Annual Geological Conference 2000

Shangri-La Hotel, Penang

8-9 September 2000

Abstracts of Papers & Posters

Tectonic and Structural Development of Cenozoic Basins of Malaysia

H.D. TJIA

PETRONAS Research & Scientific Services Sdn. Bhd.
Lots 3288 & 3289, Off Jalan Ayer Itam, Bangi Institutional Area
43000 Kajang, Selangor, Malaysia

The Cenozoic Malaysian basins are (1) located in the interior of semicratonic continental crust (Malay basin, its satellite basins, and the Penyu basin); (2) located in marginal belts of semicratonic continental crust (small, faulted depressions in the Strait of Melaka and onshore Peninsular Malaysia); (3) straddling collisional plate boundaries (Sarawak and NW Sabah basins); (4) associated with a microcontinent (Sandakan, Labuk Bay, Malawali and Tidung basins, and the circular basins of Sabah). The basin development shows the following pattern. Rifting, thermal subsidence and modification by transtensional and/or transpressional wrench faulting are the tectonic processes that operate on depressions underlain by continental crust. The crust could belong to large plates or represent a microcontinent. The basins may develop as (a) aulacogens atop a mantle-plume dome (Malay and Penyu), or (b) pullaparts where wrench faulting is the main reactivator of basement fractures. The onshore Tertiary basins of Peninsular Malaysia and the Strait of Melaka are of this type. Inverted structures are the rule, as are reversals of slip sense on the wrench faults. (c) At collisional plate boundaries, large depressions are initially formed by active subsidence of the basin floor in the subduction trench. The growing accretionary prism on the landward side of the trench wall enhances the basin depth. After subduction ceases, isostatic adjustments depresses the basin further, increasing its holding capacity. (d) The NE Sabah and Tidung basins originated as rifts in the break-up of the East Sabah microcontinent. (e) The origin and development of the circular basins of Sabah are unresolved issues. Their main features include the predominantly extensional character shown by their structures, rounded planimetric outline, and kink-like geographical distribution of which the ends are in Sandakan Bay and at Cowie Harbour.