

Stratigraphie Traps in Sandstones - Exploration Techniques

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review relevant aspects of physical oceanography. Other papers report the results of extensive field investigations which determined not only the sediment distribution but also the dynamics of the water masses: examples are studies by Smith and Hopkins, and by Sternberg and McManus (both concerned with the shelf off the State of Washington), the paper by Ludwick on tidal sand waves, and the paper on the entrances of Georgia estuaries by Oertel and Howard.

A few papers try to develop general models: they include the stochastic model for sediment sorting derived by Swift, Ludwick and Boehmer, a general model for the distribution of fine grain sediments discussed by McCave, and a general paper on the evolution of the Holocene shelf surface on the U.S. Atlantic coast, by Swift, Kofoed, Saulsbury and Sears.

This is a big book, and it is not possible to mention all the interesting things to be found in it. It does not pretend to give all the answers, even for the few shelves that get most of the attention. But it does show a new approach to studies of shallow marine clastic sediments, and it gives an interesting preview of the results that are likely to be achieved in the future.

MS received September 17, 1974.

Stratigraphic Traps in Sandstones - Exploration Techniques

by Daniel A. Busch
American Association of Petroleum Geologists, Memoir 21, 174 p. 1974.
 AAPG and SEPM Members \$12.00;
 Others \$15.00.

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According to the author, this book "should be of particular benefit to explorationists who work for small companies or independents, and to geological consultants not in a position to pursue research actively". Unfortunately, the book is both conceptually and factually between 12 and 20 years out of date. The last 10 years of intensive research in recent sediments, and sedimentology and stratigraphy of ancient rocks, are mostly ignored, and hence the basis for the stratigraphic traps is very dated. Analysis of the references shows that the modal five-year period of citations is 1955-59 (63 references), with a steady decrease (47, 39, 24) in the following five-year periods.

Chapters 1, 2 and 3 (30 p.) cover terrigenous deposition in marginal-marine areas, and fundamental concepts related thereto. This part of the book is based upon ideas and diagrams from Grabau (1913), and emphasizes concepts of cyclic subsidence and cyclic uplift. Busch's own ideas of Genetic Increments of Strata (GIS) and Genetic Sequences of Strata (GSS) are introduced, but are unrelated to process except to state that one GIS is "an interval of strata representing one cycle of sedimentation". The types of "cycle" are not specified.

Chapters 4 and 5 (40 p.) cover recent and ancient beach, barrier bar and offshore bar sands. The chapter on recent sands does not mention the fundamental concept of barrier bar origin from subsiding beach ridges (Hoyt, 1968), nor does it discuss the fundamental gradational-based, coarsening-upward sequence that results from barrier bar progradation.

Our understanding of beaches and barriers has changed so much in the last 10 years that these two chapters are of little use. The recent and ancient examples that Busch cites are not integrated into an exploration model - they remain as disconnected examples.

Chapter 6 (35 p.) is devoted to recent and ancient channel sandstones, and does attempt to generalize on exploration techniques. However, the basis of the models is still very out-of-date, with the most recent introductory references for basic information dating from 1963.

Chapter 7 (36 p.) is on deltas. The classification is morphological (Arcuate, Estuarine, Birdfoot, Lobate, Arcuate, Cuspate), and does not mention the more conceptually useful ideas of High-Constructive and High-Destructive deltas. Although citing Scruton (1960), Busch does not mention constructive and destructive elements, nor detrital lenses alternating with bounding layers, nor the idea of coarsening-upward sequences. In the five pages at the end of the chapter on delta prospecting, Busch is basing his exploration models on ideas of cyclic subsidence, and does not consider local delta switching (as in the last 5000 years of Mississippi Delta construction) as a useful exploration possibility.

The book ends here, without even mentioning deep water sands, turbidites and hydrocarbon accumulations in the Los Angeles and Ventura Basins. It can only be recommended to those who wish to base their exploration techniques on ideas current in the late 1950s.

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