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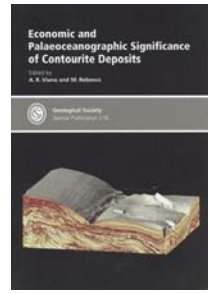

Economic and Palaeoceanographic Significance of Contourite Deposits, edited by A.R. Viana & M. Rebesco, 2007. Geological Society (London) Special Publication 276. The Geological Society of London, The Geological Society Publishing House, Unit 7, Brassmill Enterprise Centre, Brassmill Lane, Bath, BA1 3JN, United Kingdom. Distributors in North America (1) The Geological Society, c/o AIDC, 82 Winter Sports Lane, Williston, VT 05495, USA, and (2) AAPG Bookstore, PO Box 979, Tulsa, OK 74101-0979, USA. Hardcover, 350 pages. Price GBP 85.00; USD 170.00 (fellow price GBP 42.50; corporate affiliates price GBP 68.00; other societies' price GBP 51.00). ISBN 978-1-86239-226-7.

This thematic volume on contourites, composed of 16 papers (Table 1), is an outgrowth of a symposium that was held during the 32nd International Geological Congress in Florence (Italy) in 2004. The strength of this volume is the impressive sets of diverse data, with emphasis on seismic, covering modern and ancient oceanographic settings (Table 1). The volume offers some useful findings. They are (1) the potential dangers of misinterpreting regional unconformities at the base of contourites as sequence boundaries on seismic profiles (Viana et al.), (2) the similarity in seismic geometry between turbidite channel-levee systems and contourite drifts (Rebesco et al.), and (3) the disconnect between seismic geometry and the ground truth (core). Verdicchio et al., for example, present a seismic profile (their fig. 3) with external mounded geometry typical of contourite drifts, but a core (their fig. 10) taken from this seismic mound is composed of pure mud without any traction structures. The implication here is that the routine interpretation of contourites based on seismic geometries is tenuous.

The volume's title, with emphasis on economic significance, is misleading. This is because only one paper (Akhmetzhanov et al.) discusses the economic aspects with relevant and transparent data. Although both Viana et al. and Moraes et al. address economic aspects, they do not contain transparent and verifiable data (see details below).

Because the editors did neither define the term "contourite" nor did explain the types of bottom-current deposits right up front in the volume, there is no clarity on the very fundamentals of the topic under discussion. This ambiguity has led Moraes et al. (p. 92) to state that "The origin of the bottom currents that formed the contourite sequences is not clear. As such currents developed within canyons and troughs, deep tidal currents or deviated geostrophic currents seem to be the most probable." In other words, the authors have a mindset to classify the sediment as contourite without any objective criteria for deposition from contour-following thermohaline bottom currents. This nomenclatural problem has been further compounded by Rebesco et al., who have widened the meaning of the term "contourite" to include tidalites by citing a publication of mine incorrectly.The dogmatic use of the contourite-facies model (Hüneke) and bioturbation (Moraes et al.) as the evidence for contour currents, without considering alternative processes, is prevalent. Bioturbation, common in turbidites and tidalites, is not unique to contourites. Viana et al. propose a longitudinal model for coarse-grained contourite systems (their fig. 12). Strangely, this contourite model is analogous to the "turbidite fan model" of the 1960s. The contourite model is composed of a proximal fan, a middle fan, and a distal fan. The problem is that the authors did not disclose the geographic locations, well names, depths, and ages of 10 cores that were used from the SE Brazil margin to substantiate the distribution of facies in the model. The authors did not explain either under what hydrodynamic conditions the structureless sand blankets (showing "horizontal bedding"), which occur in between dunes (upper flow regime) and current ripples (lower flow regime), would develop. It is unclear as to why bioturbation would be abundant in proximal areas of the model, where the current intensity is at its maximum. Finally, there is no explanation as to how and why contour-following traction currents would develop fan-shaped sediment bodies.

The volume undoubtedly suffers from mediocre peer reviews and uncritical editorial policies on fundamental scientific issues. For example, (1) there is no hydrodynamic explanation for "lateral accretion" deposits (fig. 8 of Akhmetzhanov et al.). Did these lateral accretion deposits develop under hydraulic conditions that are similar to the origin of fluvial point bar (i.e., lateral accretion) deposits by helical flows at inner bends of sinuous channels? (2) There is no hydrodynamic explanation for "HARP" deposits (fig. 10b in Viana et al.). Are they analogous to the origin of "HARP" turbidites that form due to channel bifurcation through avulsion? (3) There is no hydrodynamic explanation for the upward change from Ta to Tb in a "turbidite sequence" (fig. 5 in Moraes et al). How did a suspension turbidity current (Ta) transform into an upper flow regime traction current (Tb)? (4) There is no hydrodynamic explanation for the behavior of "geostrophic" bottom currents (Akhmetzhanov et al.). (5) There is no discussion on the hydrodynamic behavior of granular material in explaining the origin of various (mostly seismic-scale) features, such as bedforms (Llave et al.; Verdicchio et al.), sand dunes (Viana et al.), barchan dunes (Verdicchio et al.), and sand waves (Llave et al.). (6) There is no hydrodynamic explanation for the origin of "muddy sand waves" that are claimed to be emplaced by contour (traction) currents as well as by turbidity (suspension) currents (Viana et al.). How these two hydrodynamically different currents develop identical sand waves? (7) There is no explanation or evidence for "bedload transport pathways" (fig. 5 in Akhmetzhanov et al.). (8) There are no discussions of objective criteria for correlating intervals of bottom-current deposits using wireline logs (fig. 8 in Georgiev & Botoucharov). For example, what are the criteria for distinguishing cm_thick contourites from tidalites or from turbidites on wireline logs?

