

Peri-Tethys memoir 4. Epicratonic basins of Peri-Tethyan platforms

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REVIEWS¹

Peri-Tethys memoir 4. Epicratonic basins of Peri-Tethyan platforms

Edited by Sylvie Crasquin-Soleau
and Eric Barrier

*Mémoires du Muséum National d'Histoire
Naturelle, Tome 179*

Paris, France

1998, 294 p., 300 FF (approx. C\$61)

English with French abstracts

Reviewed by Benoit Beauchamp

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This volume is the fourth installment in a series of *Mémoires* of the Muséum National d'Histoire Naturelle to be published on the Peri-Tethys Program, an industry-sponsored European program aimed at examining the influence of Tethyan evolution on the bordering cratons from its birth (break-up of Pangea), through its life (extension and formation of oceanic seaways) and to its death (collision and inversion). I recently reviewed volume 3 of the same series (*Geoscience Canada*, 1998, v. 25, p. 194-195), which I thought was little more than a mishmash of all kinds of papers dealing with just about everything under the sun, saved somewhat by a few good papers on the structural and kinematic evolution of the Peri-Tethyan platforms. To my pleasant surprise, volume 4 is a far

better installment.

Like the preceding volume, this *Mémoire* is subdivided into two groups of five multi-authored papers devoted to the two broad geographic domains involved in the program, the Northern and the Southern platforms. The first five papers on the Northern Platform constitute very informative, scientifically sound contributions dealing with various areas of Eastern Europe. Two of these papers are regional litho- and biostratigraphic studies, one on the Upper Jurassic of the Volga Basin by Hantzpergue and four co-authors, the other one on the Mesozoic of the Mangyshlak of West Kazakhstan by Gaetani and twelve co-authors. One paper, somewhat more than the others, deals with Mid-Cretaceous events in eastern Europe and is co-authored by Baraboshkin and two other authors. The paper by Lamarche and seven co-authors is an excellent structural analysis of the development and deformation of a Mesozoic Basin adjacent to the Teisseyre-Tornquist Zone in the Holy Cross Mountains of Poland. The fifth paper in that first group, authored by Ershov and five co-authors, combines basin analysis and flexural modelling to decipher the origin and evolution of the foreland basin adjacent to the Caucasus during the Cenozoic collision.

Of the second group of five papers on the Southern platform, the remarkable contribution by Elmi and nine co-authors stands out as the best paper of the entire volume. This 66-page paper is a remarkably well-illustrated and superbly docu-

mented stratigraphic and paleogeographic study of the Lower and Middle Jurassic along a north-south transect in western Algeria. It comprises a large number of colour diagrams, maps, stratigraphic sections and breathtaking colour photographs of outcrop features in addition to fossil illustrations. A contribution by Martire and two co-authors is a solid stratigraphic analysis of the Upper Jurassic of Northern Ethiopia. The paper by Hirsch and eight co-authors on the Jurassic of the southern Levant (Egypt, Israel, Jordan, Syria) reconstructs the paleogeographic history of the studied area based largely on the study of various fossil groups. Poisson and four co-authors provide an interesting basin analysis of the Jurassic of the central High-Atlas (Morocco) whereby they discuss the origin of the subsidence patterns. Finally the paper by Broutin and six co-authors departs somehow from the others in that it is the only one that deals with the Paleozoic record. It documents some Permian basins of central Morocco, this one combining litho- and biostratigraphy with the analysis of terrestrial macrofloras.

Memoir 4 of the Peri-Thethyan Platform is a far better, more concise product than the previous installment. The 10 papers are all very informative, multidisciplinary studies more or less of the same weight in terms of quality of the presentation and breadth of the studies. One paper (Elmi, *et al.*) stands out above the others but this takes nothing away from the others. The whole volume reads

¹ Ashton Embry reviewed the newly available CD-ROM version of Sir John Franklin's 1819-1822 Arctic expedition in *Geoscience Canada*, 2000, v. 27, n. 1, p. 45. This CD-ROM is the first of five similar antiquarian volumes now available in the same CD-ROM format, published by CD-Academia Book Company (infocd@cd-books.com). All of these volumes contain highly significant early observations on Canada's 19th century Arctic peoples, terrain, and geology. Additional CD-ROM electronic books in the series are: *Narrative of a Second Expedition to the Shores of the Polar Sea, 1825, 26 and 27* by John Franklin, 1828; *Narrative of the Arctic Land Expedition to the Mouth of the Great Fish River, 1833, 1834, 1835* by George Back, 1836; *Narrative of an Expedition in HMS Terror...On the Arctic Shores, 1836-37* by George Back, 1838; and *The Private Journal of Captain G.F. Lyon of the H.M.S. Hecla, 1825*. Soon to be available is *Narrative of a Second Voyage in Search of a North-West Passage and of a Residence in the Arctic Regions, 1829-33* by John Ross, 1835. The prices of these CD-ROMs for institutional or personal use can be obtained using the above e-mail address. Editor.

