thickens to the southeast, although not as much as expected. The average thickness in the Valley and Ridge province is about 17,000 feet and the greatest thicknesses are in the southern part, indicating that the basement surface plunges in that direction.

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Summary of Geology of Atlantic Coastal Plain Province

The emerged part of the Atlantic Coastal Plain is underlain chiefly by Cretaceous and Tertiary sediments above the basement rocks. Some deep beds may be of Jurassic age, and thin deposits of Quaternary age blanket coastal areas. In aggregate, the sediments thicken as a wedge toward the coast; at extreme tips of southern New Jersey and eastern North Carolina they are about 10,000 feet thick, and in southern Florida they are thicker than 15,000 feet.

Predominantly marine sands and clays characterize the entire sedimentary sequence north of North Carolina, as well as the Cretaceous sequence north of Florida. Near-surface calcareous rocks of Eocene age extend from North Carolina through Florida. Pre-Pleistocene rocks of Florida are largely carbonates.

The basement underlying the eastward- and southeastward-dipping homoclinal beds consists chiefly of crystalline rocks and to a lesser extent Paleozoic and Triassic sedimentary rocks. The basement is a shallow platform beneath the updip portion of the Coastal Plain, but in southern New Jersey and eastern North Carolina the slope steepens where the platform adjoins the western border of a north-trending trough. The Peninsular arch of Florida and the Cape Fear arch of North Carolina are two northwest-trending positive elements. An embayment in southeastern Georgia lies between them.

Common tendencies include: (1) downdip change in many formations from coarse clastic to fine clastic to carbonate facies, (2) downdip thickening of beds, (3) downdip increase in number of beds, (4) lack of consolidation of sand and clay except at great depth, and (5) decreasing porosity and permeability with depth in coastal areas.

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Deep Drilling Project

The AMSOC Committee of the National Academy of Sciences-National Research Council has determined that it is both feasible and desirable to drill a hole through the earth's crust for the main purpose of obtaining as much sample as possible of the mantle. The hole must be drilled in either the Pacific or Atlantic Ocean basin where the crust is thin enough to be penetrated. Detailed surveys have been carried out in the area north of San Juan, Puerto Rico, on the rise north of the Puerto Rican trench. The survey area covers about 5 square degrees. In the Pacific a smaller area 50 miles southwest of Guadalupe Island has been surveyed. One of these sites will be chosen for drilling to the mantle. The project will be carried out in 3 phases: Phase I will consist of modifying a drilling barge for deep-water operation. As many test holes as the project can afford will be drilled. Several complete sedimentary core sections will be obtained which will yield information on coring methods in unconsolidated sediments, as well as paleontological, mineralogical, and structural knowledge of deep-sea sediments, which never before has been obtained. The preliminary holes will go to depths of 18,000 feet and in some places it is expected that the second layer will be penetrated. Phase II will begin with the application of the engineering data found in phase I to the design of a new drilling barge. The new barge will be constructed and moved into place. Phase III encompasses the actual drilling of the deep mantle hole, the scientific direction of the work, field analysis of the results, and later laboratory analysis.

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Lower Silurian and Cambro-Ordovician Sedimentation of Northern Appalachian Basin

Subsurface studies in the Northern Appalachian basin reveal several different histories of sedimentation (Cambro-Ordovician and Lower Silurian). Too few wells have been drilled to the Precambrian to reveal anything but very regional data on the Cambrian sediments. The Cambrian thickness varies from 13,000 feet on the outcrop in south-central Pennsylvania to 900 feet in northeastern Ohio and 0 feet in southwestern Ontario. The section is predominantly dolomite and sandstone. The Upper Cambrian isopach map shows a probable regional high in northeastern Ohio. This high seems to trend north-south. Two regional unconformities have been detected within this section.

Middle-Ordovician sedimentation marked a time of emergence with the Adirondack-Tazwell axis in the center of the basin forming a structural and facies barrier separating for the first time the Appalachian basin into two distinct basins of deposition. On the northwest flank of the Allegheny synclinorium, the Crawford arch came into existence along with the Olean embayment and Erie trough (Chatham Sag extension). Unlike the more pronounced Adirondack-Tazwell feature, the Crawford arch did not act as a facies barrier. The Middle Ordovician sediments encountered so far are argillaceous limestones. The exception to this being the dolomitized productive areas on the Findlay arch.

Upper Ordovician sedimentation shows regional east to west thinning with occasional interruptions across local highs. These sediments are predominantly shales with occasional layers of siltstones or sands. The subsequent Lower Silurian deposits also show regional thinning eastward with local variations. Lower Silurian production appears to be confined to within the 200–400-foot isopach interval. Variations within this isopach interval are critical as to the quality of production to be found. Detailed study reveals the productive sand bodies are deltaic rather than offshore bars or shoestring sands.

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Petroleum Possibilities of Peten Basin, Guatemala

The Peten area of Guatemala was intermittently occupied by a marine basin from the late Paleozoic through the Cenozoic. The oldest sediments in the basin probably represent deep-water deposition in Pennsylvanian time. Emergence of the area, in the Permian resulted in the deposition of limestones, dolomites, sandstones, and siltstones. Total emergence by the end of the Permian continued through the Triassic and most of Jurassic. Upper Jurassic encroachment