



## BOOK REVIEWS

**Marine Terrassen und Korallenriffe—das Problem der quartären Meeresspiegelschwankungen erläutert an Fallstudien aus Chile, Argentinien und Barbados.** Ulrich Radtke, 1989. Düsseldorf Geographische Schriften, Universität Düsseldorf, 246p., 132 figs., 30 photographs. ISSN 0935-9206.

The chronology of Pleistocene interglacial shorelines has always given trouble. The Mediterranean, as their classical type area, is unfortunately prone to considerable neotectonic disturbance. The generalized curve based upon a "numbers game" with correlation to the Milankovitch astronomic model by ZEUNER (1945) and reproduced in FAIRBRIDGE (1961) is unquestionably wrong, but a reasonable, updated model such as developed in Barbados is based upon a uniform uplift assumption and cannot be confirmed according to a new report by Radtke, whose university "habilitation" thesis is now reviewed. The original, in German, carries long summaries in English and French, and is supported by a very large number of MS-Th/U and ESR dates.

Field work was done mainly on the two sides of South America, a Chilean section, reflecting a slowly rising subduction coast, and an Argentinian profile associated with a fairly stable (up and down) passive plate margin. Mollusks provided the dating material and with new techniques they seem to be supplying a consistent pattern, at least for the last interglacial (c. 125,000 BP). The new methodologies offer the potential of eventually pushing interglacial shoreline dates back to about 500,000 BP.

Samples were also collected in tropical Barbados where corals are available; these generally provide the best dating materials. A would-be "standard" late Pleistocene eustatic curve developed for Barbados is regarded by Radtke with reservations because it assumed a smooth, uniform uplift rate, whereas there is good evidence of interruptions. At least a non-uniform hydroisostatic correction would be needed from time to time. Sometime in the future, and following con-

siderably more research, Radtke believes that an El Dorado of eustatic workers will be approached, an approximation of a standard curve, but he doubts if any one site will provide it. Tectonism and geoid adjustment, even infrequent and episodic, should never be discounted.

For readers of the German language this publication furnishes long and well-referenced reviews of the fundamental and classic questions of Pleistocene eustasy, together with the complex questions of absolute dating. Some of the techniques, incidentally, are surprisingly simple, and need not be relegated to the high-cost commercial laboratories. Low-cost  $^{14}\text{C}$  assays, of somewhat imprecise quality but nevertheless invaluable for general guidance, can also be employed now by the field scientist.

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**Physische Geographie der Meere und Küsten.** D. Kelletat, 1989. Teubner Studienbücher der Geographie, B. G. Teubner, Stuttgart, 212p., 106 figs., ISBN 3-519-03426-3.

Not many (non-German) readers of JCR will be able to read Kelletat's pocket-book-sized volume on the "Physical Geography of Seas and Coasts," which is a pity because it synthesizes in a most accessible way the large number of topics and wide-ranging geographic variety of coastal landforms and dynamic processes. Out of 640 references (mainly English, German and French) quite 80% deal with coastal questions. He also provides numerous tables of useful data, and 106 (line) illustrations, which include a large number of world maps, ranging from wave types to zonality (the geomorphic expression of differing climatic zones). The latter is one of the author's pet hobbies, but he does not give it unjustifiable weight.

The volume can be warmly recommended as a source of fair, well-balanced summaries of the principal physical features and dynamic processes of oceans and shorelines. Controversial questions are still abundant, such as the eustatic/tectonic relations of former coasts, as are just plain gaps in our knowledge which leave white spaces on many distribution maps. The author does not try to gloss over the imperfections, but leaves rather the impression of the wonderful variety and endless challenges that remain.

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**Sea Levels, Land Levels, and Tide Gauges.** K. O. Emery and D. G. Aubrey, 1991. Springer-Verlag, New York, Berlin, *etc.*, 237p., 113 figs. ISBN 0-387-97449-0 (NY); 3-540-97449-0 (Berlin).

This is a remarkable volume that will find a welcome place on the desk of almost every coastal scientist. It is a comprehensive review and analysis of the world's tide-gauge data. Ideally we would like to use long runs of measurements (like Amsterdam, which started in 1682), but unfortunately only five records exist in the over-100 yr class. Some 65% of the 664 tide stations examined have records of <30 yr, which is not long enough

to span major climatic fluctuations. In the end the authors decided to analyze 98 records that were adequately long and complete. Even then a serious bias exists; only two are from the southern hemisphere and none are from high latitudes. Furthermore, outside of the glacio-isostatic uplift areas, most of the stations are sited on subsiding coasts; thus a strong bias suggests local sea-level rise. The authors carefully review all the different processes that may affect the values.

In their Figures 96 and 97, graphic representations show the patterns for those 98 records with regression means indicating rising or falling relative sea level around the world. The geological reader will notice immediately that most of the rising coasts are in the glacio-isostatic regions of Scandinavia and Canada. Plate margin tectonics account for the others. The most stable coastal sectors are *all* along the mature, passive plate margins, specifically those part of the former megacontinent of Gondwanaland.

The volume is replete with helpful tables and interesting figures. It has over 800 references, half of them published since 1979. The work is "user-friendly" to the point of having extensive summaries in no less than eight languages. The authors evidently hope it will be useful world-wide. I'm sure they are right.

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