

symmetrical, V-shaped hummocks. These vegetated ridges (up to 1 m high) are positions of former beach ridges and tidal-channel levees. Sediments in the hummocks are thin-bedded (3-15 cm), un lithified pellet sands with pronounced fenestral fabrics. Sloping flanks of the hummocks are composed of lithified crusts (up to 3 cm thick), commonly separated by un lithified sediment layers. 3. Initial infilling of the lagoons in the form of closely spaced, circular to ellipsoidal Carolina bays. Bay margins form by spit accretion of well-sorted pellet and skeletal sands. The bays themselves fill with poorly sorted, muddy pellet sands. 4. Bay sedimentation generates a mosaic of isolated small sand bodies within a muddy, pelletal, massive sediment. Vertical infilling of the lagoons in the form of laterally continuous, alternate thin beds of blue-green algae and pellet mud. (5) Capping of the sequence by laterally continuous, thin crusts of aragonite-dolomite.

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#### TECTONICALLY CONTROLLED SEDIMENTATION DURING MIDDLE PALEOZOIC IN NORTHEASTERN NORTH AMERICA

The Silurian-Mississippian time interval in northeastern North America can be subdivided into major interregional, depositional, and erosional episodes, reflecting vertical movements of the North American crustal plate. A detailed analysis of the preserved depositional record indicates the presence of 6 major unconformity-bounded sequences on the eastern craton, 3 in the transitional region of New York and Pennsylvania, and 2 on the Appalachian plate margin of the New England States and the Maritime Provinces. Good biostratigraphic and lithostratigraphic control clearly demonstrates that this decrease in the number of sequences is due to an easterly increasing change in tectonic style reflected by higher rates of subsidence, less uniform erosional fragmentation, and better preservation.

The interregional pattern of preservation and the predominance of carbonate facies suggest broad epeirogenic movements during Silurian time. Pronounced facies changes and variations in thickness during Early and early Middle Devonian time characterize the transition from epeirogenic to orogenic movements of the Acadian orogeny. Isostatic uplift and foredeep development mark the late Middle and late Devonian. The Mississippian record indicates greatly increased subsidence on the craton and tensional block faulting, with renewed volcanism on the Appalachian plate margin.

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#### FORAMINIFERAL AND NANNOPLANKTON BIOSTRATIGRAPHY, PALEOECOLOGY, AND BASINAL RECONSTRUCTION, ANITA FORMATION, WESTERN SANTA YNEZ MOUNTAINS, CALIFORNIA

The Anita Formation crops out along the crest of the Santa Ynez Mountains, California, from Santa Ynez Peak westward to Point Conception. Planktonic and benthonic foraminiferal faunas and calcareous nannoplankton floras were studied from 6 measured sections between Arroyo el Bulito and Santa Ynez Peak. In general, Anita Formation strata are assigned to the time interval from early Paleocene to early middle Eocene on the basis of prevailing planktonic correlations. Also from planktonic evidence, reported Ynezian benthonic foraminiferal assemblages appear to be early Paleocene to late Paleocene in age; Bulitian assemblages are of late Paleocene age; Penutian assemblages are late Paleocene in some sections and early Eocene in others; Ulatisian assemblages are late Paleocene to early middle Eocene. The time-transgressive nature of the benthonic provincial stages is apparent; the stages become geologically younger toward the basin margins as well as stratigraphically higher. Furthermore, strata mapped as Anita Formation by Dibblee have been found to be of late Cretaceous age in several areas.

Lithologically, the Anita Formation can be split into three gross members, which can be mapped throughout the Western Santa Ynez Range. The unit is divisible into the following stratigraphic units, all of which are typed in the upper Arroyo el Bulito area: Gato siltstone (upper member); Augustin mudstone (middle member); and Bulito siltstone (lower member).

The Anita Formation is thickest south of the present Santa Ynez fault system, whereas northward, telescoped sections occur, and the Anita gradually disappears. This relation suggests that the Santa Ynez fault may have been a prominent structural feature in early Paleogene time. Eastward the Anita wedges into "Matilija" type clastics, which were shed from the nearby San Marcos high. Southward the Anita disappears under the Santa Barbara Channel.

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#### SEDIMENTATION AND DIAGENESIS IN DEEP FOREREEF, BRITISH HONDURAS BARRIER AND ATOLL REEFS

The top of a near-vertical escarpment at 70 m marks the change from luxuriant organic growth that typifies the shallow forereef, to physical and chemical sedimentation that characterizes the deep forereef. Off the southern barrier reef and the leeward side of Glovers Atoll, this escarpment extends to 120 m; on the seaward side of Glovers Atoll, it continues to abyssal depths. Where the base of the escarpment is at 120 m, it is buried by the forereef rise, a wedge of talus and sediment whose slope flattens basinward.

The escarpment has numerous projecting ledges, caves up to several meters deep, and occasional near-vertical fissures tens of meters high. Sediments from above mantle and infill all irregularities on the escarpment; sticks and plates of coral are stacked on projecting ledges; algal-plate (*Halimeda*) sand and "lime" mud cloak ledges and floor caves and small cavities. Rock samples from the outer meter of the escarpment, between 95 and 110 m deep, are well-cemented mixtures of algal-plate (*Halimeda*) sand, "lime" mud, whole and fragmented reef corals, and crustose, coralline algae. Specimens show multiple generations of sponge and mollusk borings, sediment infill, and cementation by magnesium calcite and aragonite that almost obliterates many primary depositional fabrics. Two specimens of unaltered reef corals from this rock have radiocarbon ages of 2,340 and 7,835 years B.P.

On the barrier reef the upper forereef rise at the base of the escarpment is a talus slope of blocks, surrounded by algal-plate (*Halimeda*) sand and "lime" mud. Talus blocks as large as 20 m clearly are derived from the escarpment; all stages of formation, from jointed rock face to large blocks of limestone slightly displaced from the wall, are visible. Within 100 m of the base of the escarpment, the blocks of talus decrease abruptly and algal-plate (*Halimeda*) sand is increasingly diluted by pelagic muds.

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#### FAULTS AND EARTHQUAKES IN MONTEREY BAY REGION, CALIFORNIA

The structure of the continental margin, between Monterey Bay on the south and Point Reyes on the north, is dominated by a northwest-trending belt of rocks composed of continental crust (Salinian block) that is separated from oceanic crust on the east by the active San Andreas fault system, and on the west by the Sur-Nacimiento fault zone. Recent marine geophys-