

Abstract:

Some Regional Concepts Applicable to Gulf Coast Geology,<sup>1</sup>  
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The model of depositional topography described by John Rich and DeWitt Van Sicken is one of the most useful concepts in petroleum geology. Continental shelves, and similar features in lesser seas, have existed throughout geologic time, but differed in many ways from the present continental shelf. Depositional topography of a particular time and place was determined by: 1) pre-existing marine topography; 2) kind and amount of material supplied to the sea; 3) marine mechanism for sediment distribution; 4) rate of regional subsidence or uplift and local tectonism within the marine environment.

Traditional stratigraphic concepts of depositional cycles and transgressive and regressive deposits were described from the North American interior stable region. Many of the resulting ideas do not fit conditions in persistently negative areas at the borders of the continent. Many inferences drawn from studies of the present continental shelf also have limited applicability to pre-glacial and pre-Laramide depositional conditions.

Detailed stratigraphic relationships disclosed by studies of distinctive deposits in shallow seas can be applied by analogy to interpret the Mesozoic and Cenozoic history of the Gulf Coast Region. Here stratigraphic sequences are more monotonous, and drilling has been largely confined to the shelf environments; the analogy should be revealing in spite of the uncertainties involved. During Triassic or Permian time the continental shelf extended gulfward beyond the present shelf, probably to the Sigsbee scarp. By Smackover (Jurassic) time it had retreated about to the Arkansas line. During Cretaceous and Cenozoic the front of the shelf advanced progressively gulfward at various rates.

Regional facies patterns are intelligible only in relation to the depositional topography. The "Shelf-break" is almost as significant as the strand-line in delimiting prospective oil and gas areas. Geophysical interpretation must take the depositional topography into account for validity in many areas.

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