

siderations which are often confusing and contradictory, and which often appear to defy solution. With the constantly declining ratio of reserves to yearly production, can the demands be met?

MIDDLE PERMIAN EVAPORITES IN SOUTHWESTERN OKLAHOMA

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The two thickest outcrop sections of evaporites in the Midcontinent region of the United States are in the Blaine and Cloud Chief formations of southwestern Oklahoma. Each is composed mainly of gypsum at the outcrop and of anhydrite in subsurface.

The earlier sequence is the Blaine, of Late Leonardian or Early Guadalupian age. It has maximum thickness of 250 feet and consists of four principal cycles. Each cycle is a three-fold division beginning with dolomite less than 5 feet thick, continuing upward with white gypsum normally 15-30 feet thick, and ending with reddish-brown shale 10-30 feet thick.

The upper half of the Blaine formation is 90 feet thick and is made up of massive gypsum containing as many as four thin dolomite beds but practically no shales, thus representing a composite of several incomplete normal cycles. Northward in subsurface this evaporite unit grades into nearly pure halite.

Four hundred feet above the Blaine is the thickest single evaporite body in the Midcontinent region. It is in the lower part of the Cloud Chief formation, of probable Late Guadalupian age, and consists of gypsum and anhydrite 120 feet thick with no interbedded shale or dolomite. Extensive core drilling has shown that the Cloud Chief evaporite body is massive and non-cyclic. By Cloud Chief time the position of the evaporite basin had shifted markedly eastward, as it was then situated over the shoreward or clastic facies of the Blaine. The Cloud Chief gypsum also is noteworthy for containing marginal tongues of strontium minerals, chiefly celestite, and for containing in the massive gypsum a few small nodules of the borate mineral prober-tite.

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IMPLICATIONS OF PALEOGEOLOGIC MAPS OF NORTH AMERICA

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A sequence of subcrop and paleogeologic maps of North America are presented showing the geology at the beginning of the Ordovician, Devonian, Mississippian, Pennsylvanian and Cretaceous systems.

There are many implications to be seen in such a set of maps. Some are as follows:

1. The continent has been in repeated periods of broad structural upswells in which great arches formed. Later the crests were eroded, the surface peneplaned, and the overlying sediments deposited across the truncated edges of the older rocks.

2. The intervening basins are structural and not depositional in nature. Their location is fortuitous, inasmuch as the boundaries are formed by arches that occurred at different times.