



CARBONATE PLATFORMS AND OTHER BUILD-UPS IN THAILAND AND LAOS

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ABSTRACT

Large carbonate build-up attached platforms are classified as homoclinal ramps, distally steepened ramps, non-rimmed and rimmed shelves. In the past continents such as the Late Ordovician of Laurentia (N. America) have been almost covered in shallow seas due mainly to expansion of oceanic spreading ridges. Fortunately, such epeiric seas do not exist today.

Thailand has significant carbonate build-ups in the Sibumasu Terrane (SIB on page 42 of field guide) ranging from the Thung Song platform from the mid-Tremadocian to the Early Devonian which are tropical limestones (see p.43-45) and from the Kungurian to the Triassic which range from post-glacial temperate to temperate to tropical. The Tarutao Group siliciclastic platform (Furongian to mid-Tremadoc) was probably formed post orogenically and erosion of the orogen allowed a tropical rimmed Thung Song Group carbonate platform to develop on the flat eroded surface. Deep water deposits characterised by cold water trilobites and conodonts, are represented by the Pa Kae Formation of Katian age which is composed of either deep-water stromatolites or structures of mysterious origin (pgs. 31-33, 44 in guide). In the amalgamated Indochina Terrane, in Lao PDR and Vietnam, a tropical carbonate platform was established in the Givetian and terminated in the Tournaisian by a proposed collision of the Truong Son and Loei-Phetchabun Terranes along the Loei Suture leading to uplift and the deposition of widespread siliciclastics (pgs 45-46 in guide). A second period of tropical carbonate deposition followed from the late Tournaisian to the late Permian. This was terminated in the middle to late Permian by deposition of, for example, the siliciclastic Pha Dua Fm (p. 46) and latest Permian carbonate breccias in Phetchabun. The Permian of Indochina (p.46) is characterised by moderate size carbonate platforms separated by deep water basins (such as the Nam-Duk and Hong Pong basins) containing deeper water fauna elements such as conodonts (in calciturbidites), radiolaria in cherts plus ostracods (pages 47-48). The geochemistry of the Nong Pong Basin (p. 48) indicates a pelagic regime indicating substantial separation of the carbonate platforms to the south and north and little influence from continental terrigenous material.

Isolated carbonate platforms may also be separated by oceanic crust. This crust may be restricted as in the Red Sea (p. 48). Moderate-sized isolated carbonate platforms such as the ramp to rimmed platform of the Ordovician of Tasmania (p. 52) are smaller examples of the large epeiric seas and likewise are constructed by numerous allocycles of peritidal, intertidal to subtidal carbonates known as Punctuated Aggradational Cycles (PACS) (pgs. 53-55) where the carbonate factory competes with, but keeps up, with rising relative sea level constructing 1200 m of shallow water limestone.

Smaller carbonate build-ups are well known around island arcs such as the Triassic limestones of the Sukhothai Volcanic Arc Terrane of N Thailand. Even smaller limestone build-ups are well known around volcanic islands (pgs.57-58) where coral dominated reefs form atolls. Seamounts and guyots are abundant in all oceans and ride on the oceanic plates where whilst subducting are incorporated in to the accretionary complex. This scenario has been suggested

for the limestone build-ups (such as Doi Chiang Dao , p. 56) and intervening siliciclastics and volcanics of the Inthanon Terrane (or Zone) in N Thailand (INT on p. 55). However, the Carboniferous to Permian limestones of the Inthanon were deposited in shallow water for 100 million years (p. 56) which is difficult to envisage for seamounts on a descending oceanic conveyor (p. 57-58). Isolated carbonate platforms (ICPs) on continental crust have recently been studied in detail in the margins of South China Sea (averaging a few tens of kms) and in the Mediterranean (up 100 kms) (pgs. 59- 64). The largest of the Mediterranean type ICPs is the long lived Eratosthenes ICP which is surrounded by deep water basins (p.66) and may provide a more realistic model for the Carboniferous to Permian carbonate build-ups of the Inthanon Terrane (p.67).