Basin Migration and Asymmetry in the Dead Sea Rift

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The Dead Sea rift is a transform fault which extends from the Red Sea spreading center to the Taurus-Zagros subduction zone, and separates the Levantine (Sinai-Israel) and Arabian plates. The offset of pre-Senonian (Upper Cretaceous) sedimentary, igneous and structural features indicates a 100-110 km left-lateral slip, with an anticlockwise rotation.

The Dead Sea depression sensu stricto, forms the deepest continental part of the Dear Sea rift, with up tp 10,000 m of Late Neogene to Recent evaporites and clastics. It is occupied by three distinct sedimentary bodies, deposited in basins whose depocenters are displaced northward with time. The are: the continental red beds of the Hazeva Formation (Miocene), the Bira-Lido-Gesher marls and the exceptionally thick rocksalt of the Sedom Formation (Pliocene-Early Pleistocene), and the successive Amora, Lisan and Dead Sea evaporites and clastics (Early Pleistocene – Recent).

Lengthwise and crosswise asymmetries of these sedimentary basins and their respective depocenters are due to: left-lateral shear combined with anticlockwise rotation of the Arabian (eastern) plate; steeper faulting of the crustal eastern margin than of the western sedimentary margin, and modification of the depositional pattern by twice filling up of basins, by Hazeva red beds during Late Miocene pause of shear and by Sedom rocksalt during Pliocene marine ingression (Quennell, 1959; Freund, 1965; Zak and Freund, 1981).

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