Chapter 6 'Sea-floor Spreading' that the main theme of the book becomes apparent and the text becomes considerably more readable. In Chapter 7 'Magmatic Associations', the author is clearly in his own area of expertise and provides an excellent summary of current thinking on the origin of magmas and their relationships to different tectonic environments, on the basis of geochemical data. The following chapter (8) 'Continental Drift and Plate Tectonics', includes a useful section on the relationships between tectonic environments and the occurrence of economic deposits of minerals and hydrocarbon accumulations.

Chapter 9 outlines movements of the continents during the Phanerozoic using the palaeomagnetic compilations of Scotese *et al.* (1979) and continues with brief descriptions of Phanerozoic mobile belts, including the Appalachian-Caledonian, Hercynian, Cordilleran and Alpine systems, in terms of plate tectonics. Inevitably, given the scope of the book, the treatment of this important aspect is somewhat superficial and fuller descriptions of their structural evolution, and discussion of the mechanisms by which they were formed would have been welcome. In particular, in his account of the North American Cordilleran system, the author deals cursorily with the concept of 'suspect terranes' (Coney *et al.* 1980); terranes allochthonous to the North American craton, accreted to the continental margin from the Pacific side since Triassic times. From his account, it is clear that the author has not assimilated the full significance of this new paradigm, which provides an explanation for the many anomalous features which result from the application of simple plate-tectonic models to the interpretation of ancient mobile belts, and gives new meaning to long-held concepts such as the 'orogenic cycle'. In any future revision this theme will surely be more fully developed.

For the final chapters of his book the author considers the evolution of the continental crust through time, and in particular its origin the Precambrian, with the development of the oceans and the atmosphere, and the associated origin and evolution of life. Chapter 10 is particularly valuable and thought-provoking, bringing together and expanding sections, which were scattered through the earlier edition, to form a new chapter on the Precambrian crust. An excellent summary is given of the Archaean provinces and Proterozoic rock associations, but