

UPPER MIOCENE ANTHROPOIDS FROM THE SIWALIK BEDS OF HARITALYANGAR, HIMACHAL PRADESH, INDIA

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ABSTRACT. The Nagri beds at Haritalyangar contain a rich mammalian fauna. The present paper deals primarily with the description of the primate fossils collected by the author in 1954 and 1962. A maxillary fragment consisting of three molars is assigned to *Sivapithecus sivalensis*. In addition, a few isolated upper and lower molars, an upper canine, and an upper premolar, belonging to different genera of anthropoid apes, have been briefly outlined. A lower third molar of *Sugrivapithecus gregoryi* has also been recovered for the first time.

The primates collected from Haritalyangar are generally in the form of isolated teeth and broken fragments of mandible, the upper dentition being markedly scarce. This is rather difficult to explain. The total absence of limb bones and skulls, the fragmentary condition of the mandibles and maxillae, and the large concentration of hyaenodonts in the sediments suggest that the hominoids were devoured by these predacious animals.

Fossil higher apes, from the Siwalik beds of India, have been described over a long period. Only two specimens were recorded as far back as the year 1910. Pilgrim (1910, 1915, and 1927) recognized several genera and numerous species of fossil apes from the Siwaliks. His researches were based on the detailed study of imperfect jaws, teeth, and fragments of maxilla. The extreme rarity of these fossils and their poor preservation naturally gave rise to a certain amount of splitting, and new genera and species were founded from time to time. The situation has not changed very much in recent years, as no new material of importance has been discovered. Recently (1951, 1954, and 1962) the author made a few attempts towards the systematic collection of these fossils in some of the well-known localities such as Haritalyangar and Chakrana. Eleven more specimens have been found, in addition to the eighty-two finds already recovered from the Siwalik beds.

Re-examination of the higher anthropoid apes by Gregory, Hellman, and Lewis (1938), has thrown much light on the correlation of the individual finds and on their systematic position. Lewis (1937) made an attempt to simplify the taxonomy of the large Siwalik anthropoid fauna, comprising ten genera and twenty species, to four genera and ten species. His contention, that the Siwalik anthropoid fauna could not have been large, being practically restricted to Chinji (Sarmatian) and Nagri (Pontian) formations, does not appear to be tenable. In so far as we are aware, the Upper Miocene formations of Kenya have yielded a relatively large number of fossil hominoids of different groups in recent years. Moreover, remains of *Dryopithecus* (closely resembling *D. punjabicus* of Siwaliks) from Kaiyuan, China, have been reported by Chow (1958). From this evidence, it is reasonable to assume that the Siwaliks of India could have been one of the centres of radiation of these great apes. The time duration from Chinji to Nagri is quite considerable, and it is likely that diverse types existed, showing considerable variation in size and structure adumbrating on their genetic relationship. *Ramapithecus*, for example, is actually one of the latest members of this group showing progressive characters.

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The several other higher mammalian forms, including the apes which lived contemporaneously during the period under review, give additional evidence that conditions for their existence were quite favourable. De Terra (1936) has expressed the view that the most favourable conditions existed during early and middle Pliocene. Gregory, Hellman, and Lewis (1936) have postulated that the oncoming glaciers were responsible for the extermination of anthropoids in Europe, India, and China, though a few forms persist in Africa, Burma, and south-eastern Asia. The study of certain fossil wood recovered from the Siwalik beds shows conditions favouring arboreal life, in part at least. It is the ecological conditions, and not the length of the time, that need emphasis. The absence of associated upper and lower dentition in the collections, and the degree of wearing affecting the dimensions and proportions, especially in the lower molars, make it difficult to reduce the different species to the rank of synonyms on the available material.

