

## ASSOCIATION ROUND TABLE

**ROCKY MOUNTAIN SECTIONS**  
**AAPG-SEPM-EMD**  
**28TH ANNUAL MEETING**  
**Casper, Wyoming**  
**June 3-6, 1979**

**Theme: "Rocky Mountain High"**

*Field trips*—Sunday, June 3: Precambrian on Casper Mountain; Cretaceous stratigraphy of Casper; uranium mining in the southern Powder River basin including Highland (Exxon), 28-33 S. Monument Hill (Kerr-McGee), and Morton Ranch (United Nuclear). Thursday, June 7: coal mining in the Powder River basin at Rawhide (Exxon), Black Thunder (Atlantic-Richfield), and Belle Ayr (Amax).

*Core seminars*—Sunday, June 3: major oil and gas discoveries in Rocky Mountains.

*Social activities*—Ice breaker on Sunday evening, June 3, at the Ramada Inn. Cocktail party and barbecue followed by a dance and casino on Monday evening, June 4, at the Ramada Inn.

*Exhibits*—Over 40 technical and educational exhibits will be available for viewing from midday Sunday through midday Wednesday.

*Registration*—Ramada Inn, Sunday and Monday, June 3 and 4, 1979.

*Ladies activities*—Brunch, luncheon, art exhibit, and seminars for ladies only.

*For further information*—General, W. J. GUY, Union Oil Co. of California (307-234-1563); housing, R. J. VAN DYKE, Pacific Transmission Supply Co. (307-265-1027); registration, L. P. WORKS, Gulf Energy and Minerals Co. (307-235-1311); field trips, P. BRYANT, Marathon Oil Co. (307-235-2511).

### Abstracts of Papers

BEYER, L. A., U.S. Geol. Survey, Menlo Park, Calif.

Borehole Gravity Study of Density and Porosity of Selected Frontier, Tensleep, and Madison Reservoirs in Bighorn Basin, Wyoming

Borehole gravity surveys in the Gebo, Garland, and Big Polecat oil fields of Wyoming uniquely assess the density and porosity of the reservoir and associated rocks. The borehole gravity method is unique because (1) unlike other well-logging techniques, gravity measurements depend directly on rock bulk density; (2) the large radius (and volume) of investigation ensures that the measurements are unaffected by borehole fluids and by rugosity, casing, cement, or any area close to the borehole that may be modified by flushing or invasion by drilling fluids; and (3) the high precision of the measurements makes this method sensitive to very small variations in formation density (usually  $<0.005$  to  $0.04$  g/cc, depending on length of the borehole interval).

Interval density and porosity profiles determined from the Bighorn basin surveys were compared with

gamma-gamma density logs, neutron porosity logs, and density and porosity measurements of core samples. Discrepancies between the density and porosity methods arise because borehole gravity, owing to its large radius of investigation, measures an average porosity that includes the irregularly distributed component (e.g., vugular porosity of reservoir rocks in the Madison Limestone at Garland) which is less effectively evaluated by conventional shallow-penetration logs or core samples. Other discrepancies are usually due to the inherent limitations of one or several of the methods and are mostly dependent on the composition and coherence of the rocks.

Variations in the contribution of fracture porosity to total porosity in the Tensleep Sandstone reservoir at Gebo are masked by much larger fluctuations in intergranular porosity caused by differences in the cementation and abundance of dolomite. Whatever the cause, the magnitude of fracture porosity is probably below the threshold of detection with borehole gravity. High-porosity ( $>15\%$ ) and/or gas-filled sandstone units, principally in the Frontier Formation, were easily detected behind casing in the three oil fields. An abrupt and possibly widespread downward increase in porosity in the upper part of the Frontier Formation may (1) reflect lithologic and mineralogic variations owing to changes in the depositional environment, (2) be related to a previously proposed unconformity, and (3) have exploration significance.

BLACK, BRUCE A., Colorado Plateau Geol. Services, Inc., Farmington, N.M.

Oil and Gas Potential of Santa Fe Embayment, Santa Fe County, New Mexico

Exploration for oil and gas in the Tertiary grabens and basin of the Rio Grande rift system has been sporadic and noncommercial. Several factors may change this situation in the future, at least in basins such as the Santa Fe embayment of the Espanola basin. The confirmed presence of source rocks, adequate reservoirs, and a favorable maturity history in the Santa Fe embayment suggest that parts of this subbasin may ultimately prove to be productive.

Significant oil and gas shows have been reported in the four wildcat wells drilled to date. Oil-stained outcrops and numerous stratigraphic and structural anomalies appear to make the area an attractive exploration target. Jurassic and Cretaceous rocks are the primary objectives and a close look at the structural evolution of the basin may provide clues to exploration in the related rift basins both north and south of the area.

BOBERG, W. W., World Nuclear Co., Casper, Wyo.

Applied Exploration Geology and Uranium Resources of Great Divide Basin, Wyoming