

## Roadside Geology of Maine; Roadside Geology of Indiana

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Volume 27, numéro 3, september 2000

URI : [https://id.erudit.org/iderudit/geocan27\\_3br02](https://id.erudit.org/iderudit/geocan27_3br02)

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### Éditeur(s)

The Geological Association of Canada

### ISSN

0315-0941 (imprimé)

1911-4850 (numérique)

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### Citer ce compte rendu

Sarjeant, W. A. S. (2000). Compte rendu de [Roadside Geology of Maine; Roadside Geology of Indiana]. *Geoscience Canada*, 27(3), 148–148.

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 states, 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, surfaces 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