

appears from the field relationship and from the results of chemical and petrographic studies that the leptynites are merely reconstituted and recrystallised phase of khondalites with certain amount of assimilation of the charnockite material from the intrusive charnockite as suggested by Krishnan¹.

A perusal of the literature available on the Eastern Ghats reveals the occurrence of leptynite along with the paragneiss and charnockite. Murty² in Visakhapatnam, Srirama Rao³ in Kondapalle, Narasinga Rao⁴ in Kondavidu, and Holland⁵, Leelananda Rao⁶, Subramanyam⁷, and others in the type charnockite area, Madras, and many others in their respective areas have noted leptynite at the contact of paragneiss and charnockite. Narasimha Rao⁸ in the Chimakurti area has not reported leptynite, though paragneiss and charnockite come into contact with each other. The two contradicting contingencies of occurrence and absence of leptynite at the contacts of paragneiss and charnockite in both the cases can be explained as follows:

Narasimha Rao⁸ reports the paragneisses and pyroxene granulites as interbedded sedimentary series which were later metamorphosed to the granulite facies. These are intruded by granites converting them respectively into pelitic migmatites and charnockites. He thus adduced a migmatitic origin for the charnockites. In all the other areas mentioned above charnockite has been considered to be of undoubted magmatic origin, though it has been subsequently metamorphosed. It thus becomes clear that magmatic charnockite can alone bring in the reconstitution and recrystallisation of the paragneiss, resulting in leptynite. This observation is made in the Eastern Ghats region. The extent to which this idea is applicable to the charnockite terrains of other regions remains to be seen.

Recently Cooray⁹ advocated that the leptynite is a quartzo-felspathic gneiss that could be metamorphosed semipelite. In most of the granulite facies terrains quartzo-felspathic gneisses accompany paragneiss; both of them exhibit well-developed gneissic texture in contrast to the granoblastic texture of leptynites. Granoblastic texture could be the modification of the gneissic texture during the recrystallisation and reconstitution of the gneiss by magmatic charnockite. The development of an equidimensional fabric at the expense of schistose and gneissic fabric in the rocks that

are affected by later intrusives is not an uncommon phenomenon. Furthermore, it is not known why leptynite is found only in certain regions but not in others, even though meta-pelites and semipelites are found in almost all the granulite facies terrains of the Eastern Ghats. In fact, quartzo-felspathic gneisses are noted in Amaravathi and Chimakurti areas; but leptynites are present in the former area and absent in the latter. The occurrence or non-occurrence of leptynite at the contact of paragneiss and charnockite is purely dependent on the nature of the charnockite. The magmatic, but not migmatitic, charnockite can bring in the reconstitution and recrystallisation of the paragneiss, resulting in leptynite—an observation which was explained earlier. Cooray's⁹ contention that leptynite is a quartzo-felspathic gneiss, but not the reconstituted phase of khondalite does not find support in the present investigation and in the investigations made by several workers in the Eastern Ghats region.

The authors wish to thank Prof. M. G. Chakrapani Naidu, for providing the facilities to carry out this work. One of us (A. R.) acknowledges the financial assistance of the C.S.I.R.

Department of Geology,
S.V.U. College,
Tirupati, January 6, 1972.

