Pergamon

Journal of Structural Geology, Vol. 16, No. 8, pp. 1187 to 1189, 1994
Elsevier Science Ltd
Printed in Great Britain

BOOK REVIEWS

Overview of the Earth

Rogers, J. J. W. 1993. *A History of the Earth*. Cambridge University Press, Cambridge, England. 312 pp. Price: hardback £50.00; $89.95; paperback £22.95; $39.95.

Stop! Read no further! Get a pencil and paper and write down what *you* would include in the contents list if you were to write a book entitled *A History of the Earth*. Done that? OK, you may now read on.

If you are like me, you will have in front of you a seemingly endless list of possible topics which wander haphazardly from space and planetary accretion, through changes in plate tectonic and magmatic scenarios from the Archean to the present time, into missing links and global climate changes. You will also have a separate list where you have jotted down all the topics you cannot quite find a home for; *K–T* boundary, eustacy, geomorphology, sedimentary processes, mineralization. Need I go on?

It turns out to be a non-trivial question, and John Rogers is to be congratulated on his imaginative answer to it. The basic framework for any book that is "a broad introduction to this vast subject for all interested in the study of the Earth" has to be time, and that framework should focus the discussion of the evolution of both the lithosphere and the biosphere. This is indeed the pattern of this book, but, I must admit, not set out in the way that I was expecting.

The opening chapter, *Geologic Time*, lays the foundation naturally enough; discussing time from a radiometric, stratigraphic and biological point of view. Chapter 2, *Principal controls on Earth History*, homes in from the accretion and fractionation of the Earth, through the growth of oceanic and continental crust into sealevel changes. A discussion of how different the Earth was in Archean times precedes the chapter that will be of most interest to *JSG* readers, *Processes in a Rigid Lithosphere*. Most tectonic processes are touched on here, but the discussion is largely (and appropriately) held on a plate tectonic scale. There seems to be a clear preference for tectonic processes which help magmatism along.

From then onwards, the Proterozoic, Paleozoic (sic), Mesozoic and Cenozoic are discussed sequentially but from two contrasting standpoints; what was happening to life and the biosphere, and the tectonic evolution of the continents. The approach works well for the Palaeozoic, where life and lithosphere are dealt with in two chapters, but verges on the jumbled for the Earth's last 300 Ma. For me, the organization of the latter chapters is the weakest aspect of the book. I would have preferred to see the development of the biosphere through time completely separated from the discussion of lithospheric evolution through time. Perhaps it is just that I am comfortable with the more traditional approach.

Despite these reservations, the lucid style and the exceptionally clear illustrations carry the reader along, and the breadth of information that John Rogers has assembled in a book of just 300 pages is impressive. I particularly liked the light writing style that John adopts throughout. I offer you just two of many examples that made me chuckle; he basks in and alongside "the fine climate and many of the presumably happy organisms of the Cretaceous" before being rudely awoken by a bolide impact, and he astutely observes that "the combination of geology and scenery (perhaps also good restaurants) has invited intense geologic scrutiny of the Alps". I liked too his little asides, scattered throughout the text, that often encapsulate in just a couple of words some of the problems that arise through dodgy data or wobbly logic.

Inevitably when you review a book as broad as this, you find yourself assessing its accuracy by looking at the subjects you are familiar with. I would caution any British Caledonide specialist not to attempt this, because the reconstruction of our beloved region is hopelessly wrong. For example, I was tickled by the southeastward vergence of the Welsh Caledonian "major thrust belt" and the closure of the suture between Scotland and England in "Hercynian/Variscan/Arcadian times". But I do not believe such slips are symptomatic of poor standards generally; merely the sort of inaccuracy that our geologic cousins across the pond like to tease us with from time to time.

In my opinion the book does fall down fairly seriously in one of its stated aims. John hopes that the book "can provide an overview of the Earth for students who will then go directly into a study of a speciality within the earth sciences". It is much too complex in parts to do that. I struggled with Proterozoic biochemistry and Archean terranes, and if I had only a basic grounding in earth science many other aspects of the book would have intimated me, too. But if that is a fault, then it is one made by most who attempt to write to such a daunting brief. It does mean, however, that this book will be of more use to trained rather than training geologists.

Inevitably, there is a strong leaning towards the American way of doing things. We have learned to live with the Pennsylvanian, but in places the paucity of non-American references when subjects of global interest are discussed smacks a little of parochialism. But the good features of this book easily outweigh the less good ones. It is a good read, and I am glad I possess a copy. I know I shall return to it again and again for reference material with a refreshing 1990s approach to earth science. Mischieviously, I found myself wondering, since the book ends so abruptly, if there is to be a sequel. Just when you thought it was safe to go back into the Proterozoic.

Andrew Bell
Milton Keynes, U.K.

Global-scale wrenching

Xu Jiawei (editor) 1993. *The Tancheng-Lujiang wrench fault system*, John Wiley, Chichester, England. 279+xv pp. ISBN 0-471-9332-5. Price: hardback £100.

The Tancheng-Lujiang (or Tan-lu) fault zone (TLFZ) is a major NNE-trending strike-slip fault zone in eastern China. Its ~750 km left-lateral displacement probably developed during a single phase of early Cretaceous activity, with slip rate ~50 mm y^{-1} during ~115–100 Ma. It was discovered in the 1950s by Xu Jiawei. Xu is now Professor of Geology at Hefei University, which is near Lujiang within the TLFZ. He compiled the 19 papers in this book following a symposium which he organized in 1989.

Luijiang is near the Yangtze river, ~800 km south of Beijing and ~400 km west of Shanghai near the East China Sea coast. Early studies traced the TLFZ northward from Lujiang to the coast east of Beijing, ~300 km NNE of Tancheng. This ~650 km remains the best-documented. It crosses the suture of the Paleotethys ocean, which once separated the Sino-Korean (North China) and Yangtze (South China) plates. The >500 km offset of this suture and the neighbouring rocks was first reported by Ferdinand von Richtofen in 1898. It was explained by Xu in the early 1960s as an introduction of substantial left-lateral displacement on the TLFZ.

Because this first length of the TLFZ to be recognized crosses the Paleotethys suture, most of the literature regards it as having slipped during closure of this ocean and the associated continental collision during the "Indosinian" oregeny. Although several contributors to this book follow this hypothesis, others present contradictory evidence. This part of the Paleotethys ocean closed no later than Triassic time (~220–200 Ma). However, stratigraphic evidence (best presented in Chapter 7) demonstrates Early Cretaceous (~115–100 Ma) slip on the TLFZ. Several other chapters address the more likely possibility that the TLFZ took up motion between Eurasia and a plate within the Pacific basin. The NNE–NE structural trend of eastern China and neighbouring regions (Japan, Korea, and easternmost Russia) evidently resulted from slip on the TLFZ and other faults that are also subparallel to this ocean margin. It thus records part of the complex history of the Pacific basin, which is poorly understood during Mesozoic time.