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Colin P. North and Kitty L. Milliken, Editors
A.J. (Tom) van Loon, Associate Editor for Book Reviews
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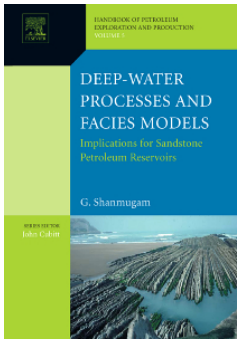
Deep-Water Processes and Facies Models: Implications for Sandstone Petroleum Reservoirs (Handbook of Petroleum Exploration and Production, vol. 5), by G. Shanmugam, 2006. Elsevier B.V., Customer Service Department, Linacre House, Jordan Hill, Oxford OX2 8DP, UK (Europe, Middle East and Africa). Elsevier, Customer Service Department, 11830 Westline Industrial Drive, St. Louis, MO 63146, U.S.A. (U.S.A. and Canada) . Hardcover, 476 pages. Price USD 135.00; GBP 85.000; EUR 120.00. ISBN 0-444-52161-5.



The world's oceans remain a frontier for marine geologists and sedimentologists and for human exploration. They also represent a challenge for petroleum geologists and resource exploitation in the near future. Deep-sea sediments are mostly unknown despite requiring only collection, observation, description and measurement. The physical processes at their origin are even less understood, because the physics and hydrodynamics are poorly known. This situation has resulted in considerable semantic barriers between geologists and physicists.

In this sense, writing a book on deep-water processes and facies models is a challenge. Shanmugam has taken it up, and written a book that mixes parts with both classical and non-classical form.

The non-classical part is represented by the introduction of the book, which includes chapters on the history of deep-water sediment research including "philosophical" concepts. This part of science is rarely included in a scientific or technical handbook. It shows that a scientific domain is a slow construction over time, and reminds scientists that references older than ten or twenty years are as important as more recent papers and must be cited without shame. Unfortunately, the form is frustrating. Shanmugam provides only a list of items without discussion along the way to show how the elementary pieces of science pile up or have been progressively replaced.

The classical part includes essential chapters on the different kinds of submarine processes: gravity-driven, deep-water bottom currents, other processes and the phenomenon of tsunamis (including "liquidization" and injection). These five chapters form a good overview of the processes for undergraduate students although the relative attention paid to particular processes is sometimes curious. Shanmugam surfs on the tsunami wave, and considerable importance (15 pages) is given to this process which is not of primary importance in deep-sea environments. Conversely, ice rafting, nepheloid layers and volcanism are described in only two pages, and only two additional pages are dedicated to pelagites and hemipelagites despite the serious problems that these deposits pose for oil exploration because they usually form permeability barriers.

Chapter 6 is a transitional chapter on depositional environments. These environments are described in a non-academic manner by presentation of real case studies, using Shanmugam's wide experience of field geology.

Chapters 7 to12 are more specialized chapters on process-related problems, including turbidite facies models, submarine fan models, sequence-stratigraphic fan models, controls and implications for sandstone petroleum reservoirs. These chapters are dedicated to graduate students, petroleum geologists or academic scientists.

Throughout the book, Shanmugam discusses scientific and semantic problems. Although it is evident that discussion is necessary in sciences and that scientific doubt must be taught to students, it is also evident that at some point conclusions must be presented, even though new questions will continue to appear. That is the objective of a handbook: to provide some answers to scientific problems whatever the level of confidence and the size of the problems at hand. However, Shanmugam's fascination with polemics always gets the upper hand and sometimes leads to a summary execution of scientific authors and ideas in a purely journalistic style. As a consequence, reading the book generates the false impression that everything is wrong, except a few concepts (including the Bouma sequence) and what Shanmugam has done himself.

Despite these criticisms, the book is well and considerably illustrated (more than 280 pictures) and includes a large reference list (more than 900 references including 55 self-citations). Most of the figures have been already published by Shanmugam and colleagues in scientific papers. A substantial number of figures including seismic lines, core pictures or swath bathymetry are in colour.

Thierry Mulder
Université Bordeaux 1
Département de Géologie et Océanographie
UMR EPOC 5805
Avenue des Facultés, 33405 Talence Cedex
FRANCE

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