mation, which is exposed in southern Alaska and along the Alaska Peninsula. The megafossil *Buchia rugosa* was found in quantity in one dredge haul. This Late Jurassic pelecypod implies that the rocks were deposited in a neritic or shallow-water environment. These Jurassic strata are overlain unconformably by diatomaceous mudstone or sandstone as old as late Eocene or early Oligocene.

Geophysical work indicates that the Jurassic rocks were recovered from an acoustic basement complex that can be traced northwestward from near the western tip of the Alaska Peninsula to Siberia, a distance of nearly 1,250 km. The Mesozoic basement complex consists structurally of a series of interconnected ridges that underlie the outer shelf and crop out along the adjacent continental slope. Previous theories on the tectonic evolution of the Bering Sea implied that the continental margin should be underlain either by (1) deformed Mesozoic trench or slope deposits that were structurally accreted to the margin by oblique convergence between the Kula(?) and North American plates or (2) by disrupted fragments of Mesozoic slope beds deposited along a transform or strike-slip boundary that separated the two plates. However, rocks dredged from the margin now indicate that a belt of shallow-water Upper Jurassic sandstone underlies the Beringian margin between southwestern Alaska and eastern Siberia. This belt, which structurally may include younger rocks, subsided in early Tertiary time to form the existing Beringian margin. Collapse along the margin was more than 3 or 4 km; in some areas beneath the outer shelf, the Mesozoic framework may have subsided more than 10 km.

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Distribution of Salt Structures in Gulf of Mexico

Known collectively as "salt domes," slender diapiric stocks, broad massifs, anticlinal masses, low-relief swells, and pillowy lobes of Middle to Upper Jurassic salt dominate the structural fabric of large parts of the continental margins and deep basin of the Gulf of Mexico.

In the northern Gulf of Mexico, large salt structures are concentrated on the Texas-Louisiana slope west of the Mississippi fan and on the Rio Grande slope east of Brownsville, Texas. Salt stocks dot the continental shelf off Louisiana, around the DeSoto Canyon off the Florida Panhandle, and across the upper Mississippi fan between the Sigsbee and Florida Escarpments. At the foot of the continental slope, an almost continuous wall of coalesced salt structures abuts relatively undeformed strata of the continental rise along the Perdido and Sigsbee Escarpments marking the seaward boundary of the northern gulf salt-dome province.

In the central gulf, the almost featureless Sigsbee Plain is interrupted by the surface expressions of but a few of the more than 50 large salt diapirs that pierce thousands of meters of abyssal strata along a narrow belt parallel with the northwestern face of the Campeche Escarpment. Seismic reflection data between the Sigsbee Knolls and the Campeche Escarpment record the undulating surface and undeformed base of the mother-salt layer and indicate updip pinchout at the base of the Campeche platform.

In the southwestern gulf, knolls and open basins on the slope are underlain by masses of diapiric and nondiapiric material thought to be salt. Though similar to the northern gulf slope in topographic character and to some extent in internal structure, the Golfo de Campeche slope includes a considerable number of broad, linear hillocks composed of thick sections of slope and abyssal strata that were uplifted, folded, and faulted by tectonic events apparently unrelated to salt mobility.

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Facies and Reservoir Characteristics of Shelf Sandstone, Hartzog Draw Field, Powder River Basin, Wyoming

Hartzog Draw field is a stratigraphically controlled oil reservoir which produces from the Upper Cretaceous Shannon Sandstone at depths from 9,000 to 9,600 ft (2,700 to 2,880 m). The producing interval consists of a large, midshelf sand-bar complex deposited below effective normal wave base more than 100 mi (160 km) from shore. The productive interval in the bar complex has a maximum thickness of 65 ft (19.5 m), is over 21 mi (34 km) long, and up to 3.5 mi (5.6 km) wide. Over 170 wells have been completed on 160-acre (64 ha.) spacing since its discovery in 1975, and ultimate oil recovery may exceed 100 million bbl.

The reservoir is completely enveloped in shale, has a solution-gas drive, no water table, and no produced formation water. Even zones calculated from logs to have water saturations of over 65% do not produce water. Net pay is primarily a product of porosity, permeability, and thickness of the sandstone, and is directly related to sedimentary facies. Of six facies observed in cores, only the central bar facies—a high angle, trough-cross-bedded, glauconitic quartz sandstone—is a consistently high-quality reservoir. Two others, the bar-margin facies, a ripple to trough cross-bedded sandstone with abundant shale and siderite clasts, and the interbar facies, a rippled, interbedded sandstone and shale, generally are marginal-quality reservoirs.

Data from three cores indicate the central bar facies to have a significantly better average porosity and permeability (12.7%, 6.5 md) than either the bar-margin facies (8.1%, 3.7 md) or interbar facies (6.2%, 2.1 md). In addition, wells with a thick central bar facies appear to maintain higher reservoir pressures. Recognition of the facies, and understanding their distribution and interrelations are prerequisites to developing a program which will maximize oil recovery from the field.

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Independent Geologists—Endangered Species

During the last 5 years, while constantly complaining about a supposed lack of competition in the extractive industries, the U.S. Congress and administrative regulatory agencies have focused their power to make this