of the Cuchumatanes Mountains of northwestern Guatemala and the once adjacent region in central Guatemala. By moving the blocks back to their pre-slip positions and examining the union of modern topographies, several interesting correlations are noted. In the pre-slip position the present drainage divide of the Cuchumatanes Mountains on the northern block closely matches the present drainage divide between the Polochic and Chixoy Rivers on the southern block. Ridge and drainage trends extend across the fault so that, in the reconstructed position, a missing part is restored to the annular drainage pattern of the Cuchumatanes domal uplift. The Chixoy and Polochic Rivers on the southern block probably flowed into the present Selegua and Cotzal Rivers respectively. Before slip, the region south of the fault drained northward around the highest elevations of the Cuchumatanes Mountains, but after slip the drainage of rivers on the southern block was shunted into the new, fault-controlled Cuilco and eastern Polochic River channels, vastly reducing the discharge across, and erosion of, the northern block. Significantly lower terrane on the southern block is probably due in large part to this erosional factor.

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Bank-Barrier Reef Morphogenesis, St. Croix, United States Virgin Islands

Bank barriers are the major structural reef type in the eastern Caribbean, yet their internal structure and formation process are poorly understood. Twenty-six core holes drilled along the northern St. Croix barrier and on a transect combined with a ship-channel section through the southern bank barrier have shown that this is a bar-type structure which consists of a series of patch reefs within a carbonate sand and rubble matrix capped by reef-crest and fore-reef facies. Locally, reef linearity and location are controlled by a 4-m limestone step of Pleistocene age.

These bank reefs apparently were initiated by shelf-current deposition of carbonate traction load in a bar configuration. Scattered corals—*Porites porites, Diploria* spp., *Acropora cervicornis*, and dominantly *Montastrea annularis*—acted to stabilize the bank. Framework-dominated patch reefs developed at scattered locations and depths as the bank grew upward. As the reefs built into shallow water, carbonate production increased, eventually coalescing them into a continuous reef crest.

Core return shows that the structure is characterized by little cementation. Cement occurs in localized lenses within the structure just as it does along the present reef surface. Framework construction is concentrated in patch-reef, reef-crest, and fore-reef facies. This type of construction produces highly permeable structures with extremely high local porosity. Extensively cemented caps occur only in areas having low accumulation rates and in areas of high energy.

Bank-barrier reefs are probably also important in the Indo-Pacific in exposed non-atoll situations, but their occurrence is generally not recognized. Descriptions of Mesozoic and Cenozoic reefs suggest that the bank reef is an extremely important but little understood type in the fossil record also.

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Oil Exploration in Pre-Salt and Post-Salt Sequence of West Africa—Results in Cabinda

The Aptian evaporites separate two different oil habitats in the offshore of Cabinda: the pre-salt and the post-salt sedimentary sequence, with three-quarters and one-quarter of the oil production, respectively. In the pre-salt sequence, three oil fields are being produced: Malongo North, Malongo West, and the Block 121 trap. In the post-salt, three shallow accumulations are present, in the Malongo North area.

The pre-salt sequence is extremely variable in thickness, and its sedimentary environment is strictly connected with the initial rifting between Africa and South America. In the earliest Cretaceous, a basement peneplane was flooded by a few fluviatile streams along which the thick Lucula sands were accumulated. Production from Malongo North and part of Malongo West fields comes from two of these independent sandstone bodies.

Subsequent subsidence of the basin resulted in the deposition of the Bucomazi black shales in a lacustrine environment. These shales may grade laterally into the Toca carbonate rocks, mainly as a function of the water depth of the lake, every shallowing being accompanied by an increase in carbonate deposition. The Toca carbonate rocks around the Malongo West basement high are the second important reservoir of the field. They are largely dolomitized rocks derived from algal biostromes or pelecypod coquinas.

After the Aptian salt deposition and the definitive opening of the Atlantic Ocean, the basin was tilted to the west, its original trough shape being modified into a monocline. During the Albian, the eastern part of Cabinda offshore was covered by continental red sandstones of the Vermelha Formation. Seaward of this, a definite shallow marine environment existed where the Pinda carbonate beds were deposited, frequently substituted by sandstones and siltstones. These are the reservoir rock of GCO and Mibale fields in Zaire. After a brief marine transgression during the Cenomanian, the heterogeneous Senonian sediments of the Iabe Formation form the reservoir rock of the shallow Malongo fields.

It seems that the proximity of a growth fault may enhance the quality of the post-salt reservoirs: silt and clay accumulated along the downthrown sides of the faults, while salt flowage created localized highs where clean carbonate rocks were deposited in a high-energy environment.

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Deformational Structures in Pliocene Bouse Formation Near Vidal, Southeastern California

Ball-and-pillow, flamelike, and load structures accompanied by convolute laminations in the Pliocene Bouse Formation are thought to be caused by slumping of water-saturated sediments. New structural data suggest that these structures formed by foundering and by lateral movement of unconsolidated sand into hydro-