time of lower sea stand 12,000 to 14,000 years b.p. Because of higher rates of eustatic sea level rise in the early Holocene and possible subsidence of the main part of the geosyncline, it is possible that greater thicknesses of Holocene coastal sediments may be deposited in the middle and outer continental shelf. On the inner shelf and present coastal area, the upper portions of the Holocene sediments tend to be destroyed by erosion at the shoreface and move to new depositional loci within the transgressing system. An understanding of the lateral and vertical facies relationships as compared with time-depositional planes within this transgressive sequence of coastal stratigraphic units is critical in the formation of modern analogs for interpretation of ancient coastal systems. This study also demonstrates that rates and especially volumes of sediment eroded in the shoreface may play a major role in the economics of human occupation of the coastal zone.

KRONEY, R. H., Johnson and Swanson, Dallas, TX

Selected Common Estate Planning Problems for Oil and Gas Investor in 1983 with Suggested Solutions

No abstract.

KRYSTINIK, LEE F., Reservoirs, Inc., Denver, CO

Turbidite Fans in Upper Cretaceous Pierre Shale, Eagle Basin, Colorado: A New Reservoir Facies

Turbidites have been recognized increasingly in the Cretaceous Interior seaway. Most are described as thin, economically unimportant sandstone beds isolated in prodelta mudstone. This study documents the occurrence of southerly prograding, sand-dominated turbidite fans of sufficient size to be considered economically viable hydrocarbon reservoirs.

Two fans intercalate with the Upper Cretaceous Pierre Shale and form cliffs over more than 10 mi (16 km) of continuous outcrop in the Eagle basin, north of Walcott, Colorado. Both units exhibit progradational sequences typical of turbidite fans. A common vertical succession of sedimentary structures consists of starved ripples, flat-bottomed ripple beds, thin flat beds grading into ripples of climbing ripples, and amalgamated flat beds. Massive to graded beds are rare and occur only in the upper part of each sandstone body. Associated sedimentary features include parting lineation, grooves, prod marks, mud chips, contorted bedding, and flute casts. Broad, low-relief channels occur at the top of the lower, more well-developed sequence.

The sedimentary structures described correlate well with accepted models for turbidite-fan sedimentation. The upward-thickening and coarsening character of the sandstone bodies, the abundance of incomplete Bouma sequences, and the presence of broad low-relief channels are typical of the outer-fan lithofacies associations of E. Mutti and F. Ricci-Lucchi.

Alternative interpretations of these laterally continuous, progradational sandstone bodies might include deposition in a distal shoreface or offshore bar environment. Hummocky cross-stratification and large-scale cross-stratified bed forms are not common in the sequence, as would be expected in a shoreface or marine-bar environment.

Turbidite-fan deposits similar to those studied could be economically significant because of their extreme lateral continuity, updip seals, intercalation with hydrocarbon source rock, and possible overpressuring. In addition, the apparently "distal" nature of these sandstone bodies suggests the possibility of thicker, better developed turbiditic sandstone bodies to the north. The presence of submarine fans within the Cretaceous Western Interior seaway may increase significantly the hydrocarbon potential of previously unexplored, "shaly" portions of the basin.

KURESHY, A. A., Staten Island, NY

Foraminiferal Stratigraphy of Ranikot (Paleocene) of Pakistan

The sedimentary deposits of Pakistan are divided into three distinct basins: the Lower Indus basin, the Upper Indus basin, and the Baluchistan basin. The Lower Indus basin is further divided into two parts; the northern part is the Sulaiman Province, and the southern part is known as Kirthar Province. The tertiary stratigraphy of Kirthar Province is conspicuous for its characteristic lithostratigraphic units. The Paleocene deposits of Kirthar Province are designated as Ranikot Group. The Ranikot Group was divided by Cheema et al in 1977 into three distinct lithostratigraphic units: the Khadro formation (Cardita beaumonti beds), Bara formation (Lower Ranikot), and Lakhra formation (Upper Ranikot).

The Khadro and Lakhra formations are marine, characterized by foraminiferal assemblages. The characteristic planktonic forms are: *Globigerina triloculinoides* Plummer, *Globorotalia pseudobulloides* (Plummer), *G. compressa* (Plummer), *G. velascoensis* (Cushman), and *G. pseudomenardii* Bolli. The diagnostic forms of larger foraminifera are: *Nummulites nuttalli* Davies, *Miscellanea* (d'Archiac & Haime), *Kathina major* Smout, and *Lockhartia conditii* (Nuttall). The planktonic foraminifera were assigned to *Globorotalia trinidadensis, G. pseudomenardii*, and *G. velascoensis* zones of Kureshy in 1977, and larger foraminifera were assigned to *Nummulities nuttalli* zones of Kureshy in 1978. The Bara formation is nonmarine and devoid of foraminifera fauna. On the basis of the larger foraminifera, Lakhra Formation is correlated to the 1927 "Ta" Letter Stage Classification of East Indies of Van der Vlerk and Umbrogrove.

KUYKENDALL, MICHAEL D., Oklahoma State Univ., Stillwater, OK

Correlation of Wireline Logs with a Shaly Sandstone Sequence, Red Fork Sandstone, Payne County, Oklahoma

The optimal use of well logs is to measure properties of rocks in a manner that permits valid and reliable inferences about rock type, porosity, permeability, fluid content, and related characteristics. The success of such an endeavor must be evaluated in terms of the known or fully determinable properties of the rocks that have been logged. Reservoir rocks whose actual physical properties differ significantly from those inferred from wireline logs are common.

At some localities in north-central Oklahoma, logs of Red Fork Sandstone (Desmoinesian, Middle Pennsylvanian) show suppressed spontaceous-potential curves, incomplete bed definition, misleadingly low resistivity, and no consistent, direct quantitative correlation between porosity and permeability. Foot-by-foot evaluation of an enigmatical core of the Red Fork by thin-section analysis, scanning-electron microscopy, and X-ray diffraction explained peculiarities in the gamma-ray and spontaneous-potential curves, and contributed to explanation of uncommonly low resistivity. Diagenetic effects and primary and authigenic clay seem to have had strong effects on log signatures. A large proportion of porosity is secondary.

LAGOE, MARTIN B., ARCO Oil and Gas Co., Dallas, TX,