sive limestone cliffs up to 500 ft thick are present in southwestern New Mexico and southeastern Arizona.

Horquilla reefs, 1,200 ft thick, were described and photographed by Zeller in the Big Hatchet Mountains. The reef started growing in Desmoinesian time and grew into early Wolfcampian time. Numerous reefs in West Texas and southeastern New Mexico grew at the same time and have produced billions of barrels of oil.

Porous Epitaph Dolomite is visible in the Big Hatchet Mountains, reefs are present in the Mustang Mountains, and lagoonal evaporites are present in the Whetstone Mountains of Cochise County, Arizona. Presence of backreef evaporites up to 200 ft thick lends evidence that the Leonardian-age Epitaph Dolomite could be analogous to the prolific Abo production of southeastern New Mexico.

Lower Cretaceous beds contain rudistid, coralline, algal, bioclastic banks up to 500 ft thick in the Big Hatchet Mountains and 200 ft thick in the Mule Mountains of southeastern Arizona.

The large Pedregosa basin contains more than 25,000 ft of sedimentary rocks. For most of Paleozoic time, the basin had a history of environment and structural evolution similar to the Permian basin of West Texas and southeastern New Mexico. Billions of barrels of oil and tens of trillions of cubic feet of gas have been produced in the Permian basin. I believe a like amount will be found in the Pedregosa basin.

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OIL AND GAS POTENTIAL—PARADOX FOLD AND FAULT BELT, COLORADO AND UTAH.

(No abstract submitted)

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PLANKTONIC FORAMINIFERAL TEST-POROSITY AS PALEOTEMPERATURE INDICATOR

(No abstract submitted)

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EARLY PERMIAN UNCONFORMITY IN SOUTHEASTERN WYOMING AND NORTH-CENTRAL COLORADO

Evidence for the existence of an unconformity in southeastern Wyoming and north-central Colorado between rocks of the Goose Egg Formation, the Owl Canyon Formation, or the Lyons Sandstone and the Casper or Ingleside Formations is provided by reworked basal sandy zones and conglomerates, truncation of underlying cross-strata, local relief, possible "duricrust" or caliche zones in subjacent rocks, and an isopach description of the configuration of the erosion surface.

Subjacent strata range from Wolfcampian to pre-Desmoinesian age. The subcrop becomes older from east to west. Superjacent strata belong to 3 units ranging from early to late Leonardian. In the southern and central Laramie Range and most of the Laramie basin, the Owl Canyon Formation forms the supercrop. It thins to a zero edge northward and westward by depositional onlap and fills in relief on the underlying unconformity. The Opeche Shale Member of the Goose Egg Formation constitutes the supercrop in the Shirley basin, the northern Laramie Range, and probably most of the western study area. It thins northward slightly in the Shirley basin and the northern Laramie Range and fills in relief on the underlying erosion surface. The Lyons Sandstone forms the supercrop on the southwest margin of the Laramie basin.

Stratigraphic relations in southeastern Wyoming are in accord with an interpretation of the growth of an extensive land area and its transgression in the Rocky Mountain and western Mid-Continent areas in Early Permian time.

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HYDROCARBON DISTRIBUTION IN CASPER FORMATION (PERMIAN-PENNSYLVANIAN) OF LARAMIE AND SHIRLEY BASINS, WYOMING

Hydrocarbon production from the Casper Formation in the Laramie and Shirley basins of southeastern Wyoming is exclusively from sandstones on closed Laramide structures. Total recoverable reserves are approximately 8 million bbl, half of which is found in the Quealy Dome structure of the southern Laramie basin. The presence of closed structures which are barren of Casper oil suggests that factors other than the present structural configuration are important in controlling the oil distribution in the Casper Formation.

Subsurface data from 137 wells indicate that the present distribution of Casper oil and oil shows is a complex function involving pre-Laramide structural growth, the configuration of the post-Casper unconformity, sandstone porosity (and permeability) patterns in the upper part of the Casper Formation, and the development of Laramide structure. The relative paucity of Casper oil may be related to an extreme distance of migration from the source rock and the presence of major permeability barriers in the upper Casper Formation along the paths of early migration.

Prospects for major accumulations of Casper oil do not appear to be good although stratigraphic traps similar to those found in the eastern Powder River basin are possible.

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DEPOSITIONAL DYNAMICS OF UPPER CRETACEOUS SANDSTONES, ROCKY MOUNTAIN REGION

Throughout the Rocky Mountain region, numerous Upper Cretaceous intervals display a sequence of deposits, from the base upward, of (1) marine and/or lagoonal shale, (2) barrier-island sandstone, (3) marsh-mudflat deposits, (4) lagoonal-bay deposits, and (5) alluvial–coastal plain sediments. These sequences record seaward progradation of coastal plain, transitional, and nearshore marine deposits in response to a large sediment supply and continuous subsidence.

Barrier-island sandstone units display a characteristic upward sequence of infra-surfzone, surfzone, and beach deposits which reflect depositional regressions. The vertical succession of sedimentary structures in a barrier-island sandstone records building up of the sea floor until a segment emerged and a barrier beach formed.

Sand enters the sea through deltaic distributaries and tidal passes and is transported downcoast by longshore currents and littoral or beach drift to nourish and prograde barrier-island sand bodies. The geologic record is strongly biased toward preservation of case histories