

Structures of Northern Iraq and Syria, and Their Implications for Interpretation of the Region's Stratigraphy

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Several anticlines in northern Iraq and Syria were studied through the construction of balanced and restored cross sections. The data suggest that while each of the anticlines developed due to compression related to the Zagros Orogeny, they are the result of inversion of normal faults with a long history of episodic extension. Viewing these structures as part of the development of the foreland rather than elements of the Zagros fold belt allows a regional perspective that differs from the traditional tectonic zoning of the Arabian plate. This interpretation suggests that the structural fabric of the Northern Arabian plate is inherited from Precambrian trends and the geologic history of the region is one of recurrent reactivation of pre-existing features. The region's history is similar to other areas at the northern periphery of the African Continent where relatively stable blocks, or mesetas are separated by linear tectonic basins which have undergone late stage inversion.

The tectonic basins may have initiated as Precambrian suture zones or strike-slip fault zones. However, most of the sediment accumulated in these basins during later Phanerozoic periods of extension and rifting. The tectonic imprint on eustatic depositional cycles produced different stratigraphic successions on the mesetas when compared to the stratigraphy of the basins. The stratigraphy of the mesetas are dominated by high stand sequences and unconformities whereas the basins are dominated by low stand sequences and condensed zones in which the facies tracts are often modified by tectonism. These differences in local stratigraphy present major problems for workers attempting to resolve the regional stratigraphy by correlating well log data without the aid of seismic data.

The Campanian to Maastrichtian interval provides an effective example. During the Campanian, fringing Rudist reefs developed around the mesetas with a correlative condensed interval in the basins, whereas during the Maastrichtian these units are overlain by Olistostromes and basinal marls in the basins and correlative unconformities on the mesetas. The evidence indicates that the Shiranish Formation cannot be a lateral time transgressive equivalent of Campanian Rudist biohermal units including the Massive, Pilsner, Hartha, and Aqra-Bekhme Formations. The Rudist biohermal units developed on opposite sides of rift basins which later filled with the Shiranish Formation.