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MISSISSIPPIAN GEOLOGY OF CANADA AND WILLISTON BASIN

(No abstract submitted)

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MISSISSIPPIAN AND PENNSYLVANIAN STRATIGRAPHY IN MIDDLE AND SOUTHERN ROCKY MOUNTAINS*

Kinderhook and Osage rocks record a marine advance from the northwest. The sea covered only part of Wyoming in Kinderhook time, but inundated nearly all of the region in Osage time. In Meramec time it retreated. Earlier deposited Mississippian rocks were widely eroded in late Meramec and early Chester times when the region was emergent. In the late Chester another advancing sea flooded a mature topography in Wyoming developed on the Madison Limestone.

Most Mississippian rocks in the region are carbonate, but traces of anhydrite in rocks of Meramec age in Wyoming suggest that evaporitic strata equivalent to the Charles Formation once were widespread. Sandstone and shale are present in the Humbug Formation (Meramec) and in the lower part (Chester) of the Manning Canyon Shale in northeastern Utah.

Pennsylvanian rocks display marked local diversity of extent, thickness, and lithology which contrasts with the high degree of lithologic homogeneity in Mississippian rocks. By Early Pennsylvanian time the marine waters which began their advance in the Chester covered most of Wyoming, but much of Colorado and eastern Utah was still emergent. In Des Moines time maximum marine transgression and maximum elevation of the Ancestral Rocky Mountains took place. Evaporites were deposited in basins adjacent to the mountains while coarse red clastic rocks accumulated near shorelines. On the Wyoming shelf widespread well-sorted Tensleep sands were deposited.

In Late Pennsylvanian time regression and shoaling of the sea limited the extent of marine deposition, and tectonic activity diminished.

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MIDDLE DEVONIAN FACIES RELATIONS, ZAMA AREA—ALBERTA, CANADA

(No abstract submitted)

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BANK-TO-BASIN TRANSITION IN PERMIAN (LEONARDIAN) CARBONATES, GUADALUPE MOUNTAINS, TEXAS

Light-colored, parallel-stratified, nonreef marine limestone and dolomite (Victorio Peak Formation) grade abruptly southeastward into dark cherty limestone (Bone Spring) along the northwestern margin of the Delaware basin (King, 1948). Study of the well-exposed transition zone in the Guadalupe Mountains suggests the presence of three major contemporaneous environments along a gentle basinward slope: bank; bank margin (½-1 mi wide), both Victorio Peak; and euxinic basin, Bone Spring. Basinward regression of transition facies was 2–3 mi during accumulation of 1,500 ft of section. Middle Permian erosion truncated the transition strata creating basin-sloping unconformities on which limestone, megabraccia, and sandstone (Cutoff and Brushy Canyon Formations) were deposited.

Principal lithologic facies of the transition zone are successively: lime grainstone and dolomite packstone (bank); dolomite wackestone and mudstone (bank margin); and lime mudstone (basin). Paucity of dessication or solution features, algal laminates, oölites, and coated or composite grains suggests prevalence of subtidal bank environments. Allochthonous channel-fills and sheet deposits of skeletal packstone and wackestone occur in bank margin and basin-edge facies. Sand-size skeletal grains and carbonate silt are dominant constituents in bank and bank margin rocks. Carbonate silt predominates in basin facies. Characteristics of bank relative to basin strata are: lighter colors; dominance of grain-supported rocks; coarser grain size; normal-marine fauna; more dolomitization; less chert, but larger, more rounded nodules; and thicker, more massive beds. Undulatory bedding and disturbed laminations characterize many basin strata adjacent to the bank margin.

Two major controls on sedimentation and subsequent diagenesis were diminished turbulence with depth, and an abrupt change along the depositional slope from normal-marine to euxinic water at inferred depths of a few hundred feet. Bank proximity and finer particle size favored dolomitization. Low permeability of organic-rich basin facies apparently inhibited downdip dolomitization. Cementation obliterated most depositional porosity.

ROBERT MCDONALD

TERTIARY WASATCH-GREEN RIVER FORMATIONS OF WESTERN WYOMING, UTAH, AND WESTERN COLORADO—OIL AND GAS

(No abstract submitted)

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COMPUTER AS AID TO GEOLOGIC COMMUNICATION

Machine-oriented information retrieval systems are becoming more widely appreciated in the scientific world. Having an awareness of a large percentage of a total literature provides a fund of information not previously obtainable. The volume of geologic literature, and the number of publications in allied fields with which explorationists must have an acquaintance, are of such dimension that computer processing is the only hope of remaining alert to all that is available.

A similar awareness of even greater significance to the geologist is the perception he must have to recognize that clue of exploration value within his data. Extensive and diverse computer retrievals and selected combinations of data can uncover associations and suggest new leads that were not previously apparent.

Encoding data to machine processing demands a definition and a consistency that requires a clear understanding of the project objective. Computer-sensibility checks will provide reliability and repeatability throughout an accumulation of facts, yet they also can accent variability in collection and point up anomalies in data gathering. The logic required in developing a computer program requires the anticipation of the unusual, and the geologist must know his subject in order to anticipate their existence or interpret their presence.