

comprising of gastropods, inarticulate brachiopods, hyolithelmenthids, annelids, poriferiids, protoconodonts and a host of problematica. Their potential for the delineation of Precambrian/Cambrian transition beds that manifest a global phosphate event and the definition of a pre-trilobitic Cambrian system has been established in recent years<sup>1-5</sup>.

In the context of the Himalayan sequence, the long vexed problem of chronostratigraphy of the Krol-Tal sequence of Lesser Himalaya has now found an acceptable solution<sup>6,7</sup>, based initially on the recognition of small shelly fossils in the basal Tal sequence in the Mussoorie Syncline<sup>8,9</sup>. Here we report the presence of small shelly fossils in the relatively less studied, southeastern extremity of the Krol Belt sequence, exposed in the Nainital Syncline.

The litho-column measured and investigated for the microfauna is located 7 km from Nainital on the Nainital-Kaladhungi road, near the village Chorkhet (29° 23' N: 79° 26' E), and forms cliff section in the road-cut (Figure 1). In this clearly exposed and easily accessible section, the massive bedded dolomites of Upper Krol (Krol E of Fuchs and Sinha<sup>10</sup> = Sherwood Member of Valdiya<sup>11</sup>) are observed to be gradationally and conformably overlain by a sequence of pyriteferous dark grey to black shale/slate and dolomite interbeds (Krol F of Fuchs and Sinha<sup>10</sup> = Giwalikhet Member of

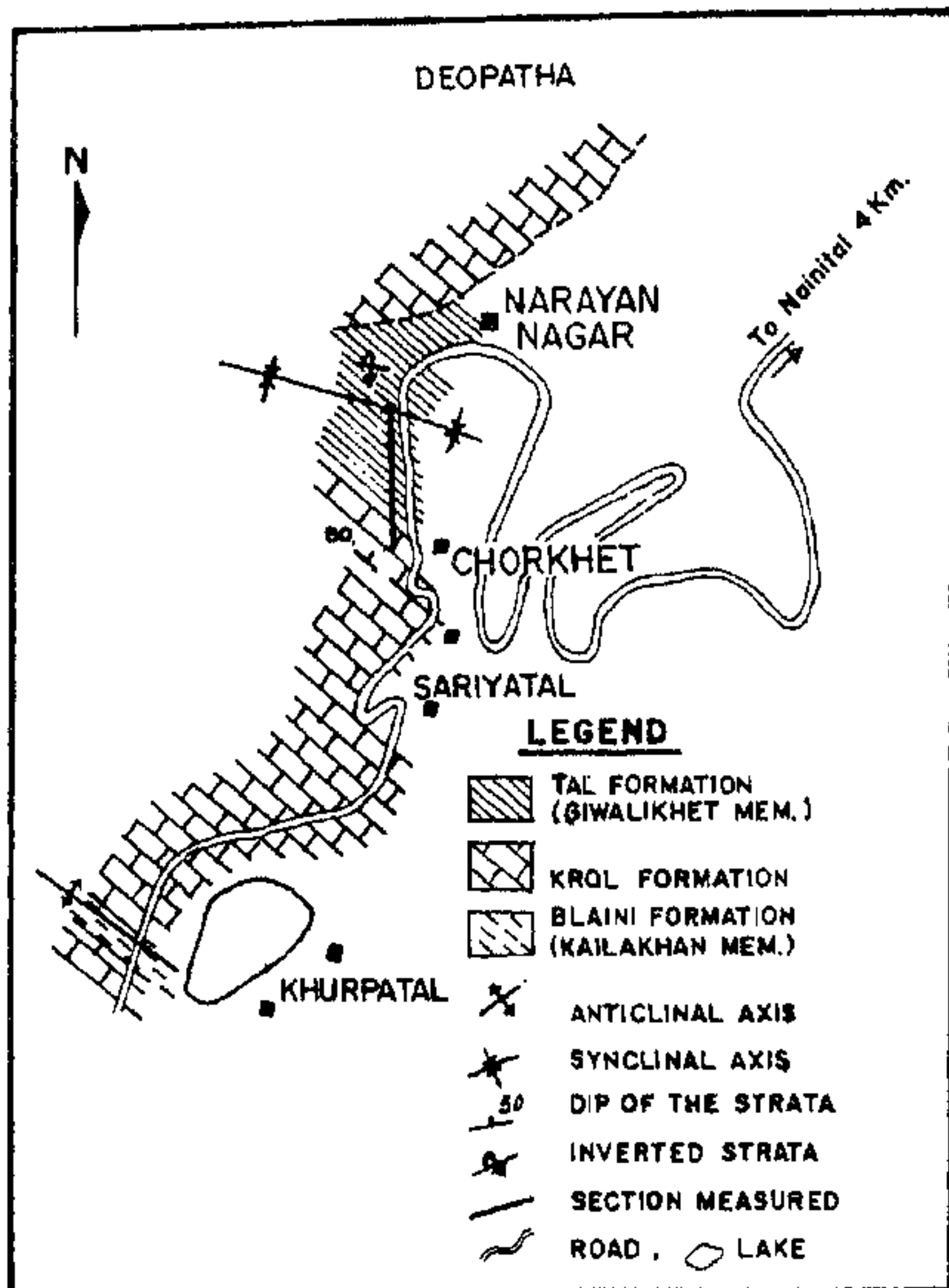


Figure 1. Geological map and section-line of the measured section, Nainital Syncline.