In the upper dentition, the molars of *Dryopithecus punjabicus* show a number of features which contrast strongly with *S. sivalensis* (Lydekker), and resemble closely the upper molars found in Europe and previously assigned to *Dryopithecus*. This is in accordance with the views expressed earlier by Le Gros Clark and Leakey (1951). *Dryopithecus darwini* has also been assigned to *Sivapithecus darwini* by Lewis. *Palaeosimia rugosidens* Pilgrim contrasts strongly with *S. sivalensis* in a number of characters, especially in the highly wrinkled enamel and in the relatively large paracone. As pointed out earlier, *Dryopithecus* remains closely resembling the Indian form have been reported from China, which gives additional evidence of the existence of these forms in this region. The systematic position of *D. giganteus* is still uncertain and more material is needed for a fuller analysis of this species. The new finds of fossil hominoids from Kenya have been discussed by Frisch (1962). A recent paper by Simons (1961) on the phyletic position of *Ramapithecus* is worthy of note. The author had useful discussions with Dr. Simons of Yale University, who suggested the possibility of one of the upper molars in the author's collection belonging to *Ramapithecus*. It is also now known that *Ramapithecus* was actually recovered from the Nagri beds and not from Tatrot.

MODE OF OCCURRENCE

Numerous fossils, in the form of bones, isolated teeth, fragments of mandible, maxilla, and rarely skulls, have been collected from the Nagri beds of Haritalyangar over a long period. From the faunal list it is apparent that diverse forms of higher mammals such as tragulids, equids, suids, rodents, and even such large forms as rhinoceros, existed along with other groups represented by crocodiles and fishes. The abundance of teeth and dermal scutes of reptiles, as well as crabs, suggests the existence of certain inland lakes, which the mammals frequently visited. The occurrence of hyaenodonts with the hominoids and tragulids suggests that the latter were attacked by the carnivorous beasts and subsequently washed into the lacustrine deposits, a condition similar to that stated by Le Gros Clark and Leakey (1951) on the Miocene deposits of Kenya. Further, the large concentration of fossils including the primates in a restricted area (which was later uplifted) suggests that conditions were very favourable for their growth and existence. The relative abundance of these fossils and their general fragmentary condition show that the soft portions of the skull and limb bones were actually eaten, and only the bones which escaped this treatment subsequently became fossilized.

TABLE 1. Stratigraphical distribution of fossil mammals in the Haritalyangar area

	Lower	Middle		Upper	
	Chinji	Nagri	Dhok-pathan	Tatrot	Pinjor
PRIMATES					
Lorisidae					
<i>Indraloris lulli</i> Lewis, 1933		×			
Pongidae					
<i>Bramapithecus sivalensis</i> Lewis, 1937		×			
<i>Dryopithecis punjabicus</i> Pilgrim, 1910		×			
<i>Ramapithecus brevirostris</i> Lewis, 1934		×			
<i>Sivapithecus sivalensis</i> (Lydekker), 1879		×			
<i>Sivapithecus indicus</i> Pilgrim, 1915		×			
<i>Sivapithecus aiyengari</i> Prasad, 1961		×			
<i>Sugrivapithecus salmontanus</i> Lewis, 1934		×			
<i>Sugrivapithecus gregoryi</i> Lewis, 1936		×			
RODENTIA					
Rhizomyidae					
<i>Rhizomys sivalensis</i> Lydekker, 1878		×			
<i>Rhizomys nagrii</i> Hinton, 1933		×			
<i>Rhizomys lydekkeri</i> Hinton, 1933		?			
<i>Rhizomys pilgrimi</i> Hinton, 1933		×			
<i>Rhizomys harii</i> Prasad, 1963		×			
Hystriidae					
<i>Sivacanthion complicatus</i> Colbert, 1933		×			
Thryonomyidae					
<i>Sayimys perplexus</i> Wood, 1937		×			
Cricetidae					
<i>Kanisamys sivalensis</i> Wood, 1937		×			
<i>Kanisamys nagrii</i> Prasad, 1963		×			
Muridae					
<i>Mastomys colberti</i> Lewis, 1939		×			
CARNIVORA					
Procyonidae					
<i>Sivanasua himalayensis</i> Pilgrim, 1932		×			
<i>Sivanasua nagrii</i> Prasad, 1963		×			
Mustelidae					
<i>Sivaonyx bathygnathus</i> (Lydekker), 1884		×			
<i>Enhydriodon falconeri</i> Pilgrim, 1931		×			
Viverridae					
<i>Viverra nagrii</i> Prasad, 1963		×			
<i>Vishnuictis hariensis</i> Prasad, 1963		×			
Hyaenidae					
<i>Crocota gigantea</i> (Schlosser) var. <i>latro</i> Pilgrim, 1932		×	×		
<i>Crocota talyangari</i> Prasad, 1963		×		×	
<i>Crocota mordax</i> (Pilgrim) var. <i>tatroti</i> Prasad, 1963		×		×	
<i>Lycyaena macrostoma</i> (Lydekker), 1884		×			
<i>Ictitherium nagrii</i> Prasad, 1963		×			
Felidae					
<i>Megantereon praecox</i> Pilgrim, 1932		×			
<i>Vinayakia intermedia</i> Prasad, 1963		×			

