tion was folded. The formation may have been compressed as it was translated through a concave part of the Glooscap fault.

The 1,800-m thick Parrsboro Formation was then deposited in the Parrsboro area during the late Namurian and early Westphalian. The Parrsboro Formation consists of fining-upward sandstone units, thin sandstone beds, and mudstones with roots. It is interpreted as a fluvial and lacustrine sequence. The great thickness of the formation may be due to the formation of an extension basin in a convex part of the fault system. A basal conglomerate of the Parrsboro Formation was derived from the east, presumably from the uplifted area at the concave part of the fault. Throughout the rest of the formation a gradual change in the paleocurrent direction from eastward to southwestward may be due to migration of the depocenter of the extension basin.

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Preliminary Molluscan Biostratigraphy of Gulf of Alaska Tertiary Province

Studies of large collections of mollusks from numerous measured stratigraphic sections in the Gulf of Alaska Tertiary province permit recognition of eleven molluscan zones within the Poul Creek and Yakataga Formations. Correlation of these zones throughout the province illustrates the time-transgressive nature of the boundary of the two formations—a transgression across four molluscan zones between Kayak Island to the west and the Lituya district to the east. The age variation of the base of the Yakataga Formation is from earliest early Miocene to late Miocene. The use of these molluscan zones elucidates the disconformable relation between the two formations and the local absence of entire zones.

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Porosity Evolution of Niagaran Thornton Reef, Northeastern Illinois

The Thornton Reef has long been a model of reef sedimentology, but as thick tar occurs in the upper 22 m of the porous and deeply eroded buildup, Thornton is also a well-exposed fossil oil field.

Thornton Reef is about 2 km in diameter and bowl-shaped in cross section. The reef consists of radially and steeply dipping flank beds of dolomitized crinoidal wackestone and minor coral boundstone. Reef porosity (5 to 10%) is dominantly secondary, consisting of fossil molds, vugs, intercrystal voids, and fractures. At time of deposition porosity was probably high (50 to 70%), and consisted largely of intraparticle and interparticle pores of all sizes. Abundant hardgrounds and palisade-cemented grainstones suggest major reduction of depositional porosity by syndepositional submarine and marine phreatic carbonate cementation. Secondary dolomite preferentially replaced abundant fine-grained carbonate sediment but only partly replaced fossils. Leaching removed the remaining calcitic parts of the fossils, slightly enhancing porosity. Extensive fracturing of the reef began at deposition and continued throughout the reef's geologic history, producing fractures that may extend hundreds of meters laterally. The fractures may be open or filled with syndepositional carbonate or younger terrigenous sediment. Thornton Reef's superb exposures and reservoir scale assure its importance to geologists studying reef facies and porosity.

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Eastern Green River Basin—A Developing Giant Gas Supply from Deep Overpressured Upper Cretaceous Sandstones

During the past 4 years, a previously unexplored 3,000 sq-mi (4,828 sq km) overpressured area in the eastern Green River basin has developed into a major gas province which should ultimately produce more than 20 Tcf of gas. Production is from lenticular sandstones in the Upper Cretaceous Lewis Shale and Mesaverde Group. Abnormally high fluid pressure gradients of .5 to .86 psi/ft are caused by the generation of natural gas from coals in the Mesaverde Group and perhaps from other source rocks. Gas generation from coals is believed to increase exponentially with increases in temperature and depth. Therefore, the largest volumes of gas and the highest pressures have been generated in the deepest parts (15,000 to 20,000 ft, 4,572 to 6,096 m) of the basin. The deepest areas are sparsely explored but may prove to be the most productive parts of the overpressured area for the following reasons. (1) Higher pressures result in more gas in the available pore space. (2) Sufficient gas should have been generated at these depths to fill all available pore space in Mesaverde and Lewis sandstones. More total pay should thus be expected than in shallower areas where water production is a common problem. (3) Higher pore-fluid pressures increase the ease with which natural fracturing of rock