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FOSSIL MOLLUSCA FROM THE SIWALIKS OF EASTERN NEPAL

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FOSSIL animals from the Miocene to early Pleistocene Siwaliks of southern Nepal have been formally reported only by Sharma[1] and informally in several Nepal Geological Survey unpublished papers. Aside from the mandible of a primitive hippopotamus, *Hexaprotodon*, found as a float occurrence near Janakpur[1], all other animal fossils are from Siwalik exposures in western Nepal.

The 1974 Milwaukee Public Museum Paleontological Reconnaissance in Nepal surveyed poorly exposed Siwalik rocks in eastern Nepal, from the valley of the Arun River on the east to the valley of the Kamla River on the west. Poorly preserved molluscan fossils were collected at one locality. These specimens suggest the presence of stratigraphic units in eastern Nepal that are approximately equivalent to those that have been mapped by the Nepal Geological Survey in western Nepal.

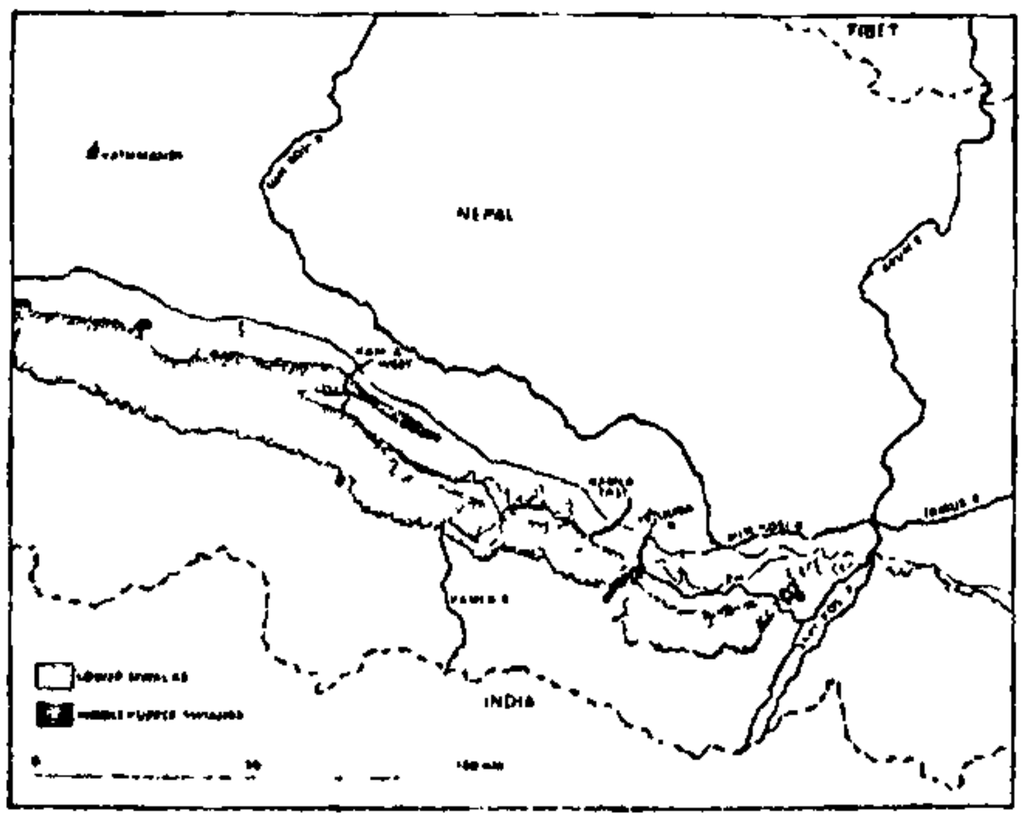

FIG. 1. Location of the fossil mollusc site, MPM-N 1. Siwalik rock distribution is indicated by the dotted pattern, based on the geologic map by Itihara *et al.*, 1972.

Fossil locality MPM-N 1 (Fig. 1) is located at 26° 50′ N and 86° 36′ E on Survey of India topographic map J/9 (No. 72). It is on the northeastern bank of the Trijuga river, approximately 1·5 kilometres upstream of the small settlement of Gunte. The fossils were collected from a dark claystone in a sequence of irregularly alternating sandstones and claystones, dipping steeply northwestward. The locality is approximately 225 metres above sea level, and the rocks are tentatively assigned to the middle part of the poorly differentiable Siwalik series[2].

The fossils reported here are two specimens of mollusc, preserved as casts, which were the germinal structures for ovoid concretions within a chaotic soft mudstone. These specimens have been deposited in the collection of the Department of Geology, Trichandra College of Tribhuvan University, Kathmandu, Nepal.

The two molluscs (Figs. 2 and 3) are difficult to identify because of their incompleteness and the nature of the preservation. The better preserved of the two belongs in the order Unioidea, but more specific assignment is not possible with any degree of certainty. Dr. G. Shaak suggests (personal communication) that it may belong to the genus *Etheria*, Family Etheriidae; this genus has a Pliocene to Recent, Africa-Indian Ocean region distribution.

The only other area in the Nepal Siwaliks from which identifiable molluscs have been reported is the Dang Deokhur area, some 420 km to the west-northwest of locality MPM-N 1. Tshering (unpublished work) identified the gastropods *Turritella* and *Cerithium* and the pelecypods *Unio* and *Venus* from middle Siwalik gray clays exposed in the

drainage of the Rapti River. Unidentifiable molluscs were reported in presumed upper Siwalik rocks in the Bheri and Babai River valleys by Kayastha (unpublished work).

