Sedimentologic Processes in Wilmington and South Wilmington Submarine Canyons as Indicated from DSRV *Alvin*

Three submersible dives in DSRV *Alvin* were made on the continental rise seaward of Atlantic City, New Jersey: two in Wilmington Canyon and one in South Wilmington Canyon. The dives, made on features observed in midrange sidescan sonar records reveal a sharp contrast in physiography between the two canyons and provide an insight to the sedimentologic processes associated with canyon development.

On the upper rise, Wilmington Canyon is characterized by a well-developed meander pattern with alternating steep and gently sloping side walls. The steep channel walls correlate with the outside (concave) part of a meander bend and are segmented by numerous steep-walled, steplike depressions. Therefore, undercutting at the base of the channel wall, accompanied by localized slumping, is inferred. These depressions are missing on the gently sloping channel walls. Unconsolidated sediment, in excess of 1.3 m thick, is present in the channel axis but is generally missing in the depressions on the channel wall. The high quartz sand content (30%) in the channel sediments and the paucity of unconsolidated sediment in the depressions indicate recent activity.

In South Wilmington Canyon various deformed and displaced(?) sediments support a previous suggestion of large-scale slumping. These features include upturned clay horizons at the base of the wall, stratigraphically overlain by disaggregated gravels, a loosely bound gravel conglomerate, and oxidized sandstone horizons. A tubular object 1 m long, tentatively interpreted as a tree root cast, was recovered from the sandstone. A meander pattern was not found in South Wilmington Canyon.

SWAIN, F. M., Univ. of Delaware, Newark, DE

Cretaceous Ostracoda from Wells in South Carolina

A fauna of approximately 70 species of Cretaceous ostracods has been recovered from 40 wells and a few outcrop samples in the South Carolina coastal plain; 51 of the species are assigned to, or are believed to be referable to, described species. The rest of the species are given affinitive assignments, or are left in open nomenclature.

In the present collection, 20 of the species are tentatively considered to be restricted to beds of Navarroan (approximately Maestrichtian) age; 13 additional species are possibly restricted to beds of Tayloran (approximately Campanian) age; and 7 other species are restricted to beds of Austinian (approximately Santonian and Coniacian) age. One species of the collection is representative of pre-Austinian deposits.

Several of the species also occur in the COST Atlantic wells and are useful for correlation with offshore Cretaceous deposits.

TWICHELL, DAVID C., U.S. Geol. Survey, Woods Hole, MA

Sediment Transport on Georges Bank and Southern New England Shelf

Four bed-form provinces have been identified on Georges Bank by means of sidescan-sonar and echo-sounding techniques: large sand waves, small sand waves, megaripples, and featureless sea floor. The large sand waves are on the bank crest where tidal currents exceed 70 to 80 cm/sec; they are bordered, north and south, by areas of small sand waves and/or megaripples where tidal currents are 40 to 80 cm/sec. Featureless sea floor is present farthest from the bank crest where tidal currents are less than 40 cm/sec.

Directions of sediment transport can be inferred from bedform asymmetry and from surface-sediment texture. On the crest of the bank large sand waves are on northwest-striking ridges. The asymmetry of these sand waves indicates southward transport on one side of the ridges and northward transport on the other, implying erosion from the troughs separating the ridges, and growth of the ridges. The asymmetry of the small sand waves along the south side of the bank indicates that sand is also transported southward away from the bank. Though the asymmetry of megaripples could not be determined in the study, the presence of megaripples between the sand-wave provinces and areas of featureless sea floor suggests decreasing effectiveness of sand transport away from the bank crest. This pattern of sand transport is supported by surface-sediment texture, which becomes progressively finer both north and southwest away from the crest of Georges Bank. One end of the sediment-transport path is the southern New England shelf where silt and clay are deposited. Here tidal currents drop from 30 to 6 cm/sec, permitting the fine suspended sediments to accumulate.

UMPLEBY, D. C., Geol. Survey of Canada, Dartmouth, N.S.

Structural Aspects and Hydrocarbon Potentials of Basins on Continental Margins Off Labrador and Newfoundland

The continental shelf of Labrador and Newfoundland is underlain by several discrete subbasins. On the western margin of the Labrador Sea, north of the east-trending, east-plunging Cartwright arch, the continental shelf is underlain by up to 10 km of Upper Cretaceous to upper Tertiary marine clastics that constitute the Hopedale-Saglek basin. These sediments overlie a narrow rifted basin of early to middle Cretaceous age, informally called the Erik graben.

Further south, between the Cartwright arch and the axis of the Avalon uplift, the continental shelf is more complex. This region contains the St. Anthony basin, an Appalachian successor basin with upper Paleozoic coal measures and red clastics; the somewhat sinuous, generally northeast-southwest trending Avalon basin containing mixed facies of Mesozoic and Tertiary age; and an unnamed, early Tertiary depocenter having a NNW-SSE trend which is infilled with mostly fine-grained marine clastic rocks.

Hydrocarbon occurrences discovered can be explained in terms of the nature and thermal maturity of probable source rocks and the time of trap formation. Liquid hydrocarbons have only been found in significant amounts in the Avalon basin where traps are supra-adjacent to mature Upper Jurassic source rocks. However, in this basin Lower Cretaceous deltaic sequences can be expected to generate gas. In the remaining basins the sequences contain organic matter that is largely terrestrial and/or at a low level of thermal maturity. In these basins, a low potential for gas is likely.

WADE, JOHN A., Geol. Survey of Canada, Dartmouth, N.S.

Hydrocarbon Model for Scotian Shelf

The Scotian Basin, which in part underlies the Scotian Shelf offshore eastern Canada, contains up to 12 km of Mesozoic and Cenozoic sedimentary strata and has all the prerequisites for hydrocarbon occurrence. Data sets—stratigraphy, structure, organic geochemistry, kerogen type and maturity, geothermal history, and oil and gas occurrence—show that the hydrocarbons encountered in the wells drilled to date are in