

AAPG Memoir 65 entitled Salt Tectonics: A Global Perspective

edited by **P. A. Jackson, D. G. Roberts, and S. Snelson**, published by the American Association of Petroleum Geologists, ISBN 0-89181-344-6, 454 pages, 1995

Review by Christopher G. Kendall

This is another incredible book from AAPG representing a great epitaph to a declining oil industry, highlighting the tragedy that while this industry declines so our science is improving. Not only that but the quality of the publications of that describe this science is also improving, including the quality of the print, and the reproduction of maps and diagrams.

This exuberant book was assembled and edited by Martin Jackson, David Roberts, and Sig Snelson. It compiles the results of the Hedberg International Research Conference held in Bath, in United Kingdom where some 46 papers were presented and 36 posters were displayed.

The editors decided to choose 21 papers out of the 80 papers presented at the conference to highlight the key advances in salt tectonics since the publication of AAPG Memoir 8, edited by Braunstein and O'Brien in 1968. The overview chapters by Jackson enthusiastically describe the evolution of salt tectonics from the first description of the salt diapir, Ran El Melh, from the Safarian Atlas Mountains of Algeria, tracing the our understanding of salt diapirism from the effects of buoyancy versus orogeny to the discovery of salt glaciers and concepts of downbuilding and differential loading. Jackson recognizes the fluid era in which the effects of density contrast were expressed by the more dense overburden depressing the less dense fluid salt layer, leading to the discovery of peripheral sinks, internal structures and diapir families, the effect of salt acting as thermal convectors, the recognition of salt rollers and subtle traps, and flow law for damp salt, and mushroom diapirs. He discusses how, in about 1989, it was recognized that diapirs stop rising when a brittle roof becomes too thick. He also explain how rules for balancing sections were developed to include the effects of salt flats, rafts, reactive diapirism responding to tectonic differential loading, cryptic thin skinned extension, the influence of sedimentation rate on geometry of the past diapirs and extrusions, the effect of overburden thickness on active diapirs, fault segmented sheets, counter regional fault systems, subsiding diapirs, extensional turtle structures and anticlines and mock turtle structures. This paper sets the style for the rest of the volume which is subdivided into seven sections. In the first there are 4 chapters on balancing and modeling, with topics ranging from the geometric rules of section balancing for salt structures, evolution of salt-related structures in compressional settings, molding of salt diapirs by stiff overburden, and salt glacier and composite sediment-salt glacier models for the emplacement and early burial of allochthonous salt sheets. All these papers are illustrated by very fine line drawings, some seismic sections and some computerized topographic scanned images. These papers are followed by those which deal with regional distribution of salt and their origins. There are papers on the Gulf of Mexico, the North Sea, the South Atlantic Margin, the Red Sea, southern Spain and the Circum-Arctic (specifically dealing with the Arctic of Canada and the Barents Sea).

The intent of the book was to provide as complete a series of classic examples with a wide range of structural styles involving salt.

This book will be "the handbook" for salt tectonics for some time to come. It is a professional work, beautifully illustrated with a mixture of seismic lines, drawings and interpretations, and some wonderful computer graphics, many of which are in color. It really is a great book.

The editors and the authors have been able to create this comprehensive text because they had access to industrial data in the form of really excellent seismic lines plus the beautiful palenspastic reconstructions drawn by a number of the authors, making this book second to

none. Anybody involved with exploration in an area associated with salt will find this volume helpful to them. Graduate students involved in studying structure will find this text a must in the understanding of salt tectonics, while the general geological reader will also find it an extremely interesting book to dip into, examining diagrams and the illustrations, and just to read. I particularly recommend you to Jackson's introductive retrospection of salt tectonics but all the other papers are of extremely high quality. The illustrations add to make this a really great book and AAPG and the editors of this volume should be congratulated. The book does not cover all the salt basins of the world but has concentrated on regions where high quality geological data is available and has been interpreted on a sophisticated level. From a petroleum perspective it would be nice have something on the salt basins of Algeria, the Arabian Gulf, and the south Caspian area, but this is a minor quibble when one is confronted with the quality of the papers that were written. The intent of the authors and editors really was to provide an overview of the state of the art of salt tectonics rather than an atlas of salt basins. This latter might be a future objective for this group of salt tectonicists.