

e.m.u. The mean direction for all the specimens is  $D = 330^\circ E$ ,  $I = -22^\circ$ .

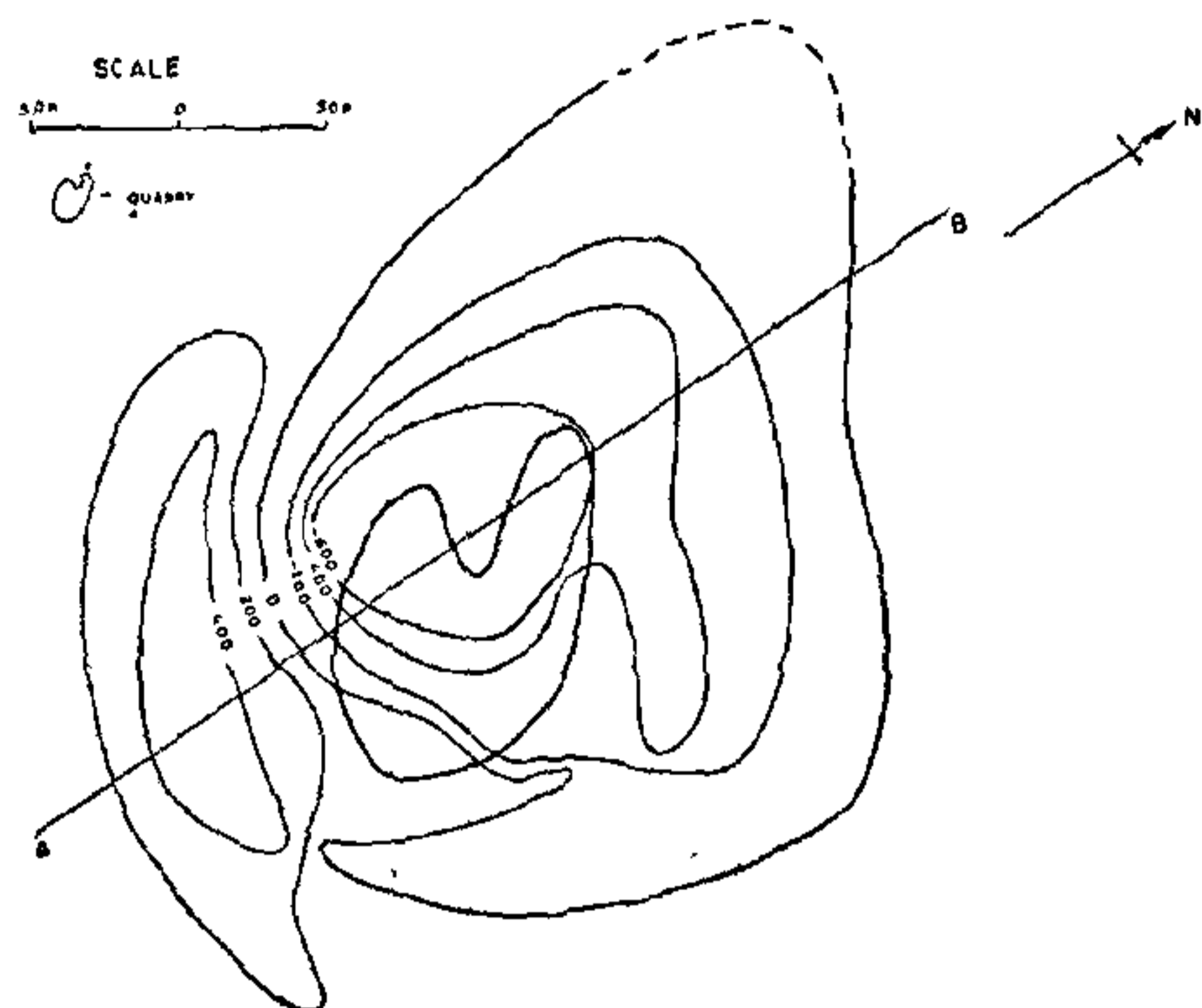


FIG. 1. Vertical magnetic anomaly map.

