

Lucknow for their kind suggestions and help in the identification of the present fossil.

Birbal Sahni Institute of Palaeobotany,
Lucknow,
October 1, 1966.

R. N. LAKHANPAL.
R. DAYAL.
R. K. JAIN.

and the Middle Siwalik with the Nagri and Dhok-Pathan of Sarmatian and Pontian ages respectively. The Middle Siwaliks of this area can be correlated with the fossiliferous beds of Haritalyangar³ (31° 32' : 76° 38'), Kot-Kahlur (31° 18' : 76° 31') and Aitham (32° 47' : 76° 01') in Jammu and Kashmir, where also the author has found for the first time some vertebrate fossils of Sarmatian and Pontian ages.

The author is much indebted to Shri. T. Banerjee, Superintending Geologist, for critically going through the manuscript and for valuable suggestions.

Directorate of Geology, Oil and Natural Gas Commission,
Dehra Dun, October 24, 1966.

UMA SHANKER MISRA.

* Published with the permission of the Director of Geology, Oil & Natural Gas Commission. The views expressed are those of the author.

1. Medlicott, H. B., *Mem. Geol. Surv. Ind.*, 1864, t. 3, p. 122.
2. Boileau, V. H. and Kohli, G., (Unpublished Report of the Geological Survey of India), 1952.
3. Pilgrim, G. E. *Rec. Geol. Surv. Ind.*, 1963, t. 43, Pt. 4, p. 319.

**VERTEBRATE FOSSILS FROM
DERA-GOPIPUR TEHSIL,
DISTRICT KANGRA (PUNJAB)***

AN area of about 120 sq. km. of Siwalik country lying between Dera-Gopipur (31° 53' : 76° 13') and Rani Tal (32° 00' : 76° 14') has yielded a rich assemblage of vertebrate fossils during the field season 1965-66. In all about 116 mammalian remains of different species have been found. The identification of the different finds is under way.

The stratigraphic sequence exposed in the area is tabulated in Table I. A few characteristic fossils are mentioned in the table.

TABLE I

Sub-group	Thickness in metres	Characteristic fossils	Horizon	Age	Equivalent time stratigraphic unit Europe
Upper Siwalik	735	No vertebrate fossil found	Pinjaur	Pliocene	Villafranchian
Middle Siwalik	354-650	<i>Mastodon (Tetralophodon punjabiensis)</i> , <i>Hipparion theobaldi</i> , <i>Giraffa punjabiensis</i> , <i>Boselaphus</i> sp., <i>Proleptobos</i> sp., <i>Trogoceros</i> sp., <i>Genelia (?)</i> . <i>Superba</i> Pilg.	Dhok-Pathan	Upper Miocene	Pontian
	734-935	<i>Driopithecus punjabicus</i> Pilg. <i>Stegolophodon cautleyi</i> , <i>Conolyus</i> sp.	Nagri	Middle Miocene	Sarmatian
Lower Siwalik	25- 46	<i>Trilophodon Chinjiensis</i> , <i>Tetralophodon</i> sp., <i>Amphicyon palaeindicus</i> , <i>Aceratherium</i> sp., <i>Giraffokeryx</i> sp.	Chinji	do.	Upper Tortonian

The fossils from the Lower and Middle Siwalik of this area will be of great help in correlation of the different rock units. Systematic mapping of the Siwalik belt has shown that the rocks suffer from rapid facies changes which introduce difficulty in subdividing the individual rock units. The present find of the fossils from the Lower and Middle Siwalik rocks of Dera-Gopipur—Rani Tal area has proved the time-equivalence of the Lower Siwalik rocks of this area with the Chinji of upper Tortonian age,

**ON SOME ASPECTS OF THE
PRE-CAMBRIAN GEOLOGY OF PARTS
OF THE SHILLONG PLATEAU, ASSAM***

THE Shillong Plateau of Assam is a block of pre-Cambrians fringed by Cretaceous-Eocene shelf sediments. The pre-Cambrians comprise high grade metamorphics including granulites, amphibolites, gneisses and schists, and metasediments of the Shillong Series, besides several bodies of granite. This note attempts to highlight the implications of some recent remapping

of the Shillong Series in the central part of the Shillong Plateau by the author, which is leading to an interesting re-evaluation of the pre-Cambrian geology of the area.