TABLE 1 (cont.)

	Lower	Middle		Upper	
	Chinji	Nagri	Dhok- pathan	Tatrot	Pinjor
PERISSODACTYLA					
Equidae					
<i>Hipparion theobaldi</i> (Lydekker), 1877		×	×	×	×
<i>Hipparion antelopinum</i> (Falconer and Cautley), 1849		×	×		
Rhinocerotidae					
<i>Gaindatherium browni</i> Colbert, 1934		×			
<i>Rhinoceros sivalensis</i> (Falconer and Cautley), 1847			×		
ARTIODACTYLA					
Suidae					
<i>Tetraconodon mirabilis</i> Pilgrim, 1926		×			
<i>Lophochoerus nagrii</i> Pilgrim, 1926		×			
<i>Propotamochoerus uliginosus</i> Pilgrim, 1926		×	×		
<i>Dicoryphochoerus robustus</i> Pilgrim, 1926		×			
<i>Dicoryphochoerus titanoides</i> var. <i>jholi</i> Prasad, 1962		×			
<i>Dicoryphochoerus vagus</i> var. <i>nagrii</i> Prasad, 1962		×			
<i>Sus advena</i> Pilgrim, 1926		×			
<i>Sus tatroti</i> Prasad, 1962				×	
Anthracotheriidae					
<i>Anthracotherium punjabiense</i> Lydekker, 1877		×			
<i>Anthracodon hariensis</i> Prasad, 1962		×			
<i>Anthraconema dangari</i> Prasad, 1962		×			
Tragulidae					
<i>Dorcabune nagrii</i> Pilgrim, 1915		×			
<i>Dorcatherium nagrii</i> Prasad, 1963		×			
<i>Dorcatherium minus</i> Lydekker, 1876		×			
Giraffidae					
<i>Giraffokeryx punjabiensis</i> Pilgrim, 1910		×			
<i>Vishnutherium iravaticum</i> Lydekker, 1876		×			
<i>Hydasphitherium megacephalum</i> Lydekker, 1876		×			
Bovidae					
<i>Gazella lydekkeri</i> Pilgrim, 1937		×	×		
<i>Tragocerus punjabicus</i> Pilgrim, 1937		×	×		
<i>Selenoportax vexillarius</i> Pilgrim, 1937		×	×		
<i>Pachyportax nagrii</i> Pilgrim, 1937		×	×		
<i>Pachyportax latidens</i> Pilgrim, 1937		×		×	
PROBOSCIDEA					
<i>Deinotherium indicum</i> Falconer, 1845			×		
<i>Trilophodon hasnotensis</i> Osborn, 1936			×		
<i>Trilophodon macrognathus</i> Pilgrim, 1913	×		×		
<i>Pentalophodon sivalensis</i> (Cautley), 1836			×		
<i>Tetralophodon falconeri</i> Osborn, 1936			×		
<i>Synconolophus</i> cf. <i>dhokpathanensis</i> Osborn, 1936		×			
<i>Stegolophodon bombifrons</i> (Falconer and Cautley), 1847			×		
<i>Stegolophodon latidens</i> (Clift), 1828				×	

