AAPG International Conference
Barcelona, Spain
September 21-24, 2003

Martin P. A. Jackson[1], Michael R. Hudec[2] (1) The University of Texas at Austin, Austin, TX (2) Bureau of Economic Geology, Jackson School of Geosciences, The University of Texas at Austin, Austin, TX

The Great Escape: Pressurized Extrusion of Allochthonous Salt Sheets in Orogenic Belts

Two types of allochthonous salt sheets survive in the external domains of some orogenic belts: those emplaced before compression and those emplaced during compression. Preorogenic salt sheets are exemplified by the Betic-Rif arc in the western Mediterranean region. These sheets extruded on a Cretaceous-Eocene passive margin and were later dismembered and transported in a telescoping accretionary complex. Our talk focuses on the second type of salt sheets: those expelled by orogenic shortening. As first recognized in the Zagros Fold Belt, orogenic shortening pressurizes the source layer and squeezes salt diapirs, expelling evaporites as allochthonous salt extrusions. Advance of these sheets is promoted by thick salt remaining in the source layer, large width of squeezed diapirs, high rates of shortening, and low rates of erosion, dissolution, and sedimentation at the allochthon's leading edge. Salt sheets can advance much faster than tectonically driven nappes. We document a new example from the Neoproterozoic Katangan rocks in the Copperbelt of Shaba (D. R. Congo). Here, a large sheet of commingled Roan evaporite and carbonate-dominated sediments and ores was extruded outward by ~65 km during the Lufilian Orogeny (850-650 Ma). Extrusion was fast enough to blanket a uniform preorogenic footwall without overriding any synorogenic deposits. Continued shortening then stacked large thrust sheets across the lubricating salt-sediment extrusive mélange. Evacuation of salt during extrusion created a large synorogenic piggyback basin, a process operating today in the Salt Range of the Himalayan foreland.