

blages, a metamorphic temperature⁷ of $820 \pm 50^\circ\text{C}$ and pressure⁸ of 7.09 ± 1 kbar is estimated. This value is in conformity with the regional metamorphic temperatures of $840 \pm 70^\circ\text{C}$ obtained for charnockites from Nilgiri Hills^{3,4}.

DISCUSSION

The metamorphic pressure (7.0 Kb) and temperature ($820 + 50^\circ\text{C}$) of the gabbroic anorthosites clearly demonstrates that they have suffered the dominant granulite facies (charnockite forming) metamorphism of 2.6 Ga. The gabbroic anorthosite emplacement must be older than 2.6 Ga and hence pre charnockitic. Thus, they may represent dismembered extensions of the layered ultramafic-gabbro-anorthosite complexes exposed around Bhavani² which are older than 3.0 Ga. Further, their occurrence along the N 60° E trending lineament is significant. This lineament of Archaean age has been reactivated in later times. Recognition of rock types like this and the associated supracrustals in the Nilgiri Hills, particularly along lineaments, will enable one to understand the tectonic uplift history of the Nilgiris.

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1. Vemban, N. A., Subramanian, K. S., Gopalakrishnan, K. and Venkata Rao, V., *Geol. Surv. India, Misc. Publ.*, 1977, **31**, 53.
2. Selvan, T. A., Ph.D., thesis, University of Mysore, 1981, p. 320.
3. Janardhan, A. S., Newton, R. C. and Hansen, E. C., *Contrib. Mineral. Petrol.*, 1982, **79**, 130.
4. Raith, M., Raase, P., Ackermann, D. and Lal, R. K., *Trans. R. Soc. Edin.*, 1983, **73**, 221.
5. Janardhan, A. S. and Leake, B. E., *J. Geol. Soc. India*, 1975, **16**, 391.
6. Janardhan, A. S. and Ramachandra, H. M., *J. Geol. Soc. India*, 1978, **19**, 277.
7. Ellis, D. J. and Green, D. H., *Contrib. Mineral. Petrol.*, 1979, **17**, 13.
8. Perkins, D. and Newton, R. C., *Nature (London)*, 1981, **292**, 144.
9. Vaidyanadhan, R., Ramana Rao, K. L. V. and Pardhasaradhi, Y. J., *J. Geol. Soc. India*, 1971, **12**, 299.

NEWS

RARE METALS FROM WASTES

The Ust-Kamenogorsk lead and zinc works in Kazakhstan produces indium, selenium, thallium, tellurium and other rare metals out of dust (industrial waste).

Scientists have developed the world's first method of recovering rare elements with organic liquid solvents not reacting to a water solution. The process takes couple of minutes. It needs practically no electricity or fuel. The process also improves the environment. Discharges of gases and dust into the atmosphere have decreased tens of times and purified industrial water is recycled.

"The new method boosts production of rare metals", says Akhat Kulenov, works' manager. "We have trebled production of indium, selenium and tellurium and increased 60 per cent the output of thallium. Their quality has improved, thanks to the new method. The process is non-stop and automatically controlled. (*Soviet Features*, Vol. XXV, No. 93, p. 6; The Information Dept., USSR Embassy in India, P.B. 241, 25 Barakhamba Road, New Delhi 110 001).