

**Wandering Continents and Spreading Sea Floors on an Expanding Earth**, by Lester C. King, 1983, Chichester, NY: John Wiley & Sons, 232p. ISBN 0-471-90156-3 (hardcover).

Written by a distinguished geomorphologist, this is an excellent introduction to plate tectonics and sea floor spreading. His earth expansion hypothesis is controversial but only a secondary question. Of particular value is his dynamic-historic explanation of coast types, coastal plains and continental shelves.

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**Sea-Level Research: A Manual for the Collection and Evaluation of Data**, edited by Orson van de Plassche, 1986, Geo Books, Norwich, UK, 618p. £49.50, ISBN 0-86094-187-6.

Almost, but not quite, this is an excellent compilation. It is designed as a manual both for aspiring students of world sea-levels, and for old hands to refer to in times of crisis. The volume comprises 22 chapters, all but two of which focus on the value of sea-level phenomena as precise indicators of marine water level history. Such precision can be resolved into two components: how good and unambiguous are sea-level indicators in providing vertical control; and two, how sensitive are such indicators to time. Obviously, any indicator that develops quickly at a definable level relative to sea-surface is of immense value. One that evolves slowly, perhaps over several periods, across a wide vertical range is not. Faced with these dilemmas, the sea-level researcher must make a number of crucial decisions, based both on the material available, the resolution of signals (especially against all-too-noisy backgrounds), and the objectives of the study. Almost inevitably one is going to take a sub-optimal course, so that any resulting record of sea level will, axiomatically, by "fuzzy." The search for better and better resolution may lead us into a confusion between accuracy and precision. Many sea-level researchers are going to great lengths to measure precisely, seemingly ignoring the inherent accuracies in the natural environment. Most sea-level curves are only as good as their least-reliable control, such as sediment compaction,  $^{14}\text{C}$  contamination, neotectonic movement and so forth. These ideas must be borne in mind when reading a

book like *Sea-Level Research*.

The two opening chapters, by Orson van de Plassche and Clarence Kidson, provide a "double-act" introduction. Plassche is concerned with the role of sea-level research, especially in coastal management, and the framework within which we should strive to work. Kidson's essay, reprinted from *Quaternary Science Reviews* (volume 1, 1982), paints on a broad, if somewhat personal, canvas, a picture of the constraints of sea-level studies. Kidson's contribution reinforces the view that obtaining a "true" record of sea level even for a small area is tantamount to seeking the Holy Grail. But read on...

The remainder of the book is thematic, divided into 16 chapters on specific sea-level indicators—marine molluscs, corals, sediments, notches, submerged forests, *etc.*, plus two chapters on "age," and two on "altitude." The indicator chapters are a real mixed bag. Some authors, for example Andrews on "raised beaches" and Martin, Suguio and Flexor on "shell middens" adopt a very regional approach and leave the reader to interpret and draw the parallels with his or her own research topic. The geomorphology topics, while not so parochial, are rather restricted, from example Roep concentrates on the Dutch barriers, themselves somewhat anomalous for showing offlap tendencies during rising sea level. The beachrock chapter (by Hopley) and the marine notches chapter (by Pirazzoli) are interesting, but beg many of the questions about timing that must arise with development of such features. Quite why these two landforms were covered, and not rock platforms, strandflats, coastal dunes and beaches is not clear; all these environments include preservable morphology and sediments, useful for unravelling sea-level changes. The biological indicators are perhaps more convincing, although here ooids and coralline algae score poorly, but molluscs, vermetids, plant remains, forams, ostracods and diatoms all have their adherents, and have by-and-large put sea-level research where it stands today.

The concluding chapters are in some ways the best, perhaps because they deal with more technical, and therefore precise, facets of the subject. Chapter 19 on Radiocarbon Dating by Mook and van de Plassche is excellent, and includes the most digestible summary of "apparent ages" I have read. It is a pity that other isotopes, especially  $^{210}\text{Pb}$ , are not covered.

At the start I said the book was "almost" excellent. I feel I must justify my comment by highlight-