Medlicott (1869, p. 44 ff.) described a sequence of sediments which he named the Shillong Series. He thought that these could be divided into an argillaceous facies below and an arenaceous facies above deposited "consecutively". At the junction of the two facies he described from various localities a conglomerate of consistent lithologic characters; he also thought that the rocks grade from a predominantly submetamorphic suite to strongly metamorphosed quartzites, schists and gneisses but he did not discuss the distinctions between this latter group and older rocks of his 'Gneiss Series'. He described a group of porphyritic granites around Myllem as intrusive into the Shillong Series. His classifications are retained in later literature though the "Gneiss Series" is now implicitly equated with the Archæans.

Present work shows that the conglomerate on the Masura ridge north of Barapani (25° 38' 00" : 91° 32' 30"), hitherto taken as the junction of the argillites and the arenites of the Shillong Series represents a profound unconformity separating suites radically different in grades of metamorphism and styles of deformation. The strongly metamorphosed rocks below the conglomerate grade northwards into gneisses and granulites of the typical Archæans. Above the conglomerate the rocks are of the typically "submetamorphic" Shillong Series, including a group of current-bedded sandstones with minor shales (slate-phyllite). The Barapani-ridge provides a typical cross-section of the conglomerate basal to the Shillong Series. The high grade metamorphic rocks below the conglomerates, which indicate a marked unconformity, are now to be treated as forming a separate group.

The basal conglomerate is not developed everywhere; weakly metamorphosed sandstones of the Shillong Series as here defined may lie abruptly against strongly metamorphosed quartzites of the older group as seen at Mawmaram village on the road from Mawngup to Mairang; the foliation in the metamorphics may even parallel the bedding in the Shillong Series. In such cases delineation should be on contrasted metamorphism and it is necessary to distinguish between massive sandstones and massive metaquartzites. The Shillong Series sediments are post-orogenic epicontinental, evidently deposited in an intra-cratonic basin.

Within the metamorphics north of the Masura ridge occur a syn. to slightly late kinematic medium-grained granodiorite-adamellite-syenite-diorite body that has broadly concordant contacts with the metamorphics and shows very variable petrography, due to assimilation as well as granitization of various rocks. Its characteristics—gneissose borders, besides xenoliths all of high metamorphic grade—are consistent with a "parautochthonous" emplacement. These granitic rocks, well exposed on the Um Ran stream near the 41st milestone on the Gauhati-Shillong Highway, will be called the Um Ran Pluton. Later than this is a porphyritic granite of the typical Myllem type, very well seen near Nongpoh on the same highway; this type, later than the culminating metamorphism, is the better known and is associated in many areas with the non-porphyritic type. The occurrence of these associated granites all across Assam and the universal presence in these of weakly perthitic microcline rather than orthoclase as the only potash feldspar phase suggest that these are all mesozonal. This casts doubts on the current view that these granites are intrusive into the Shillong Series—a view clearly based on Medlicott's opinion of varying metamorphism referred to above. The relationship between the granites and the Shillong Series as here separated, will have to be studied.

Geol. Survey of India. SUJIT KUMAR MAZUMDER.
Assam Circle, October 12, 1966.

* Published with the kind permission of the Director-General, Geological Survey of India.

1. Medlicott, H. B., Geological Sketch of the Shillong Plateau in N.E. Bengal, *Mem. G.S.I.*, 1869, 7.

OCCURRENCE OF *STIGMATOGOBIOUS ROMERI* (M. WEBER) IN RIVER NARBADA

Stigmatogobius romeri (M. Weber) has so far been recorded only from islands like Andamans, Java, etc.¹⁻² In December 1965, in the course of a survey of river Narbada seven specimens of this species ranging from 31.5 mm. to 42.0 mm. total length were collected from freshwater, six at Targhat and one at Fatheghat on Narbada (Hoshangabad District, Madhya Pradesh). This is the first record of this species from mainland of India.

This species has been described in detail by Mukerji³ and Koumans¹⁻²; the latter has done much in bringing out the synonymy involved. A comparison of these specimens from the