

BASIN AND RANGE EXTENSIONAL TECTONICS NEAR THE LATITUDE OF LAS VEGAS, NEVADA

Edited by **Brian P. Wernicke**, ISBN 0-8137-1176-2; Geological Society of America, Boulder, Colorado, 1991; Memoir 176, 511p

Review by Christopher G. Kendall

This volume is the direct result of symposium held by the Geological Society of America at Las Vegas in 1988 to report on a series of studies on the extensional tectonic features of the Basin and Range province close to Las Vegas. There are 23 papers in this volume and though they obviously vary in quality, style and content, reflecting the interests and experience of the authors, this is a professionally put together book which reflects well on the editorial capabilities of Wernicke and the dedication of the geologists whose papers are here. The book emphasises structural style and evolution of the region and most papers are on this topic, but there is an almost equal interest to the importance volcanism of the geological style of the area.

Papers range from a discussion of the effect of subduction of oceanic crust beneath North America; Miocene volcanism, folding and faulting; major extension in the basin and Range; shearing at Lake Mead; how sedimentology and stratigraphy can be used to constrain structural interpretations of the region; normal faults and thrusting; listric faulting and synorogenic sedimentation etc., etc.. The individual papers are not overlong, the illustrations are well reproduced and the references are timely. There is a mix of outcrop photographs, measured sections, beautiful block diagrams, cross-sections and restored sections. In a separate container there are a series of measured sections, geological maps and seismic lines, all reproduced clearly. The only shortcoming to these attached illustrations is that they were not coloured but this can be excused when it is recognised that even in these high tech days it costs money to make colour reproductions. Even so the Geological Society is rivalling AAPG with the quality of their latest books.

For those interested in extensional tectonics and particularly those of the Western United States this book is a nice buy, with a good feel to it. For the professional oil company geologist and geophysist there is enough hard science here to gain a good understanding of Basin and Range extensional tectonics. Here clearly laid out is the opportunity to track down the relationship with what is happening tectonically in the Basin and Range of the western USA and compare it with the Atlantic margin. Interesting material.

On an aside I particularly liked the dedication to the two golden oldies Troxel and Wright with the recognition of their fine field work and geological insight.

Finally, the last three papers of this book begin with the Taranaki basin, which is described by Palmer and Bult. This paper is a classic description of the basin stratigraphy and the relationship of oil and gas fields to basin stratigraphy. There are numerous cross sections, interpreted seismic lines, structural maps, even some SEM photographs of some of the lithologies associated with the McKee oil field.

Next is a professional paper by Schamel on the Middle and Upper Magdalena basins of Colombia has numerous cross sections, nice maps of the general structure of the basin, and its stratigraphy.

Finally, there is a paper by Bosi and Goddard on the Falcon Basin of Venezuela, where there are several small fields in the onshore and offshore areas of Venezuela. Again, this paper has maps, cross sections, seismic, and well logs, showing the evolution of the basin, and its relationship to the structural evolution of the area to the east of Lake Maracaibo. This report is

based on some 70 years of petroleum activity, numerous seismic lines, and over 1,000 wells. This memoir meets the usual AAPG standards. The papers are well written and well illustrated. The text really would be helpful to people working in active margins, and actually within the Los Angeles Basin, the Magdalena Basin, the Taranaki Basin, or the Falcon Basin. All are quite scholarly, and have numerous references. I'd say that the book is of greatest value to those who are playing the Los Angeles Basin, since the descriptions for this basin are the most complete. The papers for the Falcon, Upper Magdalena and the Taranaki basins are not as complete or as long, but are good starting points to track down the geological history of the basins, if one needs to go beyond the overview presented in this book. Unless you have a specific interest in active margin geology, this book probably better in your local library, but if you are actively exploring in the regions described by this book or exploring in active margin areas, then the text will be helpful to you. As is usual with the AAPG volumes, I am pleased to have this volume on my shelf. I enjoyed reviewing it.