on the south, and the Cordilleran geosyncline on the west during much of Paleozoic time. Subsequent to the widespread pre-Cambrian erosion, the San Luis platform oscillated downward episodically sufficiently to allow the deposition of Cambrian, Ordovician, Devonian, and Mississippian carbonate and sorted clastic strata as shelf sediments grading and thickening westward into basinal equivalents. A major positive oscillation resulted in the stripping-off of virtually all of the Ordovician shelf sediments during Silurian time.

2. Shelf conditions succeeded a widespread erosion interval during which the Molas shale was formed as a complex soil profile of early Pennsylvanian age. The earliest Pennsylvanian marine sediments thus are shelf carbonates which contain a vast pre-Des Moines intraformational disconformity that preceded the basination of the Paradox geosyncline.

3. Localized subsidence of a major part of the former widespread San Luis platform occurred to form the Paradox evaporite basin, which was a southeast-projecting arm of the Cordilleran geosyncline. Local shelves to the Paradox geosyncline, in which shelf carbonates and clastics were Kaiparowits basins. Marine access-ways to the Paradox basin existed on the northwest and on the southeast, with the San Rafael, Kaibab, Uncompahgre-San Luis-Nacimiento, and Zuni uplifts providing localized positive barriers tectonically accentuated during Pennsylvanian time.

4. Rapid rise of the Uncompahgre and Nacimiento uplifts caused coarse clastic arkosic sediments to be dumped into Hermosa seas from the northeast and east and Kaibab-Supai fine clastics from the south and west. Bodily uplift of the entire Four Corners region to continental conditions which existed from latest Pennsylvanian to latest Jurassic time.

3. Wm. Lee Stokes, University of Utah, Salt Lake City, Utah, "Western Margin of the Rocky Mountain Geosyncline in the Great Basin."

The concept of an inner (miogeosynclinal) belt and an outer (eugeosynclinal) belt in the Paleozoic of the Great Basin is useful in a broad general way. It is impossible, however, to draw a well marked dividing line between the two troughs not only for the Paleozoic as a whole but also for the individual systems. It seems certain that no sharp uplift or even linear group of uplifts ever separated the troughs and that it is fruitless to search for sharply defined edges for either trough.

The miogeosynclinal sediments are chiefly carbonates with minor shales and sandstones, the eugeosynclinal sediments are highly siliceous types such as chert, arkose, argillite, tuff, and black shale. Tongues of carbonate rock extend westward into the eugeosyncline, and, conversely, beds of black shale and chert are found in the miogeosyncline.

On the basis of aggregate lithologic aspect the western edge of the Rocky Mountain geosyncline has roughly the following course through the Great Basin: commencing near Burley, Idaho, thence to the northwestern corner of Utah, continuing successively through Wells, Cortez, Manhattan, and Goldfield, Nevada, and ending near Owens Lake, California.

Cover of Tertiary sediments and volcanic derivatives is thick and extensive over much of the eugeosyncline and unless deep wells are drilled there the exact nature of the older rocks may never be known.

4. J. Stewart Williams, Utah State Agricultural College, Logan, Utah, "Carboniferous and Permian Stratigraphy of the Oquirrh Basin, Northwestern Utah."

The Oquirrh basin, the dominant element in the late Paleozoic history of northwestern Utah and adjacent areas, first developed near the eastern margin of the Cordilleran miogeosyncline in medial Mississippian time. From then until the medial Permian, it existed continuously with alternate times of extension and contraction, the extensions being generally northwestward toward central Idaho and southwestward toward northeastern Nevada. Times of increased tectonism, which appear to be represented in accentuation of subsidiary basins and rise of marginal positive areas, with attendant contraction of the sea, were Meramecian and early Chesterian, Morrowan-Lampasan, Missourian-Virgilian, and early Wolfcampian. Times of decreased tectonism with less rapid depression and wider spreading of the marine waters were Desmoinesian and Leonardian-early Guadalupian. Particularly noteworthy are the Logan-Milligen sub-basin of early Chesterian time, the main basin in Wolfcampian time, and the Diamond Creek and Lower Park City sub-basins of late Wolfcampian and early Leonardian time. In the latter, dolomite, red and buff sandstone, and anhydrite were deposited to notable thicknesses.

The eastern margin of the Oquirrh basin was exceptionally abrupt and the remarkable change of facies exhibited there is accentuated by overthrusting which has moved the basin facies tens of miles eastward on to the shelf facies.

5. E. C. Reed, Nebraska Geological Survey, Lincoln, Nebraska, "Present Knowledge of Paleozoic Geologic History of the Denver Basin and Adjacent Parts of Western Nebraska and Northwestern Kansas."

The general lithologic character of the Paleozoic rocks of the Northern Mid-Continent region 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.