SILURIAN CHITINOZOANS FROM FLORIDA WELL SAMPLES

Chitinozoans of Silurian age were recovered from four wells in Florida: Cone No. 1, Tillis No. 1, Hilliard No. 1, and Kie Vining No. 1. An attempt was made to establish a correlation between the four wells using the chitinozoan evidence, and the results are presented. The youngest assemblage probably is of Ludlovian age; the oldest is of late Llandoverian age.

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SOUTHWEST LAKE ARTHUR FIELD, CAMERON PARISH, LOUISIANA

Southwest Lake Arthur field is a classic example of one of the rare, non-salt-associated stratigraphic traps found in southwest Louisiana by geologic-geophysical exploration techniques. The stratigraphic trap is constituted by an E-W-trending sandstone barrier bar and a tabular shaped marine sandstone that grades laterally into shale toward the north, west, and south. The sandstone deposits are superimposed on a present day southeast-dipping homocline.

Integration and review of the geology and geophysics of this documented stratigraphic trap were undertaken to determine whether the *Planulina* no. 2 Sand pinchout could be observed visually on the available conventional split-spread reflection seismic-record section and if essential criteria could be developed to locate similar fields.

The procedure employed was: (1) a thorough geologic study was made from logs, cores, and production data of numerous wells in and around the field from which structure and isopach maps were made of the reservoirs constituting the stratigraphic trap; (2) the original field records were transcribed onto magnetic tape and then to a processed seismic-record section; (3) a synthetic seismogram was constructed from a sonic log of a well near the seismic line along with the spontaneous-potential and resistivity curves of the same well plus another well along the section; (4) the digitized spontaneous-potential and resistivity curves for these wells were converted to a time scale using the values of time depth derived from the integrated sonic log; and (5) the synthetic seismogram and digitized logs were superimposed and compared with the record section. A change of character was observed which showed thickening of the section approximately equal to the developed sandstone. Because conventional seismic recordings in the area are generally plagued with various noise problems, this change of character may be coincidental. Additional work is needed to confirm such a liberal interpretation.

Production is from the *Planulina* no. 2 Sand in the Erath member of the Anahuac Formation. This member coincides with the *Planulina palmerae* biostratigraphic zone which is early Miocene.

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GEOTHERMAL GRADIENTS IN FLORIDA AND SOUTHERN GEORGIA

Bottom-hole temperatures from electric-log surveys were collected from all nonconfidential oil tests that recorded temperature data. These data are from 287 wells in Florida and 33 in Georgia. Computed gradients were compiled into county averages, and a preliminary geothermal gradient map was drawn.

Peninsular Florida, south of a NE-SW-trending zone through Taylor and Nassau Counties, is characterized by gradients generally less than 1.0°F/100 ft. Northern Florida and southern Georgia are characterized by gradients that generally exceed 1.0°F/100 ft. A weak and questionable increase in gradient may occur over the Sunniland field in southwest Florida.

The observed NE-SW geothermal trend parallels the Appalachian Mountain belt and coincides with known magnetic and gravity features of the area. It also parallels the Cretaceous to Holocene clastic-nonclastic boundary in northern Florida.

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PHOTOGEOLOGIC APPLICATIONS IN GULF COAST

Much photogeologic interpretation depends upon late structural movement at the surface, either by rejuvenation or compaction around older structures. The Gulf Coast is one of the more active provinces from the standpoint of tectonism and compaction.

Actually, far more surface structure is mappable at the surface than many Gulf Coast geologists realize. By using special modern photography, and some of the more detailed geomorphic procedures that have been developed, much structural information can be obtained.

Detailed study of the air photos of the entire state of Louisiana, the Gulf coastal part of Mississippi and Alabama, and large parts of the Texas Gulf Coast have resulted in some interesting conclusions:

1. Far less distortion than can be measured with usual well control, or shallow seismic interpretation, is needed to create surface structural indications with the more sensitive geomorphic criteria.

2. A large percentage of the structural oil fields have recognizable surface features.

3. Some surface expressions associated with up- and down-to-coast faulting are not as expected from subsurface studies.

4. Geomorphically, an expression of the deeper causative structure commonly lies directly above on the surface, even in grabens and on the downthrown side of normal faults.

5. Special photography and more detailed and experienced interpretative effort are needed on the Gulf Coast.

6. Because the surface has been neglected by many explorationists, and because of the importance of inter-well control to prospecting, detailed photogeologic interpretation is an economical way to develop many prospect leads. Through better localization it substantially reduces seismic costs.

Subsurface-surface relations, and many air photo examples depicting the surface expression of pertinent oil fields and prospects, from both the Jurassic trend and the down-dip Gulf Coast, document the conclusions.

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RELICT NATURE OF SEDIMENTS AND SUBMARINE TOPOGRAPHY OFF ALLIGATOR HARBOR, FLORIDA

An offshore area south of Alligator Harbor, Florida, contains several linear offshore shoals separated by relatively flat-floored "valleys." Eighty-six samples from