

DISCUSSION

Mineral ages of Pegmatites from the Palghat Gap Region in Kerala and their Tectonic Significance

(A comment on the Paper by Soman *et al.*, published in the Journal of the Geological Society of India, Vol. 35. No 1. 1990, pp. 82-86).

Soman *et al.* have suggested that 'the pegmatites were emplaced towards the closing stage of a retrogressive metamorphic event associated with the crustal uplift in the Palghat Gap region'. In this context it is considered that the significance of the ages of the pegmatites (490–510 m.y.) in the Palghat Gap region may be analysed not in isolation but by taking into consideration the ages of a few other igneous emplacements traced along deep crustal fractures in south India, including the Mukkunu pegmatite (462 ± 12 m.y. : Soman *et al.* 1982), the Chengannur granite (550 m.y. : Soman *et al.* 1983), the Ambalavayal granite (505 ± 20 m.y. : Santhosh and Nair, 1983), granite pegmatites from south Kerala (445–475 m. y. : Soman *et al.* 1982), the Ezhimala granophyte (678 m.y. : Nair and Vidhyadharan, 1982), the Wynad pegmatites (739 ± 20 m.y. : Odom, 1982) and the Kalpetta granite (765 ± 20 m.y. : Odom, 1982).

Bond *et al.* (1984), while discussing evidences for the break-up of a supercontinent between 625–555 m.y. ago, have quoted radiometric ages of igneous emplacements from the Middle East and Australia and have suggested that a syn-rift magmatic event was defined between 850 m.y. and 525 m.y. ago (Late Proterozoic-Early Palaeozoic). The dates from south India given above fall within the same span of time. In the picture of the spatial distribution of continents in the Proterozoic supercontinent, reconstructed on the basis of palaeomagnetic data (Pichamuthu, 1985), India lies between Australia and the Middle East. India's position suggests that as in the cases of Australia and the Middle East, the dates from south India may also be indicative of the same syn-rift magmatic event related to the rifting and fragmentation of the Proterozoic supercontinent. Thus the ages of the igneous bodies from south India are suggestive of a tectono-magmatic event of regional dimensions.

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REPLY

We thank Sri. Subramanian for enlarging the scope and significance of the reported age data on a regional scale with implications on continental rifting.

In our paper on Palghat Gap, we tried to restrict ourselves to reporting of the ages, assuming that it will be too much of an exercise on our part to speak of regional tectono-magmatic events and continental rifting based on a couple of K-Ar mineral ages alone. This does not mean that we are not in favour of the late-Proterozoic-early Palaeozoic tectono-magmatic event in south India and elsewhere. Rather, such an idea was aired in a couple of our earlier publications (cf. Soman, 1985; Soman *et al.* 1986), making possible comparison of the metallogenic features of south Kerala, Sri Lanka and Madagascar. Now we are in possession of more convincing U-Pb zircon and monazite ages (under publication) about the incidence of a major ca 520 Ma thermal and igneous episode closely related to the retrogression event in south Kerala. Kroner *et al.* (1987) have postulated a ≈ 550 Ma thermal and igneous event leading to widespread retrogression in the adjacent Sri Lankan high-grade rocks through ion-microprobe dating of zircons. This event has parallels in eastern Africa, and Madagascar also (Kroner, 1980). The variation in ages of the magmatic emplacement phases along spatially different shear zones of southwestern India and elsewhere (850–525 m.y.) may be due to a protracted tectono-magmatic cycle that ultimately resulted in the continental rifting and drifting. As such, significance of the widespread late Proterozoic-early Paleozoic tectono-magmatic event in the tectonic and metamorphic evolution of the contiguous areas of the erstwhile Gondwanaland is being understood in much detail, and Sri. Subramanian's comment has further amplified it.

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