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Comment

Rb-Sr AGES OF GRANITIC ROCKS WITHIN THE LESSER HIMALAYAN NAPPES, KUMAUN, INDIA

(A comment on the paper by J. R. Trivedi, K. Gopalan and K. S. Valdiya, published in the Journal of the Geological Society of India, Vol. 25, No. 10, 1984, pp. 641-654.)

In the introductory part of the paper, the authors have endeavoured to state the present status on the geology of Lesser Himalaya in Kumaun. In this, there are several omissions and commissions some of which are enumerated here. The authors state (p. 641) that more or less no attempts have been made in the past towards a regional synthesis of geological data for Kumaun region, barring the one by Valdiya (1981). We would like to draw their attention towards the publications of Mehdi *et al* (1972); Kumar *et al* (1974); Agarwal and Kumar (1979); Fuchs and Sinha (1978) and Kumar (1979 and 1982).

Though, there is much to comment on the synthesis of Valdiya, we presen here comments on some of the interpretations put forth by him. The geologica map (Fig. 1) is an over-simplification where one fails to identify the 'autochthonous' from the 'Krol-Jaunsar-Berinag' nappes. In the tectonic succession (Table I) all the tectonic units are shown as allochthonous (allochthon and nappes) while they considered the sedimentaries in the inner Lesser Himalaya to be autochthonous (p. 641). The authors have not followed the code of stratigraphic nomenclature when they use the same term Mandhali Formation for two different lithologic successions – the Tejam and the Jaunsar Groups belonging to different lithostratigraphic and tectonic set-up. The Rautgara Formation has been grouped with the Chakrata Formation to constitute the 'Damtha Group'. Nowhere the two formations occur in association. In fact, the Chakrata Formation (=Simla Slates) overlies the Deoban Group in the Tons Valley while the Rautgara forms the basement for the Deoban/Tejam Group.

The paper also refers to the sequence of 'Mussoorie Group' which includes the Blaini-Krol-Tal succession and still considered by the authors as Upper Palaeozoic probably based on the supposed 'discovery' of a lone specimen of *Linoproductus* by Valdiya (1980). This 'discovery' has never been authenticated by reproducibility. Probably, the authors are not aware that of late there has been a great spurt in geological work in the Krol belt which has led to definite late Precambrian to Early Cambrian age to a large part of the sequence based on reproduceable, identifiable and globally well-established guide fossils or fossil groups.

Recent finds of several groups of fossils from upper member of Krol Formation to lower part (Chert-Phosphorite to Calcareous Member) of Tal Formation, involving about 1,000 to 1,500 m of sequence, clearly display positive evidences of an evolutionary trend of life from late Precambrian to Early Cambrian which is in conformity with that observed in similar successions in U.S.S.R., Mongolia, China and elsewhere in the world. Perhaps it may be interesting to mention that brachiopod fauna comparable to that found in the Botomian Stage of Early Cambrian has also been found in the lower part of the Phulchatti Member ('Upper Tal') of Tal

Formation (Tripathi *et al* in press). The elements of marine transgression related to Permian and Cretaceous ages in the area are the Boulder Slate succession of Dogadda and the Shell Limestone respectively.

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Authors' Reply

Kumar and Bhatt feel aggrieved that we have not referred to their works on Kumaun stratigraphy. Our paper was not a review of the work done on the stratigraphy of the Kumaun Himalaya, nor was an attempt at synthesizing deductions of various workers made. The works of G. Kumar and his associates on the inner sedimentary belt of the Lesser Himalaya in the valleys of Bhagirathi, Alaknanda, western and eastern Ramganga, admittedly of considerable merit, are not germane to the central thesis of our paper and hence not referred to. Moreover, the objective of this geochronological study being demonstration of the validity or otherwise of the concepts proposed by Valdiya. The stratigraphic position, subdivision, correlation and lithological composition of various units including the Damtha (with Rautgara and Chakrata Formations) and Tejam (Deobaon and Mandhali Formations) have been dealt at length—without violating the code of stratigraphic nomenclature.

The geological map (Figure 1), intended to show sample-localities, was deliberately made very simple in order to bring out clearly the position and geographic extent of the granite-bearing lithotectonic units. Since the sedimentaries of the autochthonous and parautochthonous units were not the object of our investigation and a subject of discussion, no attempt was made to differentiate or sub-divide them on the map and the section and no analysis of the various findings and deductions on the ages of rock-formations including the Krol and Tal incorporated.

We very much regret an inadvertent error in Table I. At the bottom of the succession the word on the left side should be 'autochthonous', not allochthonous. The Damtha Group with its unconformable mantle belong to the autochthonous unit.

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