From the almost circular anomaly pattern in Fig. 1 it appears that the causative body is a localised mass with very limited lateral extent and it may be approximated by a spherical mass. The profile AB (Fig. 2)

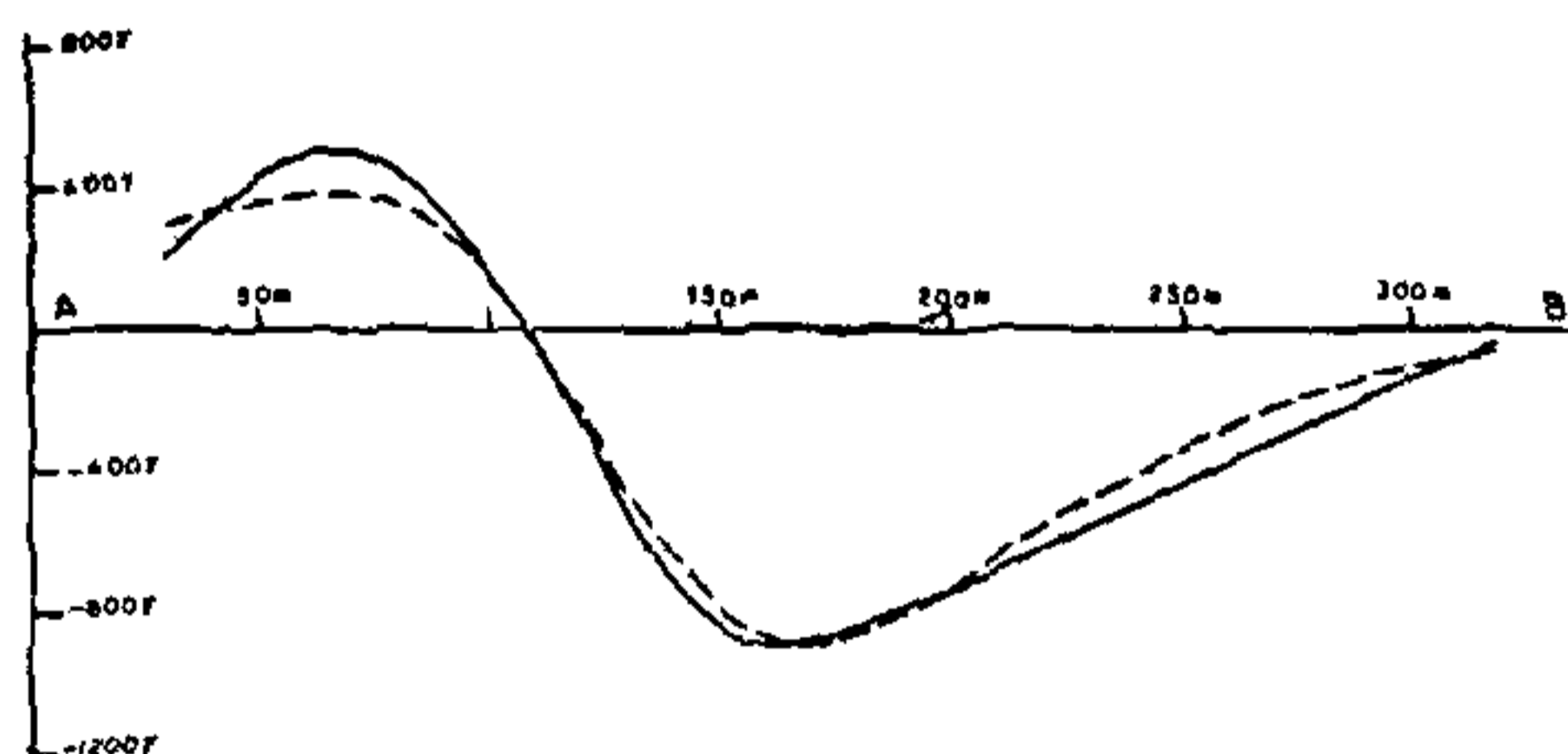


FIG. 2. Profile AB.

is interpreted for the quantitative parameters of the assumed sphere model. Approximate depth to the centre of the mass is obtained from the width of the profile. The depth thus deduced and the magnetic dip ( $-22^\circ$ ), from measurements on specimens, are used in calculating a theoretical vertical magnetic anomaly profile with the usual expression (Telford *et al.*)<sup>1</sup>. The depth is slightly changed until the theoretical curve agrees with the observed anomaly curve and the one shown by a discontinuous line in Fig. 2 is for a depth of 103 metres to the centre and a magnetic dip of  $-22^\circ$ . If the average intensity of measured NRM,  $0.6 \times 10^{-3}$  e.m.u., is used for deducing the radius, it comes to 106 metres exceeding the depth by only 3 metres. A slightly stronger intensity,  $0.65 \times 10^{-3}$  e.m.u., will remove this discrepancy.

The northward dominant negative closure and the close match between the observed anomaly curve

and the theoretical curve indicate that the magnetic anomalies are predominantly controlled by the NRM. Thus, the results suggest the charnockite mass to be having limited lateral extent, possibly a stock type intrusive, whose magnetisation is dominantly remanent.

Department of  
Geophysics,  
Andhra University,  
Visakhapatnam 530 003,  
April 19, 1980.

