Post-Leadville Limestone, Pre-Organ Rock Sandstone Faulting in the Paradox Basin, Colorado and Utah

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Seismic data and well control indicate numerous normal and reverse faults that cut Mississippian rocks and die out upwards below the Permian synorogenic rocks of the Cutler Group. Some of these faults or fault trends are interpreted to have controlled where flowing salt was deflected upward to create salt walls and diapirs and associated hydrocarbon traps. In some areas, hydrocarbons were trapped in Devonian and Mississippian reservoirs by these early faults and folds. Faults that cut the Mississippian rocks below the salt walls die out upward into the salt. Where salt welds are present in the basins adjacent to the walls, these faults terminate upward against the weld and do not cut upward into overlying strata. The data indicate that faults formed before, during and after salt deposition during the late Morrowan to earliest Missourian, but mostly during the Desmoinesian, and before the main deposition of the Organ Rock (Cutler Group). The seismic and well data show that some of these faults cut into and controlled growth of the Honaker Trail and Elephant Canyon Formations during late Pennsylvanian and earliest Permian, especially in the deepest part of the Paradox Basin. The age relationships indicate that the earliest extension took place before the Paradox Basin formed and that the reverse faulting and later faulting occurred later, possibly coeval with the initial development of the Uncompahge Uplift during the latest Pennsylvanian and earliest Permian. There was reactivation of some of the faults during Mesozoic and Early Cenozoic orogenic events. More detailed interpretations depend on availability of additional industry data. In any case, untested fault traps with indigenous source rocks and salt seals provide numerous exploration targets.