The fossil hominoids under description were collected by the author from the Nagri beds of Haritalyangar (31° 32" N., 76° 38" E.) during the years 1954 and 1962. The stratigraphy and the descriptions of certain other fossils have already been dealt with by the author (1962, 1963). The geological formations in the Haritalyangar area extend from the Lower to the Upper Siwaliks. The bulk of the fossils come from the Nagri (Sarmatian) and Dhokpathan (Pontian) stages, sections of which are exposed within a band of seven kilometres, east of Haritalyangar.

SYSTEMATIC DESCRIPTIONS

Genus SIVAPITHECUS Pilgrim 1910

Genotype S. sivalensis

Diagnosis of the genotype. Lewis (1937) states: 'Jaws and cheek teeth medium large to very large in size. Molars moderately broad; crowns and robust cusps of medium height; labial and lingual cusps converge toward midline, greatest convergence lingual above and labial below. Upper dental arch with incisors separated from highly variable canines by a diastema. No diastemata in the lower dental arch. Horizontal rami of medium depth.'

Sivapithecus sivalensis (Lydekker)

Plate 20, figs. 1, 7

Description. The fragment of the maxilla recovered from the Nagri beds of Haritalyangar consists of the lower border of the zygomatic process as well as a portion of the palatal surface. The intermaxillary suture, which is fairly clear, can be estimated. It is about 20 mm. and suggests that the palate was narrow in comparison with the size of the molars. On a reconstructed palate of *Sivapithecus sivalensis*, it has been estimated by Le Gros Clark and Leakey (1951) to be about 25 mm. In *S. indicus* (right maxilla D. 196) the width is about 24 mm. The preserved length of the maxilla anteroposteriorly is 34.5 mm., whereas in *S. indicus* it is about 35 mm.; in *S. sivalensis* it is 32 mm. This emphasizes the wide variation depending on the age and sex of the individual. However, the bone was undoubtedly part of a large specimen considering the general proportions of the molars. The maxillary fragment consists of three molars, of which the third is in

EXPLANATION OF PLATE 20

- Fig. 1. *Sivapithecus sivalensis* (Lydekker). Maxillary fragment (G.S.I. No. 18064), 1a, occlusal view of molars, 1b, side view, × 2.
 Fig. 2. *Sivapithecus indicus* Pilgrim. Upper Canine (G.S.I. No. 18065), 2a, lingual aspect, 2b, labial aspect, × 2.
 Fig. 3. *Sivapithecus indicus* Pilgrim. Upper premolar (G.S.I. No. 18066), 3a, posterior view, 3b, occlusal view, × 2.
 Fig. 4. *Sugrivapithecus gregoryi* Lewis. Lower third molar (G.S.I. No. 18067), occlusal view, × 2.
 Fig. 5. *Dryopithecus punjabicus* Pilgrim. Isolated upper third molar (G.S.I. No. 18068), occlusal view, × 2.
 Fig. 6. *Sivapithecus sp.* Isolated molar (G.S.I. No. 18070), occlusal view, × 2.
 Fig. 7. *Sivapithecus sivalensis* (Lydekker). Last lower premolar (G.S.I. No. 18069), occlusal view, × 2

a very good state of preservation. The first and second molars are partly worn, so that the details of the cusps, especially the disposition of the sulci, are not clear.

