is compared and contrasted with that of the Rocky Mountain region. It is noted that Pennsylvanian and Permian rocks occur extensively below Jurassic sediments in the Denver basin with progressive changes from the typical lithologies of eastern Kansas and southeastern Nebraska to the significantly different lithologies of eastern Wyoming and southwestern South Dakota. The pre-Pennsylvanian Paleozoic rocks, however, have not been traced to date through the Denver basin between the outcrop areas southeast and northwest of the basin, and there is evidence of a broad, northeast-southwest band through the basin where Pennsylvanian rocks rest on the pre-Cambrian. It appears that the Mississippian rests on progressively older pre-Mississippian sediments as this area is approached. The Paleozoic history of the Denver basin, as interpreted from available data, is presented.

6. JOHN C. MAHER, U. S. Geological Survey, Tulsa, Oklahoma, "Paleozoic History of Southeastern Colorado and Adjacent Areas."

The structural backbone of southeastern Colorado is formed by the Front Range, the Wet Mountains, and a buried ridge, the Apishapa-Sierra Grande uplift, which extends southeastward from the Wet Mountains. The Las Animas arch, of later origin, plunges off this buried ridge to the northeast. Parts of three major structural basins are present in the area—the Hugoton embayment of the Anadarko basin, the Denver basin, and the Raton basin.

Southeastern Colorado was first covered by Paleozoic seas in late Cambrian time, when coarse clastics (Lamotte sandstone) derived mainly from the north were deposited in front of a low landmass that extended from Union County, New Mexico, northwestward to the vicinity of Cañon City. The seas gradually encroached on this landmass, depositing additional upper Cambrian (Bonneterre dolomite) and lower Ordovician (Arbuckle group) rocks farther southwest. Near the close of early Ordovician time, gentle upwarping, possibly related to the development of the Transcontinental arch of Eardley, raised the central part of southeastern Colorado above sea-level. Seas of middle and late Ordovician age lapped upon the eastern and western slopes of this upwarping, depositing the sediments of the Simpson group and the Viola limestone. After the close of Ordovician time, uplifting, probably with some faulting, along the present trend of the Front Range, Wet Mountains, and Ahishapa-Sierra Grande uplift permitted the removal by erosion of most of the Cambrian and Ordovician rocks from that area.

In Mississippian time the seas advanced from the Anadarko basin, lapping on the gently sloping landmass. During Meramec time the seas probably completely covered the landmass and at the end of Meramec time began a withdrawal into the Anadarko basin. During Chester time the seas appear to have been restricted to the Hugoton embayment in the southeasternmost part of Colorado.

At the beginning of Pennsylvanian time, the Morrow seas advanced upon the flanks of the low landmass of eastern Colorado, bringing clastic material from the southeast. Near the end of Morrow time major uplifting with faulting elevated the Apishapa-Sierra Grande uplift, the Wet Mountains, and the Front Range, which supplied clastic material to transgressing seas during the remainder of Pennsylvanian time. A cross-flexure marking the earliest beginnings of the Las Animas arch seems to have occurred near the end of Missouri time. During early Permian time the seas gradually covered the Apishapa-Sierra Grande landmass, and during late Permian time the shore line remained fairly stable, until the seas receded at the close of the period.

7. JOHN R. FANSHAWE, consulting geologist, Billings, Montana, "Traps and Reservoirs in the Phosphoria and Tensleep Formations of the Big Horn Basin."

Phosphoria and Tensleep traps in the Big Horn basin are contrasted as to those controlled by strong artesian water flow, and others where subsurface water movement is at a minimum. Fresh waters cause changes in the nature of the entrapped petroleum as a result of lower temperatures and replenishment of oxygen at the oil-water interface. Closures protected from the regional direction of movement for artesian waters are less affected by these factors and contain crudes of abnormally high gravity, or gases with high concentrations of H_2S.

It is concluded that reservoirs modified least by mechanical and chemical effect of artesian waters are those which most closely approximate the original conditions of petroleum generation and entrapment. These reservoirs are in the deeper part of the basin, or in traps where pressure alone—rather than motion and pressure—holds the hydrocarbons and associated substances in place.

8. J. D. LOVE, U. S. Geological Survey, Laramie, Wyoming, "Periods of Folding and Faulting in Wyoming During Late Cretaceous and Tertiary Times."

Recognition of the timing of differential crustal movements in the Rocky Mountain region should lead to a clearer understanding of (a) the types of forces involved in Laramide and post-Laramide folding and faulting, (b) the possible times of accumulation of oil and gas in traps that may later have been modified, and (c) the reasons for the absence of oil and gas in apparently good traps. The following is the writer's interpretation of significant periods of folding and faulting that developed the known structures in Wyoming.