The neotectonic activity along the inner continental margin and seismic activity along extensional faults inland from it strongly suggest that slight rifting is still occurring from the opening of the Atlantic. The present downwarping at the continental edge is now concentrated in irregularities, embayments, that possibly developed by sagging over basement structures.

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Organic Matter Type and Hydrocarbon Occurrences on Eastern Canadian Margin

The type of organic matter present in the Mesozoic-Cenozoic sections of offshore eastern Canada is related to the geologic histories of the western North Atlantic Ocean and the Labrador Sea. On the Scotian Shelf–Grand Banks, marine organic matter (amorphogen), largely the remains of phytoplankton and the primary precursor of oil, did not become abundant until the Late Jurassic, and then only where marine conditions were more fully developed. Floods of terrestrial organic material in deltaic sediments considerably diluted the amorphogen in the Early Cretaceous, particularly on the Scotian Shelf. In contrast, amorphogen continued to be common in the East Newfoundland Basin. Major marine transgression led to uniformly abundant amorphogen throughout the Late Cretaceous and Cenozoic of the Scotian Shelf and Grand Banks, with terrestrial organic material only becoming important in the Neogene. Coloration studies indicate that sediments are generally immature in the Late Cretaceous–Cenozoic, except in: (1) areas where the Cenozoic is extremely thick in the East Newfoundland Basin and Labrador Shelf; and (2) where anomalously high geothermal gradients result as from salt intrusion. Older strata, where mature, are generally gas-prone, except where amorphogen is common. The Labrador Shelf shows a similar but later sequence of organic types with amorphogen being common only in the Paleogene. Our results are consistent with hydrocarbon distribution encountered to date in offshore eastern Canada. They also indicate that the relative abundance of amorphogen increases in an offshore direction, of particular importance where the type of organic material is the limiting factor for oil generation as in the Late Jurassic–Early Cretaceous.

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Frontier Exploration—Southeast Georgia Embayment

During 1978 Transco Exploration Co. and its partners successfully bid on five Sale 43 tracts in the Southeast Georgia Embayment. These leases were acquired on the basis of a subunconformity play different from other prospects in the sale area. During late 1979 Transco, as operator, drilled an exploratory well which will influence future exploration of the prospect.

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Biostratigraphic Changes in Spore and Pollen Record in Middle to Upper Cretaceous of Atlantic Coastal Plain as Reflection of Sea-Floor Spreading, Global Cooling, and Evolution of Wind Pollination

During the middle Albian and continuing through the late Cenomanian, changes in the spore and pollen record of the Middle Atlantic Coastal Plain suggest cooling climatic trends. The decrease in temperature is indicated by a reduction in palynomorphs associated with humid tropical conditions and an increase in gymnosperm pollen. These trends are paralleled by a gradual but continuous evolution of angiosperm types from tricolpate to triporate pollen. The latter events may be associated with cooling and increasing seasonality that would favor selective pressures for the evolution from early insect-pollinated angiosperms to well-developed wind-pollinated types by late Cenomanian. This climatically driven evolutionary trend reaches its acme during the Coniacian-Santonian climatic maximum.

Climatic cooling during the middle Cretaceous, as suggested by oxygen isotope studies, is believed to be related to increased sea-floor spreading. Such plate movements resulted in the fractionation of the circumglobal tropical Tethyan seaway as well as an increasing rate of northward and counterclockwise movement of the Middle Atlantic coastal margin during middle to Late Cretacous times.

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The Hibernia Structure

The Chevron et al Hibernia P-15 well discovered hydrocarbons on the Hibernia structure in late 1979. Since that time, the operator Mobil Oil Canada, Ltd., and partners (Gulf Canada Resources, Inc., Petro-Canada Exploration Inc., Chevron Standard Limited, and Columbia Gas Development of Canada, Ltd.) have drilled four appraisal wells on the feature. Results from these wells indicate the presence of a major oil accumulation. Hibernia is located on the Newfoundland Grand Banks 315 km east-southeast of St. John's. Local stratigraphy and seismic structural data indicate potentially productive hydrocarbon zones.

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Stratigraphy and Sedimentology of Upper Cretaceous (Raritan) Sediments of Staten Island, New York

Cretaceous sediments on Staten Island have been considered to represent Raritan and Magothy formational units. Recent investigations of subsurface samples by Cousminer and Connors have resulted in correlations with Raritan Formation members exposed in northern New Jersey. Raritan Formation Members identified by pollen stratigraphy and petrologic studies were the Sayreville Sand Member and the Woodbridge Clay Member. No Magothy formational equivalents were found. New data have been collected from outcrop samples for correlation studies. These outcrops are slowly being destroyed by human activity.

Outcrop samples were collected from three localities and analyzed for grain-size distribution and mineralogic content. The Sayreville Sand Member on Staten Island is a light-colored, fine- to medium-grained, thin- to thick-bedded sand. Variegated clays and silts, thin- to thick-bedded, are layered with the sands. Thin micaceous silt and clay beds containing abundant lignitic fragments and some sulfide minerals are also present. The sands are extensively cross-stratified with small planar beds. Quartz is the principal component of the sand