(Meramecian) in age and therefore had no influence on the earlier deposition of Mississippian sediments. The Mississippian system in this region is represented by the Madison, Leadville, Redwall, Humbug, and Manning Canyon formations. The Humbug and Manning Canyon formations are present only in the northwestern part of the area, due to erosion of the Humbug and the fact that the Manning Canyon was deposited only in the area of the Oquirrh basin of central Utah. At the close of Humbug time, strata of the Mississippian system formed the eastern shelf of the Cordilleran miogeosyncline, and was exposed over the positive area of the Southern Colorado Plateau, now known as the Paradox, Black Mesa, and San Juan basins.

The possibilities of finding oil and gas accumulations in the thick, commonly porous, carbonate sediments of Mississippian age are favorable along the Cordilleran shelf, or hinge area. Both stratigraphic and structural conditions are favorable in this area. The only Mississippian oil production in Utah is in the Paradox basin at the Big Flat unit, discovered in 1957 by the Pure Oil Company. The complex, subsurface, structural conditions of the Mississippian strata, in the Paradox basin, imply excellent possibilities for oil accumulation in structural traps.

It is concluded that there is a Cordilleran shelf or hinge area in south-central Utah and that the Mississippian formations can probably be correlated throughout the Four Corners region.

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Dakota Stratigraphy in San Juan Basin

Subsurface stratigraphic study of the Dakota formation in the San Juan baisn area of northwestern New Mexico and southwestern Colorado has been facilitated by (1) published stratigraphic sections along its outcrop, (2) good distribution and density of well control, and (3) presence of a persistent, superjacent marker—the Greenhorn limestone (zone of *Inoceramus labiatus*).

The Dakota formation is the basal sandstone of an early Late Cretaceous transgression that probably reached its maximum extent in this area during latest Greenhorn time. It overlies a rather even erosion surface developed on the Morrison and Burro Canyon formations.

The Dakota may be divided into three units in the San Juan basin area. The lower unit is predominantly non-marine and generally consists of a basal conglomeratic sandstone overlain by carbonaceous shales that commonly contain thin coal beds and lenticular sandstones.

Overlying the basal Dakota and grading upward into the Graneros shale is a 30–100-foot-thick transgressive middle unit, predominantly sandstone, that becomes progressively younger from east to west. These middle Dakota sandstones probably were deposited as nearshore sands along the westward margin of the advancing Cretaceous sea during Belle Fourche and early Greenhorn time. Careful correlation in the subsurface and between the subsurface and outcrop sections shows the interval between the base of the Greenhorn and the top of the middle unit to be more than 200 feet in thickness in the southeast part of the basin, about 150 feet in the southwest and northeast part, about 100 feet in the west-central part, and less than 50 feet along the west and northwest margins. These and other relationships suggest that regionally middle Dakota strand lines, unlike those of succeeding Upper Cretaceous strata, trend northeast-southwest in the southern part of the basin and north-south in the northern part.

The sandstones of the upper unit of the Dakota intertongue with the Graneros shale and are developed in one or more correlative intervals below the Greenhorn limestone. They commonly occur as lenses, are early Greenhorn in age, and have been referred to as "Tres Hermanos sandstone" in outcrop sections along the southern border of the basin and as "Graneros sands" in the subsurface. These sandstone tongues probably represent minor regressive phases resulting from local increase in sand supply during the major Dakota transgression. The uppermost interval of widespread sandstone development occurs about 30 feet below the base of the Greenhorn and locally is more than 50 feet thick in the southwest part of the basin. Its distribution and northeast pinch-out suggest the source of the sand was at the southwest and that by the time of its deposition regional northwest-southeast "trends" had been established.

Present Dakota production is largely from stratigraphic accumulations in the San Juan basin and from structural accumulations in the platform area along its northwest margin. The variations in shoreline trend during Dakota deposition suggest diverse orientation of trends for new Dakota discoveries.

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Marine Redbeds in Central Colorado Basin

Considerable, difference of opinion is reflected in geologic literature concerning the environment of deposition of redbeds. Many geologists apparently assume that red coloration (hematite) in sediments can be preserved only under conditions of subaerial deposition, and they therefore assume that all redbeds are continental sediments. These assumptions are not valid. If an adequate source of hematite is available, redbeds can originate in any environment, continental or marine, in which