penetration of hard formations in order to recover the oldest rocks in the eastern Caribbean Sea; (2) Curaçao to Kingston, dedicated primarily to geochemical studies of the interstitial waters and to organic geochemical analysis of anerobic sediments from the Cariaco trench; (3) Kingston to Balboa, where attempts were made to reach the oldest rocks in the western Caribbean adjacent to Panama and to establish biostratigraphic standard sections. Paleontologists were looking for deep-sea evidence for the final closing of the Isthmus of Panama through the isolation of the Caribbean fauna from the Pacific fauna.

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SEDIMENTOLOGY OF RESERVOIR SANDSTONES IN EL-MORGAN FIELD, GULF OF SUEZ, U.A.R.

Well cuttings and core samples from 17 wells in El-Morgan field were studied for grain-size distribution, degree of roundness, and feldspar content. The sandstones are Miocene and generally are arkose or subarkose. Mechanical analysis indicates that the sand mode achieved good sorting in a high-energy beach environment, and then was transported en masse by strong waves and currents to a neritic environment where it became mixed with finer sand and clay. The sandstones are leptokurtic and positive skewed indicating a nearby source area. Study of roundness of the sand grains reveals a mixed source, mainly plutonic, with minor contributions from a preexisting sedimentary source, presumably a Cretaceous or Nubian sandstone.

Maps showing the variation in average grain size, feldspar content, and percent of sand in the formation, clearly indicate a source area south and southwest of the field. It is believed to be the nearby Zeit Range. The lack of feldspar alteration is attributed to rapid erosion as a result of the high relief attained by large-scale block faulting in pre-Miocene and early Miocene times and to conditions of extreme aridity.

The sands were deposited from traction currents. The bottom topography of the Miocene sea controlled the amount of turbulence and determined the size, shape, and distribution of the sands.

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ORDOVICIAN GRAPTOLITE FACIES AND NORTH ATLANTIC CONTINENTAL DRIFT

Pre-Caradoc graptolite faunas of North America and Europe are believed to indicate a significant divergence into 2 major facies associations: a "Pacific" fauna which is characteristic for Australia and most of North America, and an "Atlantic-Baltic" fauna which is documented in British and Scandinavian sequences, and which has been reported recently from Newfoundland.

Pelagic graptolites have not received much attention for their potential as facies indicators, but studies of Appalachian and European graptolite occurrences have demonstrated that two contrasting faunal developments existed during the Early Ordovician with both facies occurring on both sides of the Atlantic.

North American circumcratonic pelagic seas apparently provided a prevalent west-to-east current pattern which is indicated by periodic waves of immigrant Pacific graptolites in the northern Appalachians of Quebec and western Newfoundland, as well as in western Ireland and the Atlantic Norwegian Caledonides. This facies is in contrast with penecontemporaneous graptolite congregations of epicratonic black shales in the Oslo region, southern Sweden, Wales, eastern Ireland, and northernmost Newfoundland.

The juxtaposition of both facies in both North America and Europe suggests the existence of a continuous physical barrier during part of the Early Ordovician. The axis of this barrier extended from Newfoundland to central Norway. Only a pre-drift continental plate margin association of North America and Europe makes this assumption tenable.

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FORAMINIFERAL STUDIES: WILKINSON BASIN, GULF OF MAINE

Sediment samples from a 280-m core taken in the Wilkinson basin, Gulf of Maine, have been studied for foraminiferal content. The sediments are dusky yellowish-brown silty clay and presumably represent particles carried by glacial meltwater into the Atlantic Ocean during the latest period of continental deglaciation.

Several features set the foraminiferal fauna apart from the normal open-shelf fauna. There is a distinct lack of arenaceous species in these sediments. *Eggerella advena,* customarily abundant, is lacking, and only *Hyperammina elongata* and *Trochammina inflata* are present in trace quantities.

Bolivina fragilis and *B. pseudoplicata* dominate the calcareous fauna, with fewer *Glandulina laevigata, Guttulina glacialis,* and *Nonionella labradorica* present. The species abundance and diversity are large and compare favorably with other northern areas.

The faunal list from the basin does not compare with species found at comparable depths on normal shelves. The fauna appears mixed with shallow-water elements derived from relict sediments on the shelf and bordering the basin. By far the majority of species found are from depths of 60–75 m. A few ubiquitous species, *Bulimina marginata* and *Cassidulina norcrossi* are found at greater depths.

Planktonic/benthonic ratios increase upward attesting to an influx of planktonic forms associated with rising sea level.

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LATE PLEISTOCENE-HOLOCENE SEDIMENTATION HISTORY OF CAPE KENNEDY INNER CONTINENTAL SHELF

Lithologic analyses of 91 cores averaging 10 ft in length, radiocarbon dates of *in situ* peat deposits from the shelf, and interpretation of 360 mi of high-resolution continuous seismic profiling indicate a complex sedimentation history for the Cape Kennedy inner continental shelf.

Two prominent and continuous acoustical horizons in the upper subbottom can be traced throughout the 200 sq mi grid studied. The lower reflector lies at −60 to −110 ft MLW and is characterized by an irregular surface probably resulting from erosive processes during long-term subaerial exposure. The upper horizon lies at depth of −40 to −90 ft MLW and generally 2–15 ft below the existing bottom. This horizon is relatively smooth and dips seaward at a low angle. Internal reflectors between the upper and lower horizons suggest prograding beds. Cores penetrating the upper reflector contain subaerially cemented sands and recrystallized shells.