A. RAMASWAMY.
M. S. MURTY.

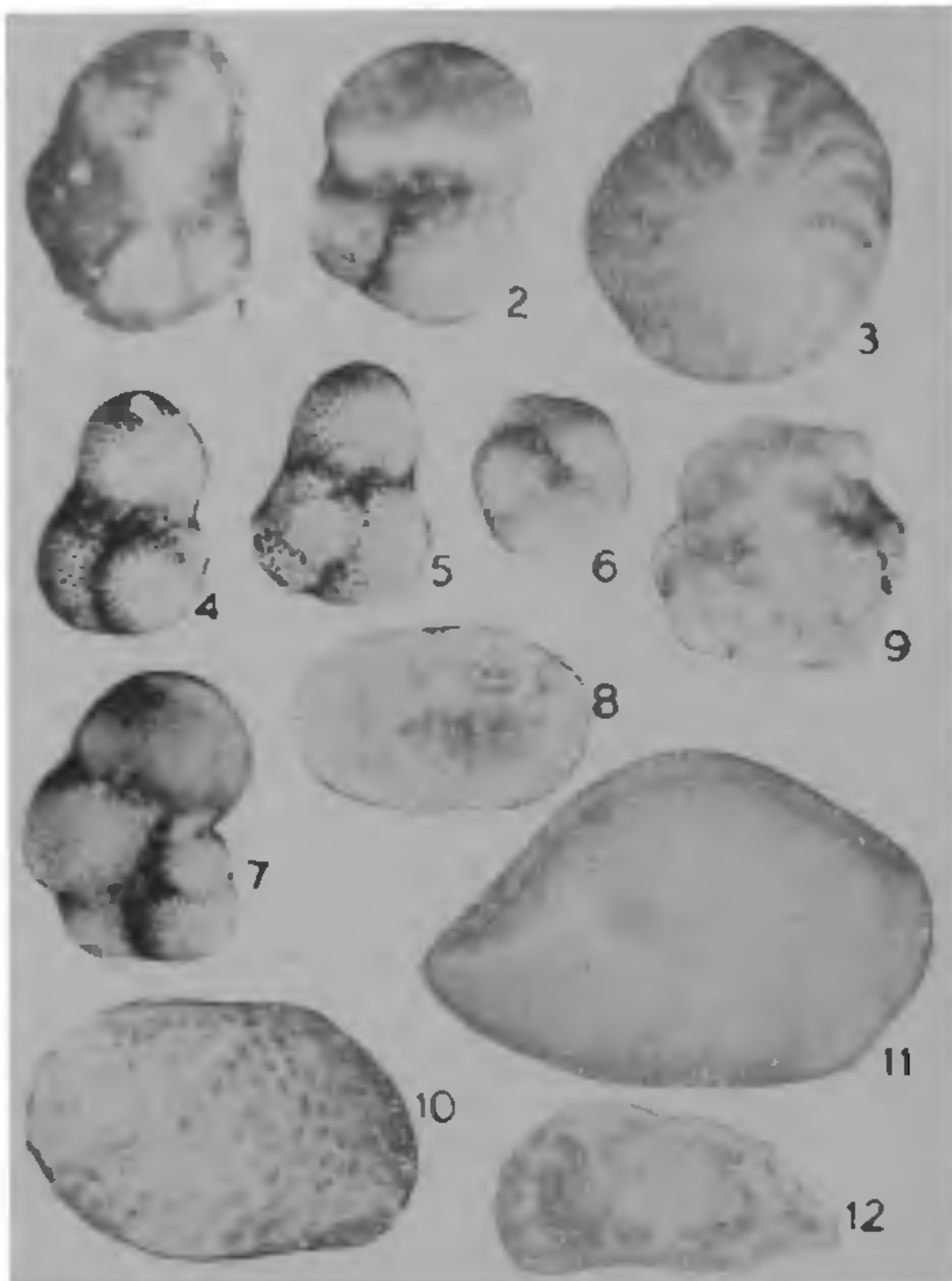
1. Krishnan, M. S., *Ind. Sci. Cong.*, 1947, 3, 141.
2. Murty, M. S., *Unpublished D.Sc. Thesis*, Andhra University, 1961.
3. Srirama Rao, M., *Proc. Ind. Acad. Sci.*, 1946, 24, 1961.
4. Narasinga Rao, A., *Quart. Jour. Geol. Min. Soc. Ind.*, 1950, 22, 71.
5. Holland, T. H., *Mem. Geol. Surv. India*, 1900, 28, 119.
6. Leelananda Rao, N., *Jour. Madras Univ.*, 1956, 26 B (1), 93.
7. Subramanyam, A. P., *Am. Jour. Sci.*, 1959, 257, 321.
8. Narasimha Rao, K. L., *Unpublished Ph.D. Thesis*, S.V. University, 1966.
9. Cooray, P. G., *Am. Jour. Sci.*, 1969, 267, 969.

A NOTE ON THE OSTRACODA AND FORAMINIFERA FROM THE PLIOCENE OF NEILL ISLAND, SOUTH ANDAMAN

THE present study is based on the rock samples of the cream coloured fossiliferous marl collected in 1968 by one of the authors (D. K. K.) from the Neill Island and has been carried out at the University of Lucknow.

