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A SPECULATIVE TECTONIC MODEL FOR THE EVOLUTION OF NW HIMALAYA AND KARAKORAM

M. QASIM JAN AND M. ASIF

NCE & Department of Geology, University of Peshawar

The Himalayas are commonly considered to be the product of collision between the Asiatic and Indo-Pakistan plates. A number of plate tectonic models have recently been proposed for the NW Himalayas. Tahirkheli *et al.* (1979), Klootwijk *et al.* (1979), and Virdi (1981) suggested the formation of Kohistan-Ladakh island arc between the two plates. Coward *et al.* (in press, 1982) found that the structure of the Kohistan zone is much complex for such a simple interpretation. Complicated models, involving north- and south-facing subduction zones have been envisaged by Andrews-Speed and Brookfield (1982) and Windley (pers. comm.).

We present here a model (Fig. 1) supported by new radiometric ages. The major sequence of events during the evolution of NW Himalaya and Karakoram of Pakistan and Kashmir is tentatively proposed here to be as follows:

(1) Early to Mid Cretaceous: N-facing subduction of the Neo-Tethyan oceanic crust to produce volcanic and plutonic rocks (Dras, Chalt- Shyoke, Kohistan amphibolites) resulting in the formation of the Kohistan-Ladakh island arc. (2) Late Cretaceous: Intrusion of the Chilas, Jijal, Kargil basic complex(es); and development of blueschists. (3) Paleocene to very Early Eocene: Collision of the island arc with India (Powell, 1979); obduction of ophiolites and blueschists; simultaneous N- and S-facing subduction of the oceanic crust intervening between a Gondwanic microcontinent and the island arc to produce the earlier phases in the Karakoram- and Kohistan-Ladakh granitic belts, regional metamorphism. (4) Eocene to Early Miocene: Eruption of Eocene Kalam volcanics; younger intrusions (some derived from continental crustal material ?) in the two granitic belts (Jan *et al.*, 1981). (5) Post-Early Miocene: Crustal thickening and production of the youngest granitic rocks in the Karakoram belt.

The tectonic position of the Khunjerab-Tirich Mir granitic belt (115–84 m.y.) is not clear to us. These rocks might be a product of N-facing subduction N of the microcontinent (? Reshun Fault or Chitral-Upper Hunza Fault of Desio, 1979), however no ophiolitic rocks have so far been found in this area. An alternative of this is to thnik that the granites are of Late Cimmerian tectonic phase

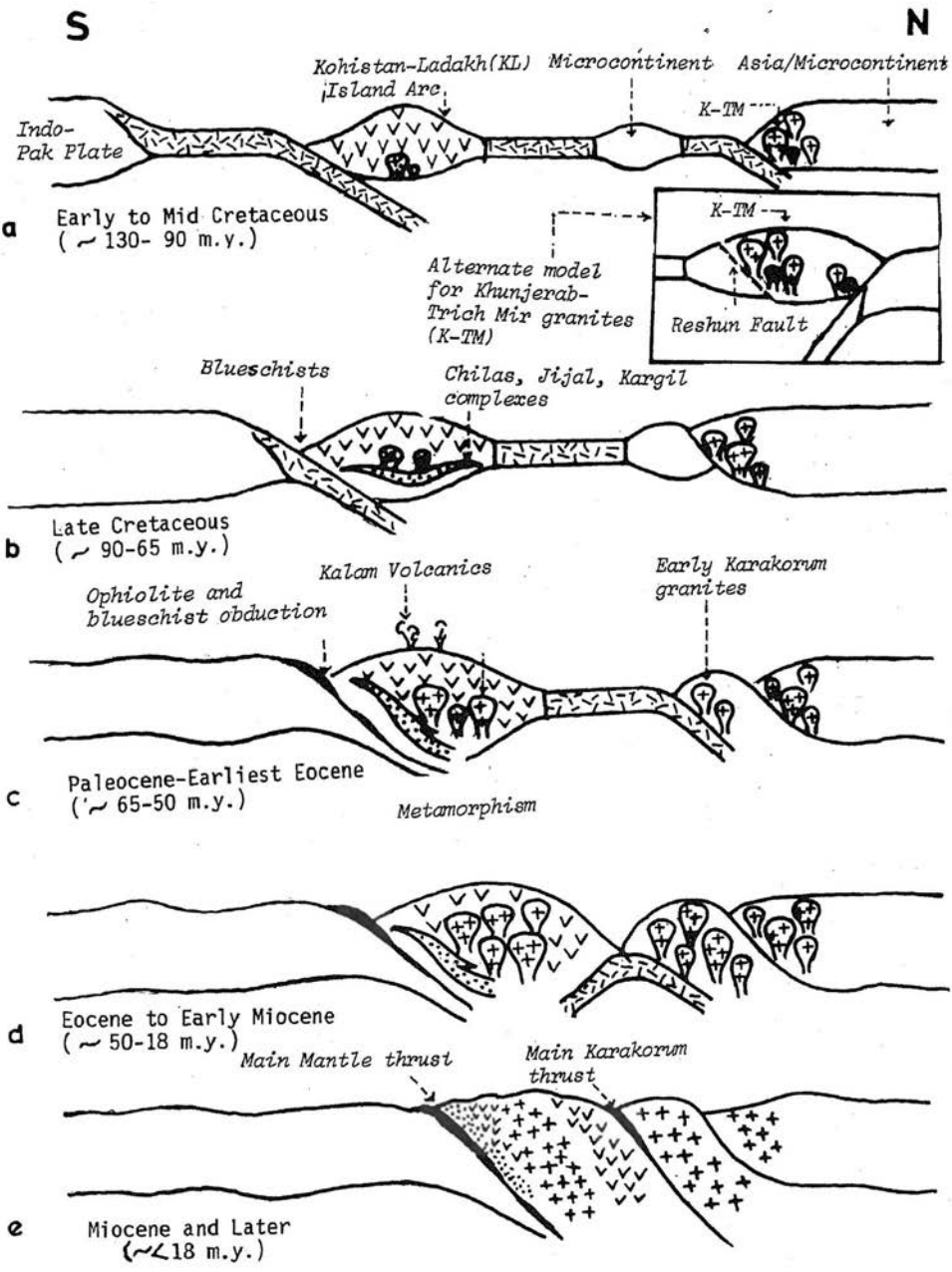

Fig.1. Hypothetical model for the magmatic evolution of NW Himalaya and Karakoram

(Desio, 1979), related to Wakhan and Pamir granites and produced by a S-facing subduction zone further north.

Acknowledgements. A slightly different form of this model was intended to be included in our granite paper cited below. However, in the light of the paper by Andrews-Speed and Brookfield which appeared during the final proof-reading stages of our granite paper, it was decided to present a modified form of the model in a separate paper. We are grateful to Prof. B.F. Windley and Dr. R.D. Lawrence for useful discussions and to Mr. D.C. Rex for making available many unpublished dates on rocks of N. Pakistan. However, we alone are responsible for any shortcomings in this paper.

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