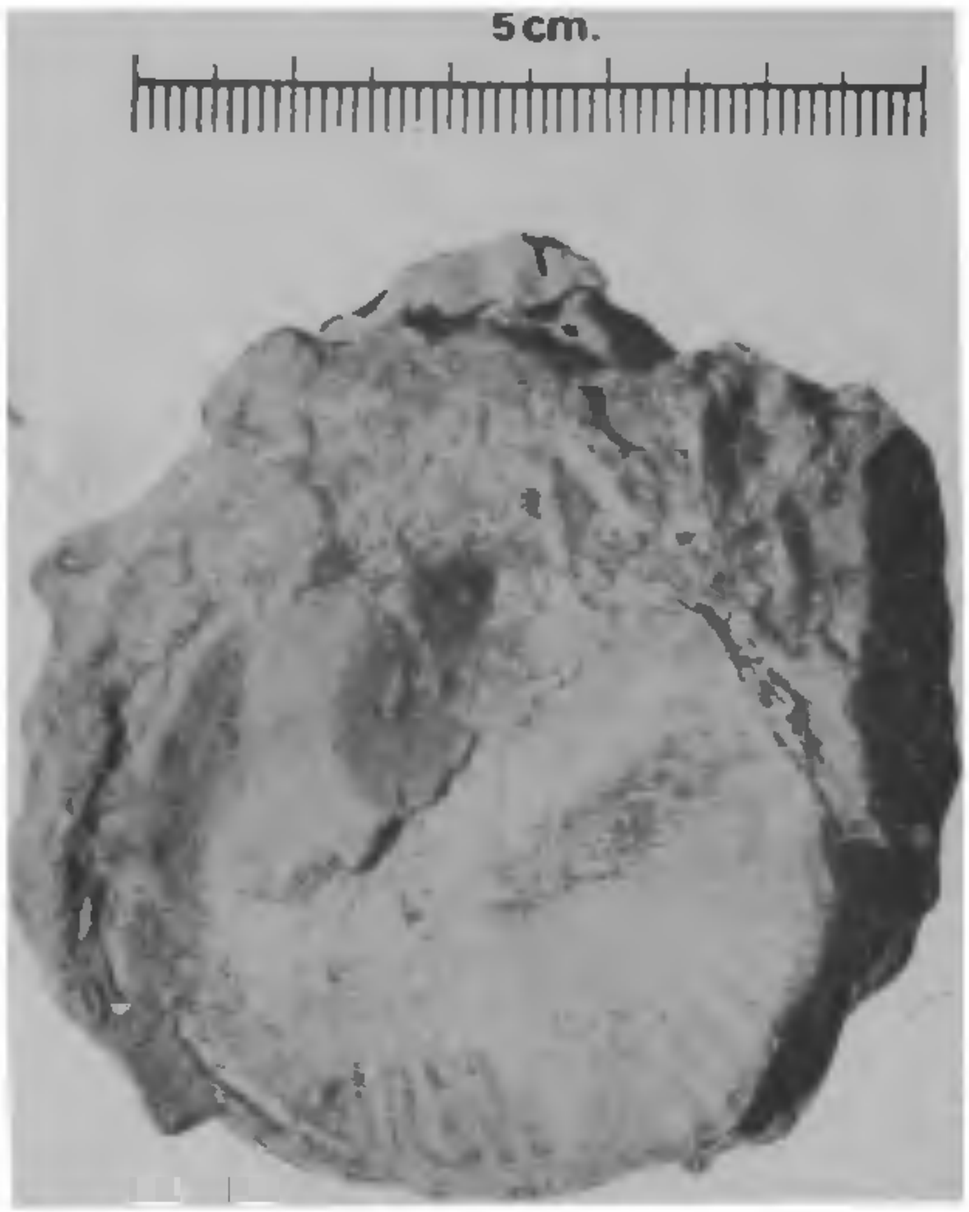

FIG. 2. Fossil mollusc from locality MPM-N 1.

As is also the case in western Nepal, the Trijuga locality produced plant remains in the form of amorphous vegetation mats, root casts and concentrations of carbonaceous material.

Locality MPM-N 1 is, by reason of the fine-grained sediment, considered to be in the middle part of the Siwalik series. Zonation of the Siwaliks is based primarily upon fossil vertebrate assemblages in the well-studied Siwalik Hills of India and Pakistan, and only secondarily upon a general increase in average grain size upward in the section with much of the upper Sivaliks being conglomeratic. In Nepal, due to the absence of stratigraphically dependable vertebrate evidence, grain size is the primary criterion for stratigraphic assignment, and this is certainly inadequate. The only reasonably detailed geologic map[2] of the eastern Nepal Siwaliks places MPM-N 1 almost squarely upon a thrust fault which separates lower Siwalik rocks on the north from middle-upper Siwalik rocks on the south. While we tend to agree with the delineation of the sedimentary units, we see no evidence for such a thrust fault.

FIG. 3. Fossil mollusc from locality MPM-N 1.

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1. Sharma, C. K., *Geology of Nepal*, Mani Ram Sharma, Kathmandu, Nepal, 1973, pp. 189.
2. Itihara, M., Shibasaki, T. and Miyamoto, N., *Jour. Geosci., Osaka City Univ.*, 1972, 15, 77.