TABLE 2.
Measurements of upper teeth of various Dryopithecinae, compared with *Sivapithecus sivalensis*
(From Le Gros Clark and Leakey, 1951)

	P 3			P 4			M 1			M 2		
	a.p. mm.	tr. mm.	ind. mm.	a.p. mm.	tr. mm.	ind. mm.	a.p. mm.	tr. mm.	ind. mm.	a.p. mm.	tr. mm.	ind. mm.
<i>S. africanus</i> Le Gros Clark and Leakey (C.M.H. 6)	8.2	12.3	150	7.5	11.8	157	10.6	11.3	107			
<i>S. africanus</i> Le Gros Clark and Leakey (C.M.H. 26)							10.6	11.1	105			
<i>S. africanus</i> Le Gros Clark and Leakey (C.M.H. 27)										12.0	11.6	97
<i>S. orientalis</i> Pilgrim (D. 196)	7.7			7.3	12.0	164	11.0	12.0	109	12.8	14.2	111
<i>S. sivalensis</i> (Lydekker) (617 and K. 29/466)	8.7	11.0	126	7.6	11.4	150	10.6	12.2	115	11.5	13.7	119
<i>S. sivalensis</i> (Lydekker) (614)							10.3	12.1				
<i>S. indicus</i> Pilgrim (D. 176)							10.9	12.7	117			
<i>S. indicus</i> Pilgrim (D. 191)							10.5	13.5?	129?	12.5	14.0	112
<i>S. indicus</i> Pilgrim (612)							11.3	12.4	109			
<i>S. indicus</i> Pilgrim (613)										12.7	15.5	122
<i>S. indicus</i> Pilgrim (616)	8.9	11.3	127							13.3	15.3	115
<i>Palaeopithecus</i> (? <i>Sivapithecus</i>) <i>sivalensis</i> Lydekker	6.8	11.4	168	6.8	11.4	168	10.8	12.0	111	11.3	12.9	114
<i>D. punjabicus</i> Pilgrim	7.0	9.5	136	6.6	9.7	147	10.4	11.3	109	10.6	11.4	108
<i>D. germanicus</i> Abel.							9.6	10.0	104			
<i>D. germanicus</i> Abel.										10.4	11.0	106

First molar: it is more square and smaller than the second molar, and equals the third molar in general proportions. The four main cusps have become swollen, the cusps are higher and blunt. Cingulam is absent. The crown surface shows an advanced degree of wear, and the finer details of the teeth are not clear, though the morphological pattern of the teeth can be made out to some extent. The crests connecting the protocone with the paracone and metacone are not distinct because of wear.

Dimensions a.p. tr. index
12.0 mm. 12.0 mm. 100

Second molar: in the second molar, the cusps are pyramidal in shape, with a broad base. Due to the convergence of the main cusps, the trigon base is relatively small in relation to the size of the crown. The paracone and metacone are subequal, and the protocone has a larger base and is connected by crests with the paracone and metacone. Due to dental decay, the oblique crest connecting the protocone with the metacone cannot be made out. A posterior fovea is slightly developed. The hypocone is comparatively smaller than the protocone. There is no trace of any cingulam.

Dimensions a.p. tr. index
12.0 mm. 13.0 mm. 108

Third molar: the third molar is rather square in shape with four prominent cusps, of

which the protocone is the largest. The metacone and paracone are subequal, whereas the hypocone is very prominent. The enamel does not show any coarse secondary foldings. The crests connecting the protocone with the paracone and metacone can be made out more clearly than in the case of first and second molars. The posterior fovea is slightly developed. There is no trace of any cingulum.

<i>Dimensions</i>	<i>a.p.</i>	<i>tr.</i>	<i>index</i>
	12.0 mm.	12.0 mm.	100

Comparisons with other known maxillary fragments of Siwalik anthropoid apes, which are, however, few in number, suggest that the specimen is attributable to the genus *Sivapithecus*. In the peculiar shape of the molars, especially the third molar, and in the disposition of the cusps, which are almost equal in size, the specimen under description contrasts strongly with *Sivapithecus indicus* and *S. sivalensis* and probably justifies its inclusion under a new species. The specimen differs from *S. africanus* in the absence of an antero-internal cingulum. It is provisionally assigned to *S. sivalensis* as it shows the closest resemblance to that species. The homoeotype bears G.S.I. Type No. 18064.

