

venting downward percolation of fresh waters during periods of exposure and erosion in younger, overlying strata.

The transection of stylolites indicates that dolomitization took place at moderate depths of burial, from 500 to 1,000 m or greater.

The only fluids available for dolomitization during intermediate burial were subsurface brines released from adjacent and underlying compacting strata, a model first proposed by L. V. Illing. Detailed information on the diagenetic and geologic histories is needed before the origin of secondary dolomites can be interpreted widely.

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Dissolved Hydrocarbons in Coastal Waters of North America

No abstract available.

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Coorong Model for Penecontemporaneous Dolomite Formation in Middle Proterozoic McArthur Group, Northern Territory, Australia

Many types of penecontemporaneous dolomites have been explained in the literature by involving the well-known sabkha model. The various carbonates now precipitating in the ephemeral lakes of the South Australian Coorong Lagoon are the products of a more humid climatic and hydrologic regime. The distribution of carbonate rocks in the Coorong region is largely controlled by the hydrology of the depositional environment. Both primary and early diagenetic mineralogy can be related to regional hydrology as it has varied throughout the Quaternary. Characteristic sedimentary structures (including stromatolites) are formed in specific parts of the Coorong system, and these can be confidently identified in an ancient analogue, the 1,600-m.y.-old Yalco Formation of the McArthur Group of Australia. The resemblance between the ancient and modern environments, in terms of both sedimentary structures and mineralogy, is striking. The following conclusions can be drawn from the comparison:

1. All penecontemporaneous dolomites are not necessarily formed in an arid sabkha environment; a significant number may be formed in a more humid environment analogous to that of the Coorong, in which distinct climatic and seasonal factors prevail.

2. The lack of evaporite minerals or evaporitic casts in an ancient dolomite sequence does not mean that concentrated brines were never present. In the modern Coorong system, minor evaporite minerals are precipitated in the dolomite lakes during dry summer months, but are flushed out during winter by a reflux mechanism.

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Seismic Facies and Depositional Processes of Modern Off-Platform Carbonate Rocks in Northern Bahamas

Seismic facies analyses of more than 1,200 km of high-resolution air-gun seismic reflection profiles, combined with sedimentologic data from 150 bottom samples, and observations from submersibles, have resulted in correlation of reflection patterns with sedimentary facies for various off-platform carbonate environments in the northern Bahamas. Divergent to oblique progradational reflection patterns have been recorded from large (100 km × 50 km × 600 m) carbonate-sediment drifts of well-sorted fine sands off the northwest corners of both Little (LBB) and Great Bahama Bank (GBB). These drifts have been constructed since the middle Miocene by contour-following near-bottom flow of the Florida Current with velocities of up to 50 cm/sec and greater. Discontinuous subbottom reflections were observed at the base of the slope south of LBB and were found to correlate with proximal turbidites. An even, parallel, continuous subbottom reflection pattern is typical of basinal areas of pelagic oozes, deposited uniformly over wide areas, interbedded with thin, distal turbidites.

Large-scale (1 to 5 km across) mounded, chaotic to contorted-discordant reflection patterns were observed predominately on the upper slope south of LBB and appear to be indicative of large slumps. Smaller scale (less than 0.5 km across), mounded, chaotic reflection patterns, however, were found to correlate with in-situ constructional deep-water bioherms (lithoherms) found at the base of the slope west of LBB. Chaotic reflection patterns are common on upper slopes and are interpreted as a highly variable sediment gravity-flow and slump facies. Lenses of wavy, subparallel, chaotic reflectors found on the slope north of GBB are interpreted as channelized debris-flow deposits.

Recognition of similar reflection patterns from ancient off-platform limestone sequences may be useful in the seismic stratigraphic interpretations of paleo-environments and lithofacies.

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Application of Potential Field Data to Structural Interpretations in Idaho-Wyoming Thrust Belt

The integration of gravity and magnetic data is used to aid the determination of the structural configuration along a regional profile in the Idaho-Wyoming thrust belt. The magnetic data can be used for depth estimations of the crystalline basement. At the eastern limit of the thrust belt, the crystalline basement is conformable with the overlying autochthonous sediments. In this area, the magnetic data suggest that basement structures are present beneath the leading thrust sheet and thereby provide an attractive potential for hydrocarbon accumulation. Toward the west, the leading thrust cuts down to the basement so that structures indicated by the magnetic data are essentially of the basal decollement. Seismic data indicate that the allochthonous sediments above the decollement are essentially concordant with the basement; therefore, structures determined by