Perhaps the most obvious shortcoming is the direct comparison of seismic geometries of modern contourite drifts deposited in bathyal water depths (2000-5000 m) in the Indian Ocean and the Atlantic Ocean with those of fossil (Cretaceous chalk) contourites deposited in shallower (700-800 m) epeiric seas of the Danish Basin (Esmerode et al.), without justification. What is the role of compaction of chalk with age on seismic geometries? Similar concerns were expressed by Georgiev and Botoucharov.

The volume contains numerous editorial and formatting flaws. Examples are (1) the excessive use of acronyms (Llave et al.; Verdicchio et al.); (2) the marked absence of necessary descriptive details of sedimentary structures in captions of core photographs (Papers Viana et al.; Moraes et al.; Verdicchio et al.; Georgiev and Botoucharov); (3) the obvious absence of location maps for seismic lines, seismic maps, structural maps, wireline logs, and temperature and velocity sections (Viana et al.); (4) the absence of required scales for certain sea-floor images and seismic lines (Viana et al.); (5) the disorderly arrangement of figures: 1, 2, 3, 4, 5, 6, 7, 9, 8, 12, 10, and 11 (Viana et al.); (6) illegible text on figures due to extreme size reduction (Viana et al.); (7) incorrect citation of reference: Viana 2007 should read Viana et al. 2007 (Georgiev and Botoucharov, p. 287); (8) awkward use of the term "condensation" for hiatus (Hüneke); (9) inconsistent use of verb for a singular noun: "Petrobras are thanked" (p. ix) and "Petrobras is thanked" (back cover); and (10) inappropriate use of printed space for the logo of an oil company, which occupies 1/3 of a page (p. ix), for redundant acknowledgement purpose.

The volume contains 69 color figures that include some impressive seismic block diagrams (p. 190). The contribution by Akhmetzhanov et al., which is perhaps the most relevant to the economic theme of the volume, contains no color figures, whereas the contribution by Lima et al., which is the least relevant to the theme, contains the highest number (16) of 16 figures (Table 1). In all, five contributions (Akhmetzhanov et al.; Lucchi & Rebesco; Robinson et al.; Verdicchio et al; Hüneke) do not contain any color figure. Four contributions (Viana et al.; Moraes et al.; Duarte & Viana; Lima et al.), the principal authors of which are affiliated with the oil company that funded the printing cost, contain 40 color figures (58%).

The contourite community has taken a complacent path in publishing this volume. Along the way, they have managed to bungle up the meaning of the simple term "contourite".

Table 1. Details of the 16 contributions.

authors	region (age)	data sets*	total number of figures	color figures	title
	-	-	-	-	Preface
Viana et al.	Brazil (Cenozoic)	S, SAM, WL, C	11	8	Coarse-grained contourite fan model
Akhmetzhanov et al.	N. Atlantic (Quaternary)	S, SS, BS, VS	16	0	Sandy contourite channels
Llave et al.	Gulf of Cadiz (Quaternary)	S, BHD	22	4	Erosional episodes vs. depositional episodes
Moraes et al.	Brazil (Palaeocene)	C, WL	11	11	Contourites as reservoir baffles
Rebesco et al.	Antarctica (Quaternary)	S, BD	9	3	Contourites vs. turbidites
Lucchi & Rebesco	Antarctica (Quaternary)	S, C, GS, X, B, CM	8	0	Glacial contourites
Carter	SW Pacific (Oligocene to Recent)	S, C, FMS, GS, O, TS	13	5	The role of intermediate-depth currents
Robinson et al.	California (Quaternary)	C, GS, X	10	0	Eastern boundary currents
Duarte & Viana	Brazil (Paleogene to Recent)	S, SAM, BD	12	5	Eustatic control of bottom currents
Verdicchio et al.	SW Adriatic Margin (Quaternary)	S, C	15	0	Eustatic control of bottom currents
Van Rooij et al.	NE Atlantic (Quaternary)	S, C	15	3	Cold-water coral growth due to currents
Hunter et al.	Greenland (Quaternary)	S	12	4	Temporal variation in current intensity
Esmerode et al.	Danish Basin (Late Cretaceous)	S, BHD	10	7	Chalk deposition in epeiric seas by contour currents
Georgiev & Botoucharov	S. Moesian Platform (M. Jurassic)	S, C, WL	11	3	Structural control of bottom currents
Hüneke	Gondwana and Laurussia (Devonian)	O, TS	15	0	Bottom-current induced hiatuses
Lima et al.	Brazil (Cenozoic)	BD	17	16	Hydrodynamic numerical modeling
total number of figures			207	69	

* B = biostratigraphy; BD = bathymetric data; BHD = borehole data; BS = bottom sample; C = core; CM = clay mineral; FMS = formation microscanner; GS = grain size; MSL = magnetic

susceptibility log; O = outcrop; S = seismic; SAM = seismic amplitude map; SS = side-scan sonar; TS = thin section; VS = video still; WL = wireline log; X = X-radiograph.

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