The diagenetic history of the Limestone Member points out that during diagenesis calcite precipitation took place, manifested by the presence of replacement of quartz by calcite and presence of calcite veins cross-cutting the rock (Fig. 4). There are no evidences of a

FIG. 4. Micro-photograph of the Limestone Member. Large quartz grains, oolites and intraclasts are seen. Sparry calcite makes the cement (*a*). Borders of the quartz grains are eaten up by calcite. Veins of sparry calcite cut across all the elements (*b*). Magnification, × 25.

silica precipitation. Thus, the occurrence of quartz grains with secondary overgrowth in the Limestone Member indicates that they must have been derived from a sedimentary source in the vicinity, as the minute overgrowth cannot sustain a long transport. The similarity in the characteristics of the quartz grains of the Quartzite and Limestone Members suggests that the quartz grains with secondary overgrowth in the Limestone Member are derived from the underlying Quartzite Member. This observation demands that the Quartzite Member was lithified and secondary overgrowth around quartz grains was developed before the commencement of the deposition of the Limestone Member. Thus, a hiatus (unconformity) between the Quartzite and Limestone Members is inferred with certainty.

The recognition of a hiatus between Quartzite and Limestone Members has wider implications in the stratigraphy of the Krol belt sediments and sedimentation history of Himalaya. The Limestone Member of the Nilkanth section has yielded Cretaceous fossils; while the Quartzite Member and the sediments below it are totally unfossiliferous[7]. Moreover, on the basis of the Cretaceous age of the Limestone Member, the underlying sediments have been assigned a presumed Cretaceous-Jurassic age[2]. However, in the light of above observations the shell limestone (Limestone Member) cannot be taken an integral part of the underlying unfossiliferous Tal Formation. The Quartzite Member and the underlying sediments might have a different age than the Limestone Member, ranging anywhere from Precambrian to Jurassic. However, for reasons discussed elsewhere present author prefers a Precambrian age for the Quartzite Member and the underlying sediments[4,5].

Senckenberg-Institut, INDRA BIR SINGH.
2940 Wilhelmshaven,
W. Germany, *July* 12, 1978.

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DISCOVERY OF SOME CHAROPHYTA FROM THE FOSSILIFEROUS INFRATRAPPEAN BEDS OF LALITPUR, UTTAR PRADESH

THIS note records the occurrence of fossil charophytes from the fossiliferous infratrappean beds, exposed at about 3 km NNE of Papro village (78° 48′ 20″ : 24° 14′), Lalitpur District Uttar Pradesh, for the first time.

Near Papro (*loc. cit.*) the fossiliferous succession of infratrappean is seen in the two nullah cuttings. The Infratrappean Beds are represented by conglomerate, silicified tuffs and Pitchstone. Fossiliferous silicified tuffs are about 1 to 2 metres in thickness. These beds are seen underlying Deccan Traps and are unconformably overlying the Kaimur Sandstone (Upper Vindhyan) (Table I).

TABLE I

Deccan Trap		Dark greenish black basalt
Infratrappean	Pitchstone	3 m
	Silicified Tuff	1–2 m
	Conglomerate	2–3 m
.....	Unconformity	.....
Kaimur Sandstone		Light brown, subordinate siltstone

Well-preserved specimens of charopyte gyrogonites have been exclusively recovered from ash-grey black silicified tuff by simple maceration method. Some gastropod shells and ostracods have also been recorded. Silicification has resulted in complete replacement of gastroped shells and other micro-organisms by silica.

The charophytic assemblage consists of perfectly preserved gyrogonites, having no vegetative parts. This flora includes 4 genera referable to 5 species, out of which two are believed to be new. A check list of these gyrogonites is given below :—

1. *Chara lalitpurensis* Singh
2. *Chara bitruncata* (Ried and Groves)
3. *Grambastichara tornata* (Ried and Groves)
4. *Gyrogona bundelkhandensis* Singh
5. *Gyrogona coelata* (Ried and Groves)
6. *Microchara* sp.

Chara bitruncata (Ried and Groves) is being recorded for the first time from the Indian subcontinent. From among the species mentioned in the check list *Gyrogona coelata* (Ried and Gorves), *Grambastichara toranta* (Ried and Groves) and *Microchara* sp. have already been reported from other localities of India. Rao and Rao[1] reported *Gyrogona coelata* (Ried and Groves) as *Chara coelata* from Rajamundry. While Tewari and Sharma[2,3] compared a form with *Grambastichara tornata* (Ried and Groves) from Wakka River formation (Oligo-Miocene) Kargil, Ladakh. Genus *Microchara* has been reported from Deccan Intertrappean beds near Nagpur by Bhatia and Mannikeri[4]. These forms have been reported from Tertiary formations of India and England. However, none of these gyrogonites are pre-tertiary in age.

The evidence of the present charophytic flora suggests age of these beds to range from Maestrichtian to Upper Eocene. Authors are, however, inclined to favour Lower Eocene age for these beds.

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Geology Department,
Lucknow University,
Lucknow 226 007,
August 14, 1978.

