

# ***The Geology of South Australia, Volume 1, The Precambrian, Bulletin 54 of Mines and Energy***

*Department of Geological Survey of South Australia, edited by J.F. Drexel, W.V. Preiss and A.J. Parker, State Print, South Australia, 1993, ISBN 0-7308-4146-4.*

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

Attached to this volume is a geological map of South Australia. The book is 242 pages long.

This is an indescribably beautiful book. In fact, I have seldom seen a book on geology that is so well put together. It is filled with impressive and well composed color photographs. None of these are unclear and all of them are sharply focused. They all show what they are intended to show.

In addition to photographs of outcrops, there are innumerable photomicrographs which are equally colorful and sharply focused. These photographs are supported by innumerable tastefully colored maps and diagrams. These include interpreted seismic lines, magnetic maps, and stratigraphic correlation charts. All are clear and easy to understand. The compilers of this book took hours and hours to put these illustrations together and ensure their high quality. The quality of these illustrations matches National Geographic Magazine, which probably represents the standard for the this type of illustrative text. The text and type is equally clear and easy to read.

This book summarizes the results of over the 150 years of geological investigation of the rocks of South Australia. Integrated into the text are studies of stratigraphy, sedimentology, igneous and metamorphic petrology, structural geology, tectonic seismology, geophysics, paleontology and paleocology. The book can be used in the search of minerals, energy, ground water resources, and in engineering projects and for finding and understanding of solutions for environmental problems including surface and climatic changes. What was equally pleasing to me was that the geologists writing this text opted to use sequence stratigraphic concepts to describe the sedimentary section and attempted to tie this to a chronostratigraphic framework.

The book begins with a chapter explaining the general geologic philosophy behind the compilation of this text and includes a description of sequence stratigraphic, tectonic, and structural nomenclature. The next chapter deals with geological framework of South Australia showing how it is related to an initial continent of Gondwana, describing its relationship to the tectonic features, magnetic intensity maps, and the variety of Precambrian organs and basins. It also shows the relationship of province to the overlying stratigraphy and provides a number of seismic lines to help explain these relationships.

In the chapters that follow the geology is described in terms of older rocks to younger. This begins with the Archaean section, which is composed largely of metamorphics and igneous rocks and is followed by a chapter on the Palaeoproterozoic rocks which are largely crystalline metasediments, metavolcanics and granitoids, all of which also have been variously metamorphosed and deformed. This is followed by a chapter on the rocks of Mesoproterozoic which include rocks that are anorogenic, the product of subaerial felsic and mafic volcanism, the result of the emplacement of mafic dyke swarms, felsic plutonism and continental sedimentation. The latter shows evidence of granulite-facies metamorphism and deformation.

Finally there is a chapter on Neoproterozoic which consists of sedimentary rocks deposited in cratonic, craton-margin and rifted-basin settings with relatively minor associated igneous activity. The best developed and complete sedimentary record of these rocks is exposed in the Flinders and Mount Lofty Ranges.

The text is an extremely complete compilation of Precambrian geology of South Australia. It is eminently readable, the illustrations incomparable, and undoubtedly this will be found on the shelves of most earth scientists working in South Australia. In fact any geologist planning to work in South Australia should probably own this book.