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Tectonomagmatic evolution of Peninsular Malaysia: some observations and comments

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In the past decade, a number of models pertaining to the tectonomagmatic evolution of Peninsular Malaysia have been published. The basic theme of most of these models is the closure of an ocean basin through eastward subduction resulting in the Late Triassic collision of two continental blocks (eastern and western blocks of Peninsular Malaysia). Such tectonic schemes regard the Triassic sediments as part of an accretionary wedge and the Main Range granitoids as collision related consequent upon crustal thickening. Many geological observations, however, cannot be reconciled with such models.

The magmatism in the central belt does not find any ready explanation in the published schemes. If the Main Range granite (of Late Triassic age) is collision related, then the timing of the collision must be earlier than the Late Triassic since there would be a time gap between the crustal thickening episode and granite magmatism. This is because the rate of crustal thickening during collision is faster in comparison with the establishment of a steady state geotherm.

There are several lines of evidence (spatial disposition and structural style of the Palaeozoic and Triassic sediments, occurrence of olistostrome type diamictites of probable Permian/Early Triassic age along the Bentong - Raub line) to suggest that the eastern and western blocks were amalgamated probably during the Carboniferous - Lower Permian time and that the Triassic sedimentation occurred in post-amalgamation rift basins. The rifting and central belt magmatism seem to be related.

If the Carboniferous/Lower Permian amalgamation time is correct, then the Late Triassic granites may not be directly collision related. The absence of horizontal structures of the like found in typical overthrust belts of collision zones implies a very oblique collision and hence significant crustal thickening, a pre-requisite for collisional granite magmatism, can also be discounted. In view of this and taking note of the rift setting of the Triassic sediments, it seems likely that the Main Range and other Late Triassic granitoids are the products of remobilized crusts with steep thermal gradients. Higher heat production due to higher concentration of heat producing elements and pressure release in a tensional setting are probably responsible for the steep thermal gradients.

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