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AGI Activities

(No abstract submitted)

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Production of Reef-Margin Breccias by Submarine Cementation and Slumping of Carbonate Sands, Miette Reef Complex

Carbonate breccias in beds up to 1–2 m thick interbedded with coarse, reef-derived, carbonate sands and fine, basinal, terrigenous and carbonate muds are present seaward of the southeastern margin of the Devonian Miette Reef Complex of the Canadian Rocky Mountains.

The majority of the breccia fragments are cemented carbonate sand set in a matrix of noncemented sand. The allochems of both the fragments and the matrix are very similar in composition. The associated beds of carbonate sand that are intercalated with the breccias show similar textures. Within the latter, both *boudinage*-cemented layers and nodules with tension cracks, as well as slumped sequences of cemented sand in a noncemented matrix are seen. The breccia beds are therefore considered to have formed by differential submarine cementation of fore-reef carbonate sands coupled with downslope creep and slumping.

Breccias of this type do not record a profound break within the reef complex but correspond to times of maximum supply of sand to the forereef slope. Slumping is the direct result of instability of the sand accumulation on the slope during periods of more rapid sedimentation.

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Dipmeter Errors and Reliability

Dipmeter data can be used successfully to recognize structural anomalies and may yield valuable stratigraphic information provided one can distinguish valid dips and comprehend their geologic significance. A basic understanding of the techniques used to process the data and of the limitations of the recording tool can assist in achieving this goal.

Correlation, the process by which raw dipmeter information is transformed into dips, is the fundamental link between borehole information and geologic interpretation of diplogs, yet many geologists are not fully aware of how it can influence dip results. Because of correlation problems, generalized rather than true formation dips are generated; only if beds are strictly parallel will both be equal. The type of correlation program also determines the extent to which detailed dip changes are masked or revealed. If borehole irregularities are present or the strata are poorly bedded, slumped, or have local heterogeneities, revision of the correlation program may result in data improvement in some cases.

Dip errors and inconsistencies are present in almost every diplog. Mechanically induced errors arising from obvious malfunctions or limitations of the dipmeter tool can be detected by proper examination of the field-recorded dipmeter log. Other errors and inconsistencies are less easily detected and generally must be tolerated in the interpretation stage. Comparison of dips from duplicate logging runs is an important technique for estimating the magnitude of these more subtle errors and inconsistencies.

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Stratigraphic and Paleoecologic Significance of Ostracods from Shubuta Clay (Tertiary) of Mississippi

The Shubuta Clay at the type locality in southeastern Mississippi consists of about 75 ft of gray, marine calcilutite. It yields a diverse and well-preserved invertebrate fauna of ostracods, foraminifers, and nannofossils. Study of more than 8,000 specimens of ostracods, differentiated into 36 species, provided a basis for morphologic, evolutionary, and paleoecologic interpretation of this rich mid-Tertiary fauna.

Comparisons of the Shubuta ostracods with those of the subjacent Pachuta Marl and the superjacent Red Bluff Clay indicate that the Shubuta fauna is clearly intermediate in character; however, a marked faunal change is found about 45 ft above the base of the Shubuta at the type locality. The lower assemblage is characterized by *Bairdia woodwardensis* Howe and Law, *Cytheropteron montgomeryensis* Howe and Chambers, *Digmocythere russelli* (Howe and Lea), and *Hermanites? dohmi* (Howe and Chambers) whereas the less diverse upper fauna is dominated by *Haplocytheridea montgomeryensis* (Howe and Chambers) and lacks many forms present in the lower part. The vertical change from high diversity to low diversity may reflect a shift to deeper water deposition during the Shubuta interval. This interpretation is corroborated by a comparison of the Shubuta ostracods with the depth distribution of related living forms.

The paleontologic evidence suggests correlation of the lower part of the Shubuta with Jacksonian (Upper Eocene) strata of the Gulf Coast. In contrast, the ostracods of the upper part show a closer affinity to Vicksburgian forms.

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Knifley Sandstone: Early Mississippian Infralittoral Sandstone Body

Stratigraphic and petrologic relationships indicate that the Knifley Sandstone was the product of littoral to infralittoral processes, which deposited sands at the shoaling inner margins of a shallow, Early Mississippian sea.

The Knifley Sandstone is an elongate body, 30 mi long, 5 mi wide and up to 200 ft thick, within the Ft. Payne (=Borden) Formation (Lower Mississippian) of south-central Kentucky. This sandstone body trends northwest-southeast, parallel with the regional depositional strike. It is offlapped to the southwest by 2 elongate limestone bodies of similar dimension and orientation.

The thick widespread Ft. Payne (=Borden) Formation consists of bioturbated, siliceous dolosiltites. The Knifley Sandstone is a coarsening-upward sequence of fine- to medium-grained, glauconitic, dolomitic, subgraywackes, which grade downward into the underlying Ft. Payne (=Borden) dolosiltites. Extensive bioturba-