5. E. N. DUNLAP, The California Company, Denver, Colorado
Drilling Production Techniques in the Uinta Basin

Normal Rocky Mountain operating procedures have been modified to conform with special conditions found in the non-marine Tertiary section. Hard abrasive rocks, fracturing, numerous hydrocarbon shows, intermediate gas and water sands, and high pour point oil have governed the choice of methods. Low penetration rates, extensive coring, and testing to adequately evaluate productivity and distinguish the contents of potentially productive zones result in high drilling costs. Recurring loss of circulation below the top of the Green River and desirability of maintaining low water loss of mud while coring and testing the lower Green River sands and siltstones have contributed to high drilling fluid costs. Penetration rate has been increased considerably by increasing drilling weight above 25,000 lbs. Loss of circulation has been reduced by maintaining mud weight at a practical minimum and pretreating with fine fibrous and granular material before drilling into the Green River. Usual completion practice is to cement 7″ casing through the pay zone, gun perforate, run tubing, and swab. Except for oil squeezing of sandstone and acidizing of calcite-lined fractures, stimulation methods have not been helpful so far. Increased productivity of one well resulted from setting pipe on top of the pay and coring with oil indicates that this procedure may be desirable where conditions permit.

Rods for rod pumps are equipped with paraffin scrapers and downhole hydraulic pumps are operated with heated power oil to prevent wax accumulation in the tubing. After the oil reaches the surface, it is kept fluid by heating until mixed with less viscous oil on its way to the refinery.

6. D. L. BLACKSTONE, Department of Geology, University of Wyoming, Laramie, Wyoming
Fault Patterns in Selected Rocky Mountain Fields

The position of individual folds or groups of folds within the regional structural pattern of the Wyoming foreland area is considered to be due to the response to stress of either: (1) fractures in the pre-Cambrian basement; or (2) heterogeneity of the basement complex. Deformation of the overlying rocks resulted from adjustment along one of these controls acting under tangential stress.

An integral part of the development of some folds is a localized fault system known as epi-anticlinal faulting. The epi-anticlinal fault systems have been attributed to tension in the rising anticline; or to locally applied tangential stresses comparable to the action of a plunger in the immediate vicinity of the fold. An analysis of the existing fault system in the Elk Basin and Pilot Butte folds has been made from data obtained by critical examination of electric logs. Reconstruction of the fault planes in space indicates that the idea of a tensional origin for the faults is only partially true; and that the local plunger action can not be demonstrated.

One portion of the fault system developed as slippage between strata, and followed fractures across the bedding to propagate upward toward the surface at higher angles. Other faults apparently originated as a pair of conjugate fractures, on either or both sets of which movement became appreciable. Some of the faults are due to adjustment in the hanging wall block of an earlier fracture.

The fault systems discussed appear to be limited to Mesozoic strata, and particularly the Upper Cretaceous rocks. Folds located in the Big Horn, Wind River and Powder River basins from which erosion has stripped the younger rocks overlying the central portion and exposed the Paleozoic rocks, have no epi-anticlinal fault systems. These folds may be bounded by a high angle reverse fault which parallels the steep limb of the fold.

7. WM. LEE STOKES, University of Utah, Salt Lake City, Utah
Salt-Generated Structures of the Colorado Plateau and Possible Analogies

Salt- and gypsum-bearing sediments exceeding 10,000 feet in thickness are known in the Jurassic of central Utah and in the Pennsylvanian of eastern Utah and western Colorado. Similar structures, both large and small scale, appear in association with deformed salt-bearing beds in the two areas.

Evidence seems to indicate that structural evolution of the two areas followed essentially similar lines: (1) gradual upthrust of elongate masses of plastic sediment perhaps under compressional forces or perhaps under purely geostatic pressure, (2) stagnation or cessation of upward movement allowing uniform sedimentation across sites of former acute deformation, (3) collapse by solution with subsequent erosion forming normal faults, synclinal grabens, graben valleys, and perhaps, with local oversteepening, actual "gravity thrusts."

Caution is suggested in interpreting strong local structures of the sort found in these areas as evidence for orogenic activity.

8. WILLIS FENWICK, Intermountain Exploration and Engineering Company, Casper, Wyoming
Stratigraphic Considerations Governing Gravity Interpretations in Utah

A practical interpretation of the gravity method of geophysical prospecting is outlined in terms of the geological aspects which might be anticipated in given prospective areas. Schematic geological structural occurrence and their influence upon the method are illustrated. Specific examples of results obtained in local areas of the Uinta basin and the Salt Valley areas of Utah and their possible geo-