

## A Valley of Paradoxes

By Dennis Payton Knight

A paradox is a soundly reasoned proposition that leads to an illogical conclusion. Such it is that the Dolores River, instead of flowing through a valley of its own orderly carving, cuts across the middle of another. And that is how Colorado's Paradox Valley got its name, from the geologist-surveyor, Albert Peale, observing the Dolores had a "desire to perform strange and unexpected things."

It was some 300 million years ago when underlying salt deposits from the middle Pennsylvanian period collapsed from ground water. In a process of 150 million years called salt tectonics, it formed the depression that is the Paradox Valley. The Dolores, meandering nearby, found the shortcut, and the paradox of a valley perpendicular to a river flowing through it was born.

A domain of the Utes, the Paradox Valley was included as part of an 1868 treaty creating a reservation for the tribe over much of western Colorado. But within a decade, squatters began grazing cattle, and the land was officially opened to settlers by Congress in 1882. There was dependable water to attract more farmers, and miners added to the influx when copper was discovered near the town of Bedrock.

Early in the twentieth century, the Paradox Valley and surrounding plateau became an important source of radioactive materials, and the *New York Times* identified mines in the Paradox Valley as "the greatest radium ore deposits in the world." Production of radium stopped in 1922, however, when richer deposits were found in the Congo, but production of uranium continued for more than half a century, ending in the 1980s.

A *New Yorker* article in 2010 identified the heavy rate of "uranium widows" left behind in the Paradox Valley from the mining period. It noted Colorado's atomic history is full of such paradoxes, and that a large-scale mill processing radioactive elements had been placed in the valley in 1912 in the very hope of curing cancer, based on the work of Marie and Pierre Curie. Score another for the valley.

In 2009, Energy Fuels Research Corporation proposed, against strong opposition from environmentalists, building a uranium mill in sight of the valley, but a downturn in prices and perhaps the opposition has put that project on indefinite hold.

Because of salt beds at or near the surface, the Dolores naturally picks up as much as 200,000 tons of salt in the valley every year on its way to the Colorado River. In the 1980s, the Bureau of Reclamation instituted a massive salinity control project to remove brine and inject it up to 16,000 feet down into Precambrian and Paleozoic rocks. By 2009, the system was removing about 113,000 tons of salt annually from the Paradox Valley. Now the Colorado River is less salty, but the injection well has induced thousands of earthquakes in the valley, mostly undetectable, although several have registered over 2.5 in magnitude, and in 2000 one hit 4.3 on the Richter Scale. Another paradox in the valley?