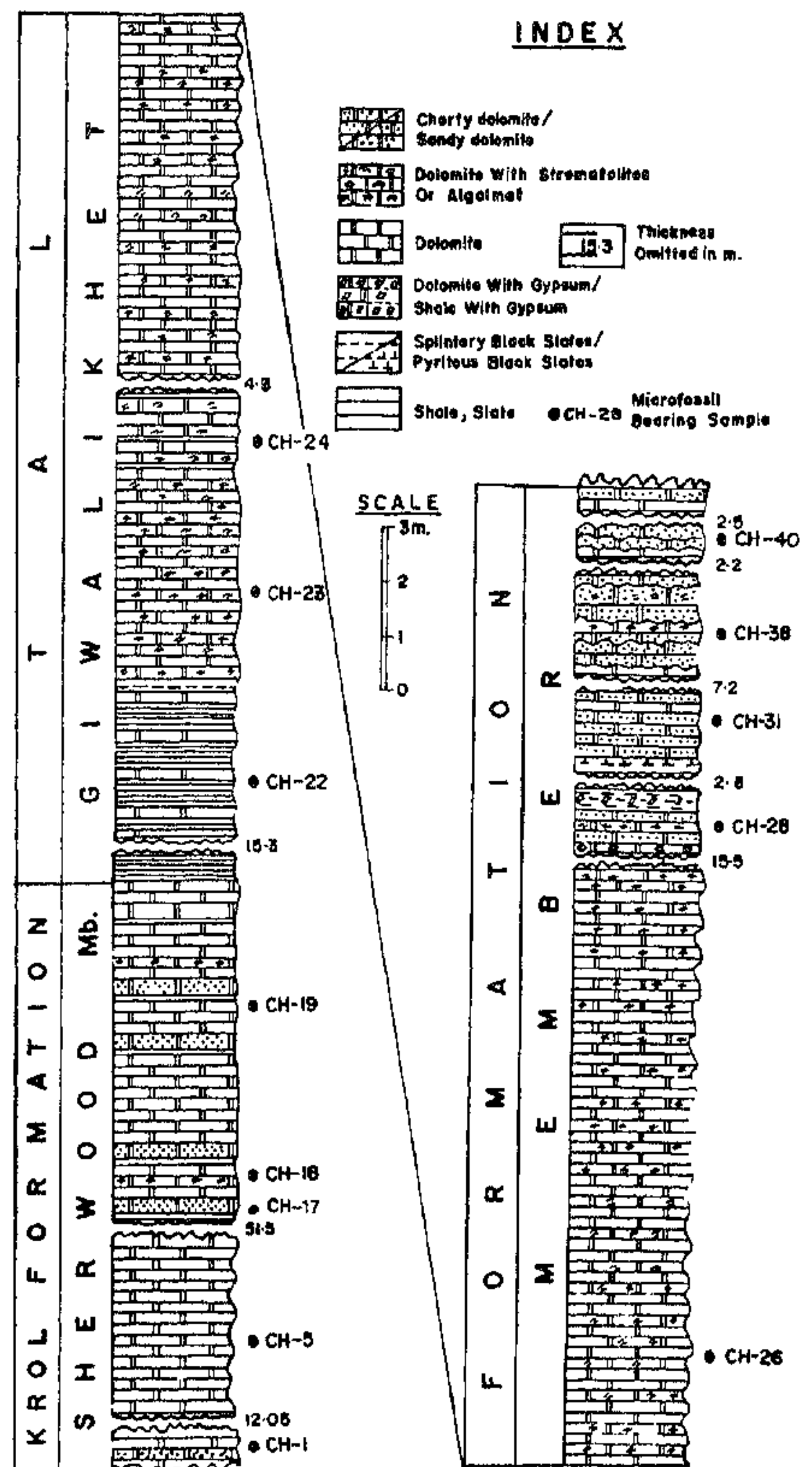


Figure 2. Details of the stratigraphic column measured and microfaunally investigated in the Nainital Syncline, exposed along the Nainital-Kaladhungi road, near Chorkhet.

Tal Formation of Valdiya<sup>11</sup>; Figure 2). The Krol-Tal transition sequence in the Nainital Syncline is phosphate bearing<sup>12-14</sup> and contains a profusion of algal mat-bearing dolomites and occasional layers of laterally linked hemisphaeroidal stromatolites. There is a definite shift in facies at the end of Sherwood Member (of Krol Formation); however there does not appear to be any recognizable sedimentational break with the overlying Giwalikhet Member (of Tal Formation).

