Playing with fire

Stanley N. Williams

Monitoring Active Volcanoes: Strategies, Procedures and Techniques. By Bill McGuire, Christopher Kilburn and John Murray. *UCL Press: 1995. Pp. 421. £65, $99. Distributed in the United States by Taylor and Francis.*

MONITORING an active volcano is no mean feat. This is the first book to take on the formidable task of bringing together the strategies, procedures and techniques involved. It seems that the editors, with the help of 25 other authors, have had some success. I doubt whether my graduate students will need to buy the book for the advanced course in monitoring volcanoes that I plan to teach next year, but it should certainly be useful as a general reference.

There are 1,500 active volcanoes scattered around the world, and many useful and important things can be learnt from each of them. Those who really need a good textbook on methodology are in the developing countries, where some 500 million people are at risk from active volcanoes. Although there are many international leaders in monitoring active volcanoes, the contributors here are essentially all British, Italian and French; the lack of Japanese, Soviet, Icelandic and US authors, for example, means that the book has a rather limited perspective, focusing as it does mainly on Mount Etna (Sicily) and Piton de la Fournaise (Réunion). It is of course good that we can concentrate on dependably active volcanoes, but to do so at the expense of others misses many of the big differences in the goals of interesting basic research and the way in which active volcanoes are monitored worldwide. Seismology is the established and best method of monitoring volcanoes but the one chapter on that subject is very limited in its approach, ignores methodology and mentions nothing of the need for portable systems to deal with crises that crop up. The chapter on forecasting the behaviour of lava flows outlines an approach that in fact has little monitoring value, even though monitoring is the subject of the book.

John Murray and others do a great job of discussing how their approach to deformation can be made useful. Particularly enjoyable is the page devoted to vandalism and the authors' clever way of dealing with people and their bedevilment — a truly international problem. The chapter goes on to describe a suitably informative combination of methodology, instrumentation and results. Hazel Rymer contributes a similarly wonderful chapter on microgravity monitoring, showing how to get numbers from the field instruments.

The reality of monitoring active volcanoes is that we need many improvements in instrumentation and methodology. Despite the fact that the authors do not seriously address current problems and possible solutions, I am glad to have the book available, although it would be more valuable if the level of the chapters were not so unequal. Having said this, my recent time spent monitoring active volcanoes in Latin America, Indonesia and elsewhere may have made me difficult to please. □

Stanley N. Williams is in the Department of Geology, Arizona State University, Tempe, Arizona 85287-1404, USA.

Fossil fish

Keith Stewart Thomson

The Rise of Fishes: 500 Million Years of Evolution. By John A. Long. *Johns Hopkins University Press: 1995. Pp. 223. $49.95.*

IT is an odd fact that despite the great importance of fossil fishes, especially from the Palaeozoic and Early Mesozoic, in the development of both stratigraphy and evolutionary biology, very few books have been devoted to them. The first of course was Louis Agassiz's *Poissons Fossiles* (1833–44). After that, apart from more technical treatises, we have only had J. A. Moy-Thomas's superb little monograph *Palaeozoic Fishes* (1939), followed by Roger Miles's excellent revision and amplification (1971). Now comes Long's *tour de force*.

The Rise of Fishes is a mixture of text almost as detailed as the two versions of Moy-Thomas's book together with a great deal of background information and, above all, hundreds of superb photographs and drawings. One could almost take this for a coffee-table book at first glance, so profusely and well is it illustrated. Most of the photographs are by the author himself, who has been diligent beyond any reasonable expectation in studying at first hand the full range of materials about which he has written. Each group of fishes and almost all the important genera are discussed, with special emphasis on the newer taxa from the southern continents.

One great development in the past 30 years of fish evolution has been the explosion of discoveries from Australia, South America and Antarctica. The fishes of Gondwana reveal a range of diversity unknown elsewhere, including many early taxa arguably of crucial evolutionary significance. If Long allows himself a little Australo-centrism, the richness of antipodean material with which he and workers such as Alex Ritchie (Australian Museum) have dazzled us northerners justifies it. Added to discoveries in South America by John Maisey and others and the extraordinary finds in China and South-East Asia, they force us to rewrite our vertebrate histories, which have been centred on Europe, indeed on Agassiz's Old Red Sandstone, for far too long.

This book is not just a scientific and educational tool; it is also a visual celebration of the glories of biological diversity as seen in the fossil record. It will come as a surprise to many who have not realized how far the palaeontology of early vertebrates has progressed or experienced the depth of evolutionary information available from fossils. And, best of all, there is clearly more to come. □

Keith Stewart Thomson is at the Academy of Natural Sciences, Philadelphia, Pennsylvania 19103, USA.

From *The Rise of Fishes*

***Eastmanosteus*, a Late Devonian placoderm from east Gogo Station, Western Australia.**