Paleobiogeography, here exemplified by trilobite distribution, may make an important contribution to delimiting potential areas for profitable exploration.

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STRUCTURAL GEOLOGY AND TECTONIC DEVELOPMENT OF NORTHEAST PART OF RIO PUERCO FAULT ZONE, SANDOVAL COUNTY, NEW MEXICO

The northeast part of the Rio Puerco fault zone is in the southwestern part of Sandoval County, New Mexico. Three major types of structural features are present within the area: north- to northwest-trending folds; northeast-trending faults of the Rio Puerco fault zone; and north-trending faults. Dominant movement along faults within the area is dip-slip.

Two major periods of deformation are evident, the Laramide orogenic movements of late Paleocene through Eocene age, and Basin and Range tectonism of middle Miocene to recent age. Laramide tectonism resulted from a north-trending right-shift force couple related to the northeast drift of the Colorado Plateau, and to vertical forces which led to the development of the Nacimiento uplift. The northwest-trending folds and the northeast-trending normal faults of the Rio Puerco fault zone formed in response to the right-shift force couple. The Rio Puerco faults are interpreted as tension fractures which developed at 45° to the trend of the force couple. A slight clockwise rotation of the southeast part of the Colorado Plateau is evident from tension fracture trends along the fault zone. Miocene tectonic activity was dominated by north-trending, east-dipping normal faults having large stratigraphic separations that were related to the development of the Rio Grand rift. Many of the southeast-dipping normal faults of the Laramide Rio Puerco fault zone were rejuvenated during the Miocene crustal extension.

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PENNSYLVANIAN STRATIGRAPHY AND TECTONISM ON SOUTHEASTERN SHELF OF PARADOX BASIN

Precambrian faulting juxtaposed resistant and nonresistant rocks to form an erosional highland around which lower Paleozoic sediments were deposited. Pennsylvanian faulting along the trends of the ancient faults affected the extent of Early Pennsylvanian karsting and the thickness and distribution of succeeding marine deposits. Fault movement ceased in the Desmoinesian.

Clastic and carbonate sedimentation in the area is cyclic. The cycles were produced by shifting centers of detrital sedimentation superimposed upon sedimentation patterns caused by eustatic sea-level changes.

The depositional environments recognized in the area include distributary channels with their associated distributary-front and overbank-detrital environments, and very shallow-water, open-marine carbonate environments.

The detrital distributary systems in the study area produced fan-delta deposits.

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MODERN ANALOGS OF GREEN RIVER FORMATION

No abstract available.

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MUDDY SANDSTONE ENVIRONMENTS, POWDER RIVER BASIN, WYOMING AND MONTANA: OUTCROP AND CORE STUDY

In the Powder River basin of Wyoming and Montana deltaic lobes have prograded from the east, northeast, and southwest at various times during the interval of time assigned to the Muddy Formation. Several recognizable sand-body types which yield hydrocarbons are associated with each of these deltas.

The major types of reservoir sands are delta-distributary channels, barrier islands and high sand tidal-flat deposits. Each of these environments of deposition can be recognized in outcrop and in slabbed cores. After the environment is identified in a core, log shape is useful to extend the environment laterally.

Examples from outcrops and cores from Wyoming and Montana illustrate the features which allow recognition of sands deposited in the various environments. In the barrier-island sands, such as those at Bell Creek field, low-angle crossbedding and a general coarsening upward from shale to silty sand to sandstone is present. *Thalassinoides* and a few *Ophiomorpha* burrows are locally present.

In the tidal-flat sandstones wave and current ripples predominate. Long vertical burrows designated as *Skolithos* are prominent and brackish deposits such as coal are locally interbedded. *Corophium*, a small U-shaped burrow, is present in some of the cleaner intertidal sand bodies.

Distributary-channel sandstones are typically medium to large scale trough crossbedded and locally have current ripples, climbing ripples, and interbedded clay drape in natural-levee deposits. Burrowing usually is limited to the upper part of the distributary-channel sands. Locally at the base of the channels is a conglomerate made up of clasts of marine shale. The uppermost part of the distributary-channel sands commonly are reworked and spread laterally as a thin transgressive beach or intertidal sand.

A subregional paleogeographic reconstruction can be made utilizing the probable areal distribution and trends of each of the genetic sand limits. Maps of this type aid significantly in improving the success ratio of both exploration and development drilling.

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PALEOCURRENT ANALYSIS OF EARLY TRIASSIC MOENKOPI FORMATION, UINTA MOUNTAINS AREA, NORTHEASTERN UTAH

Paleocurrent measurements of 175 linear asymmetrical ripple marks were taken at seven sections of the Moenkopi Formation in northeastern Utah. Five of