The cream coloured marl is exposed in a cliff around the western coast of the island, and has yielded a rich assemblage of ostracoda,

foraminifera and bryozoa. It also contains a few nannofossils. The species of ostracoda identified in the marl are *Bairdia antillea* Bold, *Bairdia* spp., *Pontocypris* sp., *Krithe* spp., *Paracytheridea longicaudata* (Brady), *Hemicythere* sp., *Caudites* sp., *Leguminocythereis* spp., *Loxoconcha* sp., *Loxoconcha honoluliensis*



FIGS. 1-12. Fig. 1. *Globorotalia* (G) *tumida tumida* (Brady), umbilical view, $\times 32$. Fig. 2. *Globigerinoides rubra* (d'Orbigny), umbilical view, showing umbilical primary aperture, $\times 44$. Fig. 3. *Elphidium* sp., side view, $\times 40$. Fig. 4. *Globigerinoides* sp., umbilical view. Fig. 5. Spiral view, $\times 44$. Fig. 6. *Pulleniatina* sp., umbilical view, $\times 24$. Fig. 7. *Hastigerina* sp., side view, $\times 31$. Fig. 8. *Cytherelloidea* sp., left view, of closed carapace, $\times 44$. Fig. 9. *Combatoporeta* sp., side view, $\times 35$. Fig. 10. *Loxoconcha* sp., left view of closed carapace, $\times 41$. Fig. 12. *Caudites* sp., left view of closed carapace, $\times 49$.

(Brady), *Quadracythere* sp., *Hermanites* sp., *Costa boldi* n.sp., *Xestoleberis* spp., *Cytherella* sp., and *Cytherelloidea* sp. The foraminiferal assemblage is represented by *Globorotalia* (*Globorotalia*) *tumida tumida* (Brady), *Globorotalia* spp., *Pseudorotalia gaimardii* (d'Orbigny), *Globigerinoides rubra* (d'Orbigny), *Globigerinoides triloba im-matura* Le Rey, *Globigerinoides* spp., *Orbulina universa* d'Orbigny, *Bolivinita* sp., *Logena* spp., *Nonion* spp., *Florilus* sp., *Eponides* spp., *Quinqueloculina* sp., *Elphidium*

spp., *Pulleniatina* spp., *Bolivina* sp., *Uvigerina* spp., *Siphogenerinoides* spp., *Rectobolivina* sp., *Hastigerina* sp., *Textularia* spp., and *Cympaloporeta* spp. The present foraminiferal assemblage suggests an early Pliocene age to the marl.

Detailed work on ostracoda foraminifera, bryozoa and nannofossils is in progress and the results will be published later on.

The authors are indebted to Dr. R. C. Misra, Professor and Head of the Department of Geology, Lucknow University, for providing facilities and to Dr. W. A. Van den Bold, Professor of Micropalaeontology, Louisiana State University, Baton Rouge, Louisiana, for his kind perusal of the manuscript dealing with ostracoda.

Department of Geology,
University of Lucknow,
Lucknow, December 4, 1971.

PRATAP SINGH.
K. P. VIMAL.
D. K. KULVE.

1. Blow, W. H., *Bull. Am. Palaeontology*, 1959, 39 (178), 67.
2. Bolli, H. M., *U.S. Natl. Mus. Bull.*, 1957, 215, 97.

ON THE OCCURRENCE OF *HYALINELLA MINUTA* OKA (ECTOPROCTA : PHYLAETOLAEMATA) IN INDIAN WATERS

DURING the course of a detailed study of the freshwater Bryozoan fauna of Madhya Pradesh, the authors came across the species *Hyalinella minuta* Oka. This is the first record of the species from Indian waters and is an addition to the earlier records (Annandale, 1911; Rao and Kulshrestha, Rao and Ghosh 1962-64) of freshwater Bryozoan fauna from this region.

H. minuta was recorded from Nageshwar Ghat (St. No. 97) at Badawaha in the Narmada river system. The material was observed as an encrustation on small pieces of submerged sticks. The colony was repent with no erect branches and is quite dense in growth. It is compact with a continuous ectocyst of the older and newly formed zooecia. The latter are small with a swollen soft and colourless ectocyst. The zooecial tip is slightly upright with an obscure emargination and keel. The septa are not visible and the floatoblasts resemble those of *Hyalinella punctata*. No sessoblasts could be recorded. The polyp is comparatively short and stumpy with a prominent funicular tissue, extending from its posterior end. The tentacular number is variable from 25 to 38. The older polyps have a larger number of tentacles than