like a compendium of well thought-out research projects. This time, and as opposed to the previous volume in the series, I would give this one a "strong buy" recommendation for anyone interested in the regional geology of the Mesozoic platforms that surround the Tethys. Those who don't have a direct interest in the area should still look for the book in the library if only to satisfy their curiosity about this interesting and complex area.

Roadside Geology of Maine

By D.W. Caldwell
Mountain Press Publishing Co.
Missoula, Montana
1998, 318 p., US\$18.00 paperback

Roadside Geology of Indiana

By Mark J. Camp and
Graham J. Richardson
Mountain Press Publishing Co.
Missoula, Montana
1999, 316 p., US\$18.00 paperback

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All geologists who can tear themselves away from computer screens and geophysical logs to look at actual rocks — and, alas, I fear we are a dwindling number! — have cause to be grateful to Mountain Press for the two excellent series of guidebooks to geology at outcrop. The two latest in their Roadside Geology series are both well up to the high standard set by earlier volumes.

D.W. Caldwell grew up in Maine and worked awhile with the Maine Geological Survey, as well as with the United States Geological Survey. He is nowadays a consultant in the fields of construction and hydrology, while also serving on the faculty of Boston University, Massachusetts. His account, of a state whose earlier topography was virtually obliterated by the Wisconsin glaciation,

necessarily stresses the erosional and depositional effects of the episode in earth history. However, as he shows, there is plenty to be seen in roadsides that will excite the structural and metamorphic geologist, and a sufficiency of interest also for the igneous geologist and mineralogist. Only the paleontologist is likely to be disappointed.

Paleontologists and soft-rock stratigraphers should have a happier time in Indiana, where the strata laid down on the flanks of the Kankakee and Cincinnati arches of the Middle to Late Paleozoic are rich in invertebrate fossils. Here also, the landscape was shaped in the Pleistocene; glacial deposits blanket much of the northern part of the state, with windborne sands forming an extensive dune complex, and loess providing the fertile soils that are Indiana's richest natural resource. However, the earlier strata have added economic materials to the state's income, and the geological itineraries include coal mines (functioning or abandoned), clay and marl pits, limestone and ironstone quarries, and monuments to the search for petroleum. The authors — a stratigrapher and a glacial geologist, respectively — are well qualified to expound Indiana's geology and do so in lively fashion.

Both books feature clearly drawn and informative maps and sections, most often in two colours, along with a plethora of photographs, historic or modern. (The second book also includes effective sketches of the biological communities of past times.) The little red roadbadges at the top corners of pages attractively facilitate their consultation. Both books, like their predecessors in this excellent and innovative series, can be recommended without reservation to geologists visiting these states, and the prices are remarkably moderate, an important factor in this age of wallet-emptying book prices!

Principles of seismology

By Augustin Udias
Cambridge University Press
Cambridge, UK CB2 2RU
2000, 475 p.
US\$39.95 paperback, US\$90 hardcover

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The topics covered in *Principles of Seismology* by Udias are also covered in a combination of other seismology books including those authored by Aki and Richards, Bullen and Pilant. However, this book has its own unique blend of seismic theory and observations. It should prove to be a very useful publication for seismologists at a wide range of expertise levels.

Several chapters cover the fundamental seismic theory of elasticity and wave propagation. Basic concepts and characteristics of elastic solids, such as Poisson's ratio, are well explained. The book also discusses more esoteric topics such as the effects of gravity and temperature on seismic wave propagation.

Normal mode theory, reflections, refractions, surface waves, and ray tracing are all lucidly explained. Many of the concepts are relevant for global, engineering and exploration seismology. It is interesting that finite-difference and finite-element solutions to the wave equation are not discussed, even though they are used in engineering and exploration applications. This is probably due to the fact that these methods are prohibitively expensive for most global seismology problems and this book tends to emphasize global seismology.

Principles of Seismology has much to offer those studying natural earthquakes since it contains a number of famous earthquake seismogram examples. There are complete discussions of earthquake sources, magnitudes, fracture models, and methods for locating earthquake epicenters. Useful geometrical and physical explanations are given for earthquake source mechanisms and resulting fractures. The discussions of seismometers and earthquake recordings were relegated to the last chapter, which is