BOOK REVIEWS

LACOMBE, O., LAVÉ, J., ROURE, F. & VERGÉS, J. (eds) 2007. *Thrust Belts and Foreland Basins. From Fold Kinematics to Hydrocarbon Systems*. xxiii + 491 pp. Berlin, Heidelberg, Dordrecht: Springer-Verlag. Price Euros 149.95, SFr 246.00, US $199.00, £115.50 (hard covers). ISBN 9783 540 69425 0.
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Thrust belt research is on the increase, partly driven by a range of new modelling approaches and a well-connected community of active researchers. But in recent years a major motivation has been the increased exploration activity for oil and gas in thrust belts. In his recent review Cooper (2007) indicates that 14% of the World's discovered hydrocarbon reserves are in thrust and fold belts. This makes for an insatiable market place and there is no shortage of thrust belt publications, chiefly arising from a steady stream of conferences. Olivier Lacombe and his co-editors' volume *Thrust Belts and Foreland Basins* continues the trend. It arises from a three-day joint meeting of the geological societies of France and Spain, held in Paris in late 2005 that attracted over 120 participants from over 20 countries. So how is this new book different from the rest?

The 25 papers are grouped in seven topical sections, each briefly introduced by the editors. The first few sections deal with a diverse suite of analytical approaches: lithospheric-scale issues kick the volume off. Burov's review provides a good introduction to one large-scale tectonic modelling approach. There follows a couple of contributions on seismic imaging in thrust belts that show how seismic image quality in thrust belts can be greatly enhanced when geology is incorporated into velocity models. Of course this is well established, certainly in the major oil companies, but it is good to see these innovations making their way into the research community. Part three contains two papers on fluid migration in thrust belts that both stress the importance of resolving the timing of deformation, burial and uplift. These lead into a section on restoration and modelling. The two stand-out papers, both from the IFP group, serve as valuable 'how-to' reviews. Moretti *et al*. give a common-sense discussion of 3D structural restoration while Hardebol *et al*. present an interesting application of thrustpack modelling in the Rockies.

The remainder of the papers are essentially case studies but from historically under-studied settings. The majority here deal with the Zagros and Makran thrust and fold systems, a region that contains nearly half of the known hydrocarbon reserves that are hosted by convergent plate boundaries (Cooper, 2007). While the resource implications feature, many papers show the area's pre-eminence as a natural deformation laboratory through the combination of excellent satellite imagery, geodetic and seismological data. There are also papers on the Carpathians, a region of significant hydrocarbon potential but under-represented in the scientific literature. The final section deals with tectonostratigraphic issues, chiefly in the Apennines, that perhaps would sit more comfortably at the start of the book.

In summary, this book is a valuable addition to the literature on thrust belts. It is generally well illustrated and slick. The review style of some of the papers, together with a focus on examples that are of interest to the hydrocarbons industry, may add to its shelf life. It certainly a must for libraries. The collection is the first from a new 'task force' of the International Lithosphere Program, so expect to see other volumes dealing with other aspects of basin evolution in the coming years. The challenge facing these initiatives lies in integrating the vast amounts of high quality geophysical data and expertise that resides in the hydrocarbons industry with the research agendas of academia.

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Reference

COOPER, M. 2007. Structural style and hydrocarbon prospectivity in fold and thrust belts: a global review. In *Deformation of the Continental Crust: the Legacy of Mike Coward* (eds A.C. Ries, R.W.H. Butler & R.H. Graham), pp. 447–72. Geological Society of London, Special Publication no. 272.

STÜWE, K. 2007. *Geodynamics of the Lithosphere*, 2nd ed. xiv + 493 pp. Berlin, Heidelberg, Dordrecht: Springer-Verlag. Price Euros 89.95, SFr 147.50, US $119.00, £69.00 (hard covers). ISBN 9783 540 71236 7.
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This second edition of the book *Geodynamics of the Lithosphere* is a very welcome update to the original 2002 volume. The comments made about the first edition, which has been summed up precisely and well in the review of Jackson (*Geological Magazine* **140** (2), 2003, p. 231), still stand as a testament largely because, by its nature, this book is resistant to rapid outdating. For those who have not seen the earlier edition or Jackson's review, I will summarise the main content briefly here.

This book concerns thinking sensibly about the earth, not intending to provide an overview of how the earth works. It tackles a number of topics of interest to geologists and geophysicists, first by explaining the nature of the problem and then by showing how to apply basic principles of physics to analyse and understand the underlying process, attempting to capture the essence in mathematical form, leaving out the details which often keep us from seeing the wood from the trees. The range of topics is broad, covering plate tectonics, the earth's heat, kinematics and mechanics of the lithosphere (including, surprisingly at first, geomorphology), continental dynamics, and metamorphic processes. These are clearly the topics of interest to the author, as opposed to, say, seismology or phase transitions. This matters not, given that the purpose of the book seems to be in equipping the reader with the tools for thinking about problems and their solution rather than global topic coverage. The book is aimed at those who are new to numerate thinking, and does the job very well without either dumbing down the subject or looking down on the uninitiated. The mathematics are well introduced and explained, and a useful pair of appendices helps those who need to get up to scratch with some of the concepts.

A question that arises naturally is whether the second edition is significantly different from the first. Superficially, yes – there is new material and some is based on new findings