M. P. SINGH,
D. K. MATHUR.

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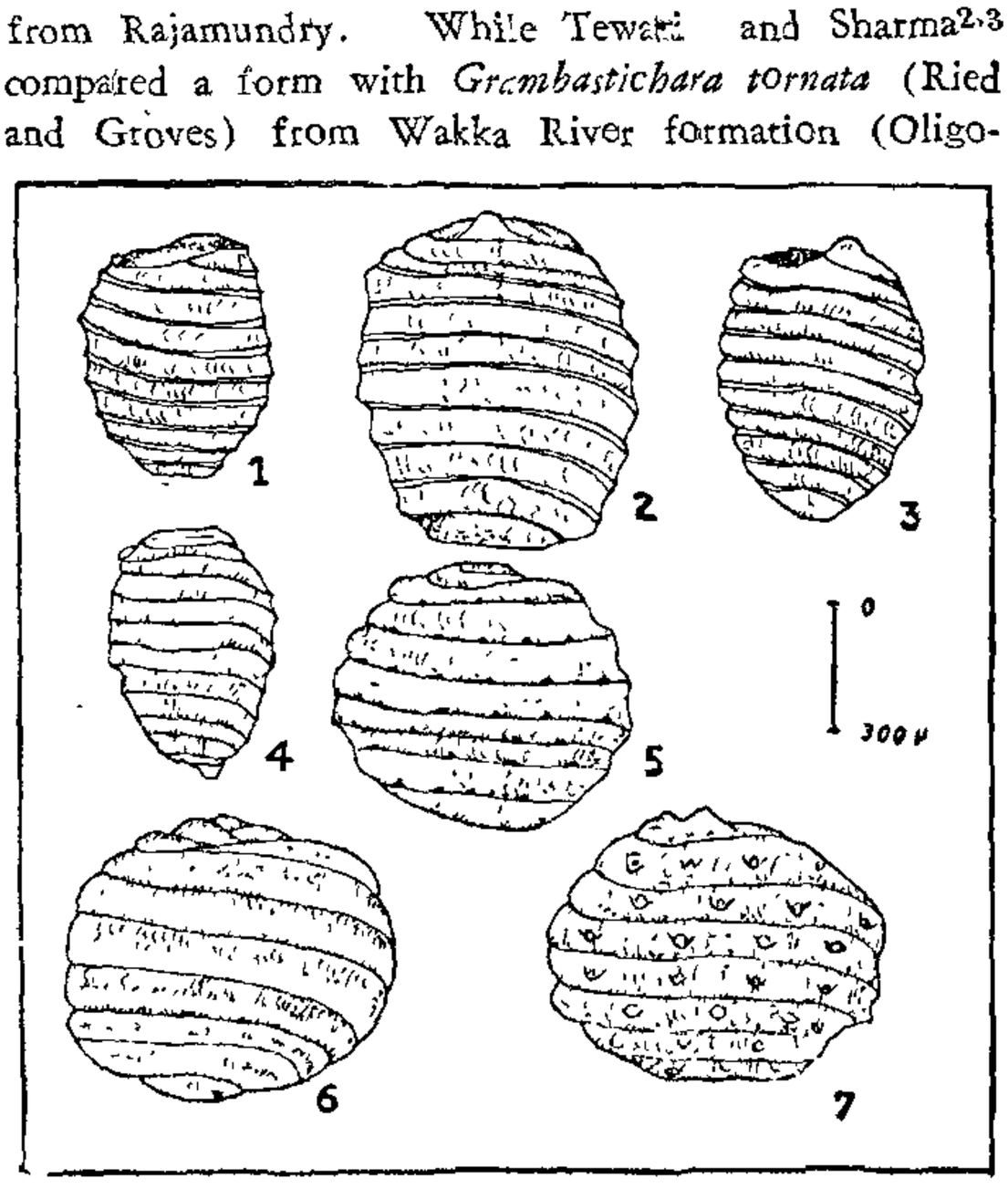

FIGS. 1–7. Fig. 1. *Chara lalitpurensis* Singh, × 32; Fig. 2. *Chara bitruncata* (Ried and Groves), × 59; Fig. 3. *Grambastichara tornata* (Ried and Groves), × 32; Fig. 4. *Microchara* sp., × 32; Fig. 5. *Gyrogona coelata* (Ried and Groves), × 32; Fig. 6. *Gyrogona bundelkhandensis* Singh, × 32; Fig. 7. *Gyrogona coelata* (Ried and Groves, × 32.

DISCOVERY OF MICRO-ORGANISMS FROM THE BEDDED CHERTS OF THE DEOBAN LIMESTONE (LATE PRECAMBRIAN), LESSER HIMALAYA, UTTAR PRADESH

THE present note reports the discovery of micro-organisms from the Deoban Limestone of the sedimentary succession of northwestern part of Uttar Pradesh. The specimens which have yielded microfossils were collected from a place about 1 km from the Deoban Forest Rest House on the Deoban–Chakrata mule track, Chakrata area. The Deoban Limestone is an important lithostratigraphic formation of the sedimentaries of the Chakrata region and has been assigned Middle to Upper Riphean age on the basis of the presence of *Baicalia baicalica* and ? *Jurasavia*[1]. The present micro-organisms are represented both by the spheroidal as well as filamentous forms. Most of the spheroidal forms show presence of eccentrically situated opaque mass. These forms are comparable with similar forms described from the Bitter Springs, the Gunflint and the Belcher Island microfloral assemblages.

The micro-organisms have been observed in thin sections of the black chert which occur as lenses and thin layers in the limestones. These limestones belong to the upper part of the Deoban Limestone formation exposed at Deoban Hill. This succession is predominantly oolitic and at places even pisolites are also