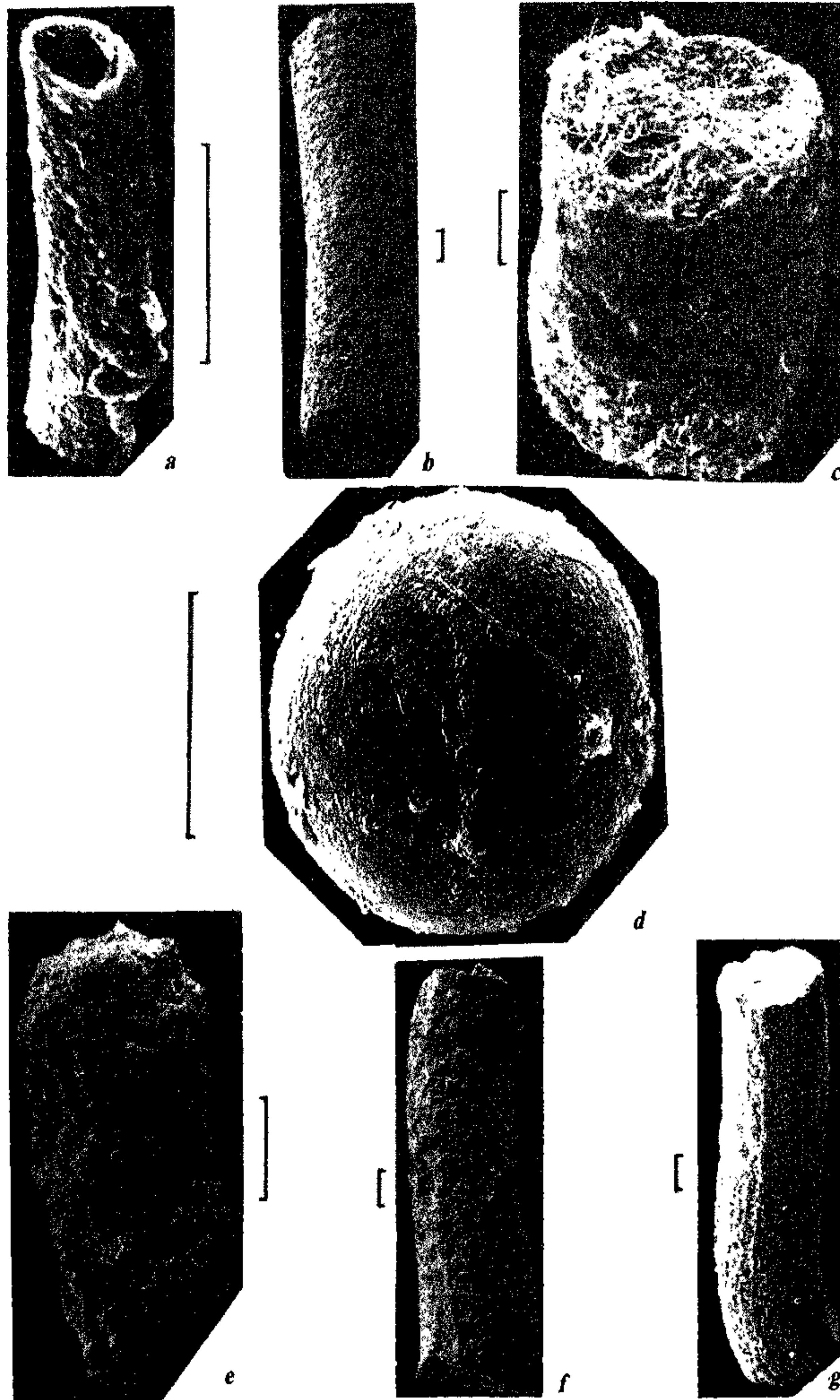
A total of 150 m thick section is reported in this study, of which the lower 77 m includes the top part of the Sherwood Member and the rest 73 m falls in the overlying Giwalikhet Member. Nineteen samples from the Sherwood Member and 24 samples from the Giwalikhet Member were examined microscopically after preparation with the usual acetic acid treatment.

## RESEARCH COMMUNICATIONS

Only the fossil-yielding samples are marked in the figure (Figure 2).

Small shelly fossils are noticed throughout the section. Only phosphatic dolomite horizons were examined for microfaunal yield at the first instance, for it is well-established globally that in addition to the bedded

phosphates<sup>15</sup> like in China<sup>2</sup>, the small shelly fossils have good facies association with phosphatic limestone/dolomite in the terminal Proterozoic and basal Phanerozoic sequences<sup>3</sup>. The small shelly fossil yield from the Nainital Syncline includes *Coleoloides typicalis* Walcott, *Olivoides multisulcatus* Qian, ?*Hyolithellus*



**Figure 3.** *a*, ?*Turcutheca* sp., PRF/5994B; *b*, ?*Hyolithellus* sp., PRF/5982; *c* and *e*, Steinkern fragments of suspected tubular or conoidal shelled organisms, PRF/5994C & PRF/5994D; *d*, *Olivoides multisulcatus* Qian, PRF/5994A; *f* and *g*, *Coleoloides typicalis* Walcott, PRF/5978 & PRF/6017; bar scale represents 0.1 mm; catalogue numbers pertain to the repository of the Palaeontology Division, Northern Region, GSI.