

comes an individual artificial reef and as such attracts tremendous numbers of marine life. Over 2,800 of these artificial reefs now stand in Louisiana waters, placed there by oil companies. These have caused a changing ecology in the Gulf of Mexico that has produced a fantastic accumulation of fish life. People connected with the sea, which include opposition in other areas, have received the associated rewards.

Colored slides and movies taken during scuba dives are presented that show how flora and fauna collect on progressively older platforms and how they attract fish life.

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\*Sohio Petroleum Company, Oklahoma City, Oklahoma

### REVIEW OF NEW CONCEPTS BASED ON INFORMATION FROM JOIDES

(Joint Oceanographic Institutes,  
Deep Earth Sampling)

THOMAS L. THOMPSON\*  
January, 1971

Drilling and coring by JOIDES consists of over 150 stations in the world oceans including coring beneath water depths in excess of 20,000 feet, sub-bottom penetration of over 3,000 feet, and re-entry of the drill hole beneath 13,000 feet of water. Oil was discovered beneath 11,700 feet of water in the Gulf of Mexico and other cores have supplied supporting evidence for concepts of sea floor spreading, and plate tectonics as derived from bathymetry, geomagnetism, earthquake seismology and tectonic events recorded by the rocks on land.

Evidence is accumulating that the ocean basins are geologically young (less than 200 million years); that new oceanic lithosphere forms along crests of oceanic ridges; that older oceanic lithosphere is resorbed beneath linear trends of deep focus earthquakes associated with oceanic trenches; that extensive plates of the earth's lithosphere move laterally at rates up to several inches per year; that these plates interact to cause deformation, mountain building, and unconformities; and although the areal extent of continental ma-

terial may be increasing on balance, the distribution of land and sea may be a passive and ephemeral consequence of interactions between adjacent plates of lithosphere.

The practical consequences of these concepts may lie in the potential for reconstruction of land-sea relationships of the past and thereby the distribution of sediment along continental margins of the past and present; the potential for predicting structural style resulting from plate divergence, convergence and oblique interaction; and the effects of abnormal temperature in the generation of petroleum.

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### STRUCTURAL GEOLOGY OF THE OUACHITA MOUNTAINS

GEORGE W. VIELE\*  
April 26, 1971

Nappes form the structural framework of the Ouachita Mountains. Fabric studies and recent mapping reveal three structural sub-provinces; a southern nappe largely in Ordovician shales; a northern nappe composed of Ordovician through Devonian strata; and an outer belt of orogenic tectonic and thrust faults in Carboniferous strata.

The southern nappe is broadly arched. Near Benton, Arkansas, on its thoroughly cleaved upper limb, axial surfaces of digitate isoclinal folds dip gently southward. Northeastward, across the axial surface of the nappe, sole marks, cross laminae, and graded beds indicate an overturned lower limb. All planar structures, bedding, cleavage, and axial planes, are flat-lying, although steepening northeast dips develop progressively northeastward. Still farther northeastward the axial surface of the nappe is recrossed, for the stratigraphic succession indicates a digitate upper limb.

A slide marks the lower limb of the northern nappe. From southwest to northeast it comprises an overturned lower limb, an axial zone, a strongly digitate upper limb, and, near Little Rock, a second slide. All structural elements dip northeastward. Southwest of this second slide, homogeneous macroscopic folding deformed the thoroughly cleaved lower Paleozoic strata. Northeast of the slide, however, orogenic landsliding of Carboniferous

rock off the nose of the northeastward-diving nappe formed a broad belt of chaotic deformation including antiformal and synformal overfolds. The plunging action of the gravity slides drove the thrust faults marking the northern edge of the Ouachita Mountains.

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**NEW DEVELOPMENTS OF SECOND  
WILCOX RESERVOIR IN  
OLD GIANT FIELDS OF  
SEMINOLE COUNTY, OKLAHOMA**  
JACQUE W. VINCENT\*  
April 12, 1971

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\*Keener Oil Company, Tulsa, Oklahoma

**GEOLOGY OF THE  
ARCTIC ISLANDS**  
JOHN WONCIK\*  
March 1, 1971

The Arctic Islands of northern Canada is the area of the Sverdrup Basin. This basin, which is north of the Arctic Circle, covers

approximately 350,000 square miles and contains 800,000 cubic miles of sediments. Large anticlines up to 20 miles long and five miles wide are being drilled and gas is being found. Oil seeps are present on Melville Island. Sediments from Ordovician through the Tertiary are present. The Paleozoic is characterized by carbonates and is exposed in the Perry Island Fold Belt. The center of the Sverdrup Basin is characterized by thick Mesozoic sediments consisting of sands and shales. These sediments quite often are penetrated by diapirs of gypsum. The host gypsum is believed to be Permo-Penn in age.

The first well to be drilled in the Arctic Islands was in 1962 by Dome Petroleum to a depth of 12,543 feet. As of February, 1971, only ten wells have been drilled in this vast remote area. Two wells encountered gas causing blowouts lasting several months during 1970. Both wells, one on Melville Island and the other on King Christian Island, encountered gas in the Triassic. These two wells, as well as three others, were drilled by Panartic. Several other wells are to be drilled soon and major gas and oil fields are likely to be developed in this area.

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