

pings and intercalations and by leaching of calcareous matter. This still is a part of a characteristic pediplain. Interpediment gullies naturally flow down the pediment and are moderately spaced around Coimbatore. The subtrrellised pattern of drainage here is due to the attitude of the steeply dipping gneisses and schistose rocks of the Precambrians in an east-west direction. The drainage density, or the length of streams of all orders put together per square mile, comes to 5+ and this reflects the texture of the terrain.²

Topographic profiles on the rocky pediment from six localities selected at random, 10 to 15 miles NNW of Coimbatore (Toposheet 58 A/16), have been statistically analysed. The lithology of these areas varies from granitic to schistose in nature. The profiles were taken in a direction parallel to the line of the adjacent piedmont angle and moving north from their respective points of origin. This generally happens to cross the interpediment gullies. The inclinations of the pediment are noted with an abney level for every 50' and the fractions rounded to the nearest quarter of a degree. In all, thirty readings of the ground inclination are so recorded (Table I).

TABLE I

	Concave (-ve)	Convex (+ve)	Total
No. of observations ..	17	12	30 (one horizontal)
Average of inclinations	2° 34'	2° 54'	2° 56'
Standard deviation ..	1° 23'	1° 35'	1° 28'

It follows from this study that the convexities and concavities are fairly equally distributed over the rocky pediment in a section parallel to the piedmont angle. The average angle at which the pediment undulates is 2½°. But this is likely to be affected by the spacing of the interpediment gullies or the texture of the terrain. The distance of the pediment surveyed from the backing hillface may also affect the amount of inclinations of the pediment. In the present case, the areas selected are from 250 yards to about 3,500 yards from the backing hill faces.

These observations have a bearing on the present concepts over the pediment evolution in different directions, particularly across the interpediment gullies. Normal to the interpediment gullies, the rocky pediment exhibits a multiconcave to rolling topography. The nature of topography, however, is dependent upon the drainage density. The wider the

streams are spaced, the more planned is the rocky pediment. But the tendency appears to be towards a planar surface by the reduction of the land between successive interpediment gullies. Main pediment formation may be due to the retreat of scarp. But the reduction and planing of the pediment itself is effectively related to fluvial processes and mass-movement. This perhaps explains the observed absence of any significant relation between the length of a pediment, drainage area above a pediment and the lithology of the pediment area over the pediment angle.³⁻⁵

The financial assistance of the Council of Scientific and Industrial Research to one of the authors (Y. J. P.) is thankfully acknowledged.

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ON THE OCCURRENCE OF PLANT REMAINS IN THE PHYLLITES OF BHIKIASAIN AREA, ALMORA DISTRICT, UTTAR PRADESH

PHYLLITES, mica schists and quartzites occurring in the Bhikiasain area of Almora District, Uttar Pradesh, constitute a part of the Krol nappe system of the Lesser Himalaya. During the course of detailed study of these rocks, the writers noticed the presence of fragmentary plant remains. This discovery may be of considerable significance since the rocks of the Krol nappe system are considered to be unfossiliferous and their age is a matter of dispute.

Fresh phyllite chips were macerated in hydrofluoric acid taking all possible precautions against laboratory contamination. The residue, after washing with distilled water, was mounted in glycerine jelly. On examination under a microscope plant remains, of reddish-brown colour, were observed. These include:

- (i) Tracheids with vested bordered pits, round, 17 μ diameter; orifice elliptical, 6 × 3 μ, inclined; 4-5 pits in cross field (Fig. 1, A),

- (ii) Tracheids with simple bordered pits, round, 15μ diameter; orifice elliptical, $10 \times 3\mu$, vertical; 2 pits in cross field (Fig. 1, B).
- (iii) Cuticles with polygonal cells, 7μ across, some of which are thickened (Fig. 1, C).

