overlies, and intertongues with the marine Lewis Shale, and is overlain by, and intertongues with the nonmarine Lance Formation.

Exposed Fox Hills strata consist of littoral and shallow neritic, very fine-grained sandstone and siltstone which commonly are overlain, with marked disconformity, by fine- to medium-grained sandstone deposited in estuarine environments. The origin of these widespread erosion surfaces is believed to be related to the lateral migration of estuary and tidal channels behind prograding barrier-island shorelines.

In the subsurface east of the outcrop, the stratigraphic position of the Fox Hills rises, in an east to southeast direction, over 400 ft in a distance of 15 mi. Subsurface shoreline trends in this area are north to northeast, and appear to form a large embayment across the present Wamsutter arch. North and east of this area, in the vicinity of the North Desert Springs field, the typical Fox Hills Sandstone and uppermost Lewis Shale pass laterally into a thick sequence of siltstone and shale interpreted by Asquith to be a major delta.

Small amounts of oil and gas have been produced from the Fox Hills, and numerous shows have been reported from wells on the east flank of the Rock Springs uplift. The optimum targets for future exploration appear to be porous Fox Hills shoreline and estuarine sandstones, where they interfinger in an up-dip direction with shales of the Lance Formation.

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(No abstract submitted)

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STRATIGRAPHY OF FRONTIER SANDSTONE MEMBER OF MANCOS SHALE (UPPER CRETACEOUS) ON SOUTH FLANK OF EASTERN UINTA MOUNTAINS

(No abstract submitted)

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DEPOSITIONAL PATTERNS IN MIDDLE PERMIAN STRATA OF CENTRAL WESTERN UNITED STATES

Sedimentary strata of Middle Permian age (Guadalupian—uppermost Leonardian?) in the central western United States (Montana-North Dakota to Arizona–West Texas) contain a variety of rock types, including carbonates, evaporites, and terrigenous clastics. These strata include such group or formational units as Phosphoria, Park City, Goose Egg (Wyoming); Taloga, Whitehorse, Blaine (Kansas, Oklahoma); Artesia, San Andres (West Texas, New Mexico); and Kaibab (Arizona). These sediments were deposited on a broad cratonic shelf which underwent differential subsidence and which was bounded by a continental upland on the east and by deep-water seas on the west and south. Lithologic patterns within the strata are characterized by profound lateral facies changes and cyclical repetitions in vertical sequence. Lateral lithofacies changes are related to a broad range of depositional environments and processes, many of which may be identified. These lithofacies changes control the accumulation of major quantities of oil and gas. Cyclic repetitions of lithology in vertical sequences of the strata are related to periods of transgression and regression produced by changes in sediment productivity and sea level. These changes may have been controlled by both global tectonic instability and polar glaciation. Regional correlations based on the cyclicity of the strata seem reasonable and suggest that several of the major depositional cycles identified in widely scattered parts of the central western United States may be synchronous.

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INFLUENCE OF PORE GEOMETRY ON WATER-OIL RELATIVE PERMEABILITY

The interrelation of pore geometry, rock properties, and water-oil relative permeability is illustrated with photomicrographs and relative permeability curves of reservoir rocks. Data are shown to be very similar within a given rock type. This fact emphasizes the need to determine the various reservoir rock types and their distribution. Effects of core handling, calculated versus observed waterflood performance, and data-collecting procedures are important factors to consider.

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FUTURE EXPLORATION IN ROCKY MOUNTAINS

(No abstract submitted)

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LOWER TRIASSIC MARINE FACIES: AN INDEX TO TECTONIC TRANSPORT IN SOUTHEASTERN NEVADA

A detailed regional facies analysis of the lower part of the Moenkopi Formation (Triassic) is helpful in understanding Sevier tectonic transport along the shelf-miogeosyncline transition in southeastern Nevada. The Virgin Member represents deposition during the last pulse of marine transgression in the Cordilleran geosyncline from the basin onto the shelf in southeastern Nevada and adjacent Utah and Arizona. Because facies changes and corresponding thickness changes assume linear trends along the transition zone, the post-depositional translation and distortion of facies can be determined.

The stratigraphic section in an area comprising the North Muddy Mountains east to Lake Meade is an apparent autochthonous sequence which is not logically underlain by a regional thrust with scores of miles of displacement. The distance measured perpendicular to depositional strike from true shelf facies to the basinward margin of the transition facies is about 35 mi. Included within this span is a thick evaporite sequence that is equivalent to beds deposited in an open marine setting in the basin on the west. On the north, between the Beaver Dam and the Mormon Mountains, the span between the same 2 facies is about 10 mi. The apparent facies change on the north in the area of the Mormon Mountains is ascribed to a major sole thrust that has displaced facies about 20 mi toward the shelf. The areas are separated by an approximate east-west shear zone that has a minimum right-lateral displacement of about 12 mi.

I believe that attractive oil and gas possibilities exist in the North Muddy Mountains–Lake Meade area which was previously interpreted to be a major allochthon.