V. BHASKARA RAO.  
A. LAKSHMIPATI RAJU.

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### FOSSIL WOOD OF *ANISOPTERA* FROM THE MIOCENE BEDS OF BIRBHUM DISTRICT, WEST BENGAL INDIA

In the present note, a new fossil wood resembling the modern genus *Anisoptera* korth is described from the Miocene beds of Santiniketan ( $23.42' N$ ,  $87.42' E$ ) near Bolpur, Birbhum District, West Bengal. The present fossil wood is represented by a single specimen of secondary wood about 6 cm in length and 3 cm in diameter. The preservation is quite satisfactory. It shows the following characters.

*Wood* diffuse—porous (Fig. 1). *Growth rings* absent. *Vessels* small to large sized, t.d.  $166-266 \mu$ , r.d.  $133-499 \mu$ , exclusively solitary (Fig. 1); 6–12 per sq. mm.; heavily occluded with tyloses; vessel members usually long; perforation plate simple with truncate ends; pits to vessel not seen. *Tracheids* vasicentric. *Parenchyma* paratracheal and apotracheal; *Paratracheal* parenchyma scanty to vasicentric, apotracheal parenchyma diffuse. *Xylem rays* fine to moderately broad (Fig. 2), 1–5 (mostly 4–5) cells and 15 to  $80 \mu$  broad; 6–12 per mm, uniseriate rays 3–12 cells and  $159-333 \mu$  high, multiseriate rays 12 to 52 cells and  $166$  to  $999 \mu$  high; rays heterocellular (Kribs type 11A) consisting of procumbent cells in the middle thickened portion with 1–6 marginal upright cells at one or both the ends (Fig. 3), sheath cells present on the flanks of the rays. *Fibres* irregularly arranged in between two consecutive xylem rays, thick-walled, libriform, non-septate,  $15-30 \mu$  in diameter. *Gum canals* diffuse, normal, vertical, exclusively solitary, scanty and small in size,  $66-133 \mu$  in diameter.

- Holotype* No. — P<sub>13</sub>, of the Palaeobotanical collection, Department of Botany, Burdwan University, Burdwan.
- Locality* — Santiniketan, Birbhum District, West Bengal, India.
- Age* — Miocene.

In having characteristic features such as solitary vessels, vasicentric tracheids, multiseriate heterocellular xylem rays with prominent sheath cells and the presence of normal, vertical solitary gum canals, the present fossil wood resembles the modern wood of *Anisoptera*<sup>1</sup> korth of the family Dipterocarpaceae. It also shows resemblance in gross features with the genus *Dipterocarpus* of the same family. But *Dipterocarpus*<sup>7</sup> differs from the fossil wood in having gum



FIGS. 1-3. *Anisopteroxylon santineketanense* sp. nov.  
Fig. 1. Cross section of the fossil wood showing the nature and distribution of vessels and gum canals  $\times 50$ .  
Fig. 2. Tangential section showing the nature and distribution of xylem rays  $\times 80$ . Fig. 3 Radial section showing the heterocellular xylem rays  $\times 100$

canals mostly in short, tangential rows of 2-8 or more and the xylem rays have less sheath cells at the flanks. The present fossil wood is, therefore, placed in the genus *Anisopteroxylon* Ghosh and Kazmi<sup>3</sup>.

So far, only a few species of *Anisopteroxylon* are known. The present fossil wood differs from *Anisopteroxylon bengalensis*<sup>3</sup>, *A. jawalamukhi*<sup>2</sup>, *A. coromandelense*<sup>4</sup>, *A. garoense*<sup>6</sup> in having smaller vessels and narrower xylem rays (4-5) seriate. It also differs from *A. jawalamukhi*, *A. coromandelense* and *A. garoense* in having exclusively solitary gum canals. The gum canals of the present fossil wood are larger than *A. coromandelense* but smaller than *A. bengalensis* and *A. jawalamukhi*. However, the species *Anisopteroxylon kalagarhensis*<sup>5</sup> is closely comparable with the present fossil wood in many features. But the present species is distinguishable from *A. kalagarhensis* in having exclusively solitary vessels and gum canals, only diffuse parenchyma and short xylem rays.

As the present fossil wood differs from all the known species of *Anisopteroxylon* it has been specifically named as *Anisopteroxylon santineketanense* sp. nov., the specific name indicating its place of occurrence in the vicinity of Santineketan, West Bengal.

The genus *Anisoptera* korth consists of about 13 species<sup>8</sup>, which are distributed from Chittagong in Bangla Desh to New Guinea in the Pacific. No *Anisoptera* now grows in India proper.

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Palaeobotany Laboratory,  
Department of Botany,  
Burdwan University,  
Burdwan 713 104, West Bengal,  
India, February 22, 1980.

P. K. GHOSH.  
S. K. ROY.

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