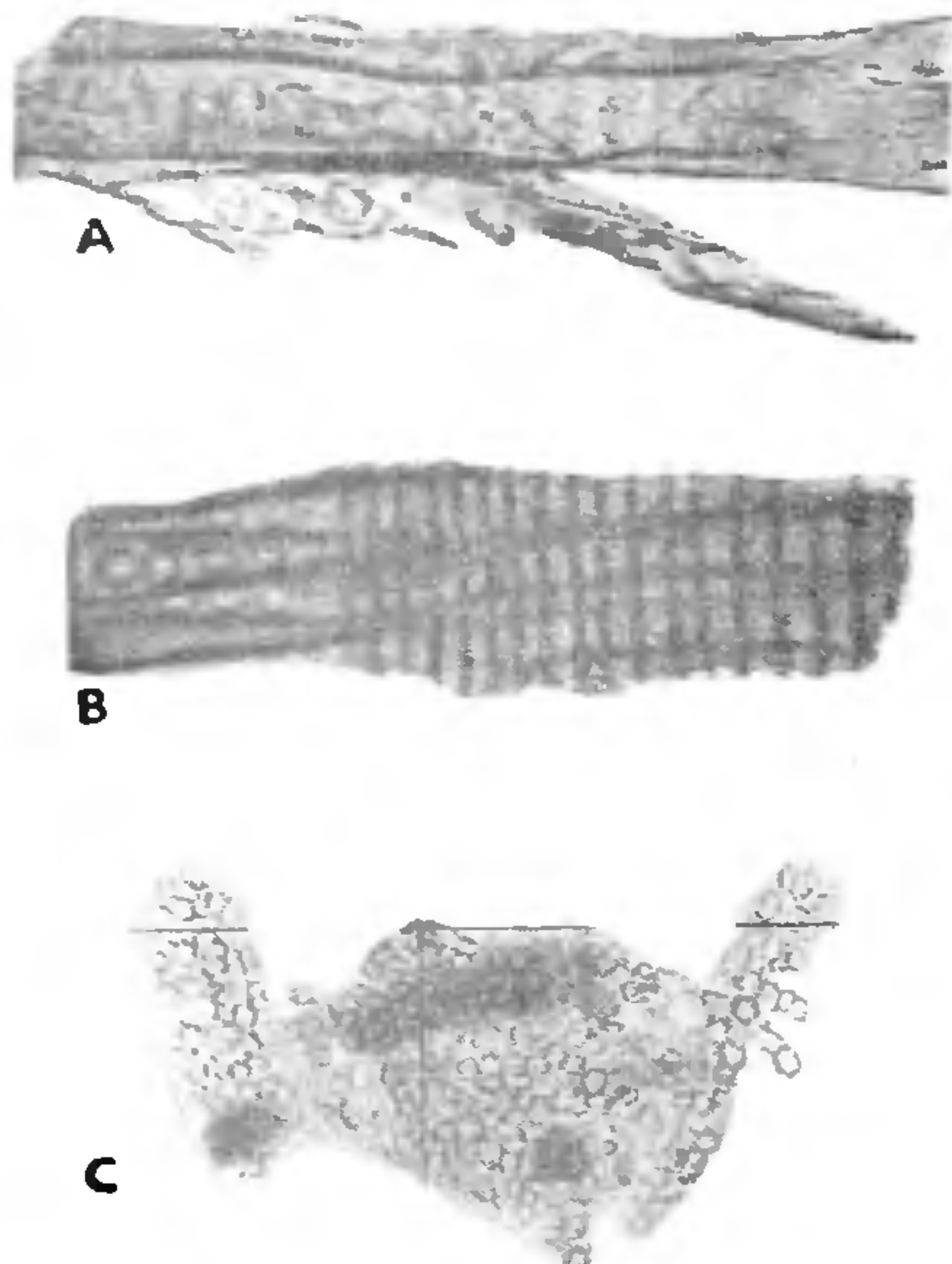


FIG. 1. A-C. Plant remains from phyllites of Bhikiasain area.

The general characters suggest that the remains are of gymnospermous wood.

On the basis of lithology and stratigraphic position, the rock units of Bhikiasain area can be correlated with Jausar¹ formation, the age of which is problematical. Auden² considers it to be Cambrian-Devonian. Gansser,³ in his stratigraphical column, has placed the Jausars in the Ordovician while Boileau⁴ considers them to be Precambrian to Lower Cambrian. Valdiya⁵ correlates the Jausar and Nagthat formations with the Alwar and Bijawar formations of Peninsular India which are usually regarded to be of Precambrian age. In this context, the present discovery of plant remains is significant. Gymnosperms are generally considered to have evolved during the Upper Devonian. This suggests a younger age for the Jausars, i.e., Upper-or Post-Devonian. Detailed investigations, which are underway at the University of Poona, may throw further light on the subject.

The writers are indebted to Prof. B. G. Deshpande for his constant encouragement and for critically going through the paper. They are thankful to Shri A. V. Phadke for taking the photomicrographs. The senior author gratefully acknowledges the financial assistance received, for fieldwork, from the Wadia Institute of Himalayan Geology, Delhi.

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AN AMPHISTOME CERCARIA FROM *GYRAULUS EUPHRATICUS* (MOUSSON)

NATURAL infection with *Cercariae indicae* XXIX in this snail constitutes the only report of an amphistome cercaria under the "Pigmentata" group,² though experimental infection of *Gyraulus convexiusculus* with cercaria of *Gastrothylax crumenifer* has been reported.⁴ Two other types, *Cercaria chungathi* and *C. gyraulusi*, from *G. convexiusculus* have also been described.¹

Numerous specimens of *G. euphraticus* were collected during October, 1969, through December, 1969, from the ponds at Raya and Bhainsa about 13 kilometres from the college premises. These were individually kept under sunlight, between 9-12 a.m., in beakers half-filled with tap-water for observing the emergence of the cercariae harboured by them. Among the trematode larvae found to emerge, the amphistome cercariae were studied in slide preparations of the live specimens. One type of amphistome cercariae available represented the "pigmentata" group. With an extremely low incidence, 12 specimens of larvae form were available for morphological study including the excretory system. The process of encystment was also observed. A brief account of cercaria and metacercaria has been attempted. Feeding experiment was not possible due to inadequate material.

The cercaria, 0.470×0.380 mm size and with 0.353 mm long tail, lacked pigmentation and had oral sucker of 0.029 mm diameter; 0.094 mm long oesophagus; short intestinal and 2.4μ breadth. The pathogen was identified