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Late Cretaceous to Eocene metamorphism of internal zones of the Indo-Burma range (western Myanmar): geodynamic implications. About the paper by Anne Socquet et al. ☆

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In their paper, Anne Socquet et al. [5] present the first quantitative metamorphic data on internal zones of an almost unknown mountain range: the Indo-Burma range [1]. Their analysis provides new information on metamorphic facies that were subducted at high-pressure conditions, and then exhumed at the front of the Himalayan convergence zone. The core complex type metamorphic dome model, initiating in a crustal prism and composed of sediments of the front of the subduction zone, is similar to models proposed for the Alpine and Circum-Pacific ranges. The metamorphic analysis of internal zones of the range is essentially based on chlorite–mica equilibriums in the Triassic metapelites. The petrologic characteristics are analysed with a new geothermal barometer based on local chlorite–phengite equilibriums in the metapelites. With this tool, one can find an innovative application of the new models for solid solutions developed by Vidal et al. [6, 7] and Parra et al. [4]. It is thus possible to calculate precise and continuous pressure–temperature paths for the prograde and the retrograde phases, which constrain geodynamical models and, in particular, exhumation processes. Hence, we can confirm the impact of thermo-barometric methods developed by Goffé et al. [2, 3] on chlorite–mica–phengite phyllosilicates for rocks depleted in minerals marker of metamorphism. During the prograde thickening phase, the crustal geotherm goes from a normal geotherm of 30 °C km^{-1} to a thickened-crust geotherm of 18 °C km^{-1}. The peak metamorphic conditions are near 8–9 kbar and 450 °C. Because these facies are located at the Nagaland ophiolitic thrust footwall, the thickening (25–30 km) of the crust was most likely initiated in an Upper Cretaceous–Eocene prism, in front of the obduction. The cold-retrograde path obtained necessitates a slow exhumation with a thermal balance controlled by a cold screen effect. It can initiate along a detachment shear zone associated with the opening of the central Burmese basins. The HP micaschists are exhumed in the core of the dome, under the Triassic schists, located at the roof of the detachment.

Besides the goal and the originality of the petrological study, this article brings information on an almost unknown range (the Arakan or Indo-Burmese Range), located between the Sunda trench and the East Himalayan syntaxis. The understanding of the geodynamic evolution of this part of the Himalayas is essential to comprehend the early stages of the India–Asia collision and the formation of Eocene accretionary prisms, which leftovers subducted deeply under the Himalayas. This early part of the history of the continental subduction is thus almost not documented as a possibility to absorb plate convergence. In general models of mechanics of continental deformation, as well as in controversial balances of the Tertiary Asian plate tectonics, it is thus a primordial necessity to take into account the geodynamical evolution of this region as an element of discussion.

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