Sivapithecus indicus Pilgrim

Description. Upper right premolar: special importance attaches to this material as well-preserved upper premolars of *Sivapithecus* are rare in the extreme, and the few that have been recovered are invariably fragmentary in nature. This isolated upper premolar, which is unworn and well preserved, was collected from the same beds as the maxillary fragment. Pilgrim (1927), while examining a right maxillary fragment (D. 196), refers to a single external root in P 3. It appears to the author that the lateral portion of P 3 along with the root must have been broken before mineralization. The premolar under consideration, however, has two external roots broken at the base. The cusps are subequal. The anterior and posterior cingula are conspicuous and well-defined crests extending from labial cusps anteriorly and posteriorly separate the two cusps by a fairly deep antero-posterior sulcus.

<i>Dimensions</i>	<i>a.p.</i>	<i>tr.</i>	<i>index</i>
	8.0 mm.	12.0 mm.	150

The large size of the upper premolar teeth is characteristic of the genus *Sivapithecus*. From comparison, it is found that the premolars in *Dryopithecus* were smaller and also exhibit differences in the cusp pattern. It has the closest resemblance to the Indian form *Sivapithecus indicus* and compares favourably with *S. africanus* in so far as the dimensions are concerned. The anterior and posterior cingula in *S. sivalensis* appear to be more well defined than in *S. indicus*. Pilgrim's (1927) measurements of the fourth premolar in D. 196, collected from the same horizon near Haritalyangar, appear more or less assumed as the anterior portion in the specimen is broken off, but his assumption appears to be correct as the P 4 under description compares favourably with his measurements. Accordingly, the isolated premolar is provisionally referred to *Sivapithecus indicus*. It bears the G.S.I. Type No. 18065.

Upper canine: upper canines of *Sivapithecus* have been previously recovered from the Nagri beds of Haritalyangar. The specimen under description was collected by the

author from near the Hari escarpment and is provisionally assigned to *Sivapithecus indicus*. As pointed out by Gregory, Hellman, and Lewis (1938) 'the upper canines of the Indian Anthropoids vary from an almost premolar-like crown, in the supposed female *S. sivalensis*, to a dagger-like crown in the male type of *S. orientalis*'. But *S. orientalis* is now referred to *S. indicus* by Lewis. Material under description is very well preserved, except for the broken portion of the crown. The deep anterior groove and the posterior blade-like ridge are other characteristic features. Coarse wrinkles are preserved on the inner aspect with a fairly well preserved cingulum. The total length of the specimen is 40 mm.; the preserved height of the crown is 17 mm. The antero-posterior diameter of the base of the crown is 15.5 mm. and transverse 13 mm. Pilgrim (1927) refers to an upper left canine of *Sivapithecus* from the Chinji beds of the Lower Siwaliks. The dimensions in centimetres are as follows: length 16.2, breadth 10.6, and height 19.4. However, the specimen under description conforms closely in the general proportions as well as in the morphological pattern to the canine of *S. indicus* and is accordingly assigned to that species. It bears the G.S.I. Type No. 18066.

Sivapithecus sp.

Plate 20, fig. 6

Description. Isolated molar: a further accession to the material is an isolated molar from the same beds. The details of the tooth are not very clear as the occlusal surface is completely worn and the groove pattern is obliterated. It is provisionally assigned to *Sivapithecus*. It bears G.S.I. Type No. 18070.

Last lower premolar: this is well preserved, P 4, G.S.I. Type No. 18069; it was recovered from the clay bands about a kilometre east of Haritalyangar. The buccal and lingual cusps of the main crown are well preserved and permit specific identification. The premolar is small in the general proportions when compared to *S. indicus* and *S. sivalensis*.

	<i>a.p.</i>	<i>tr.</i>	<i>index</i>
<i>Sivapithecus sivalensis</i> (Lydekker) (G.S.I. Type No. D. 177)	8.5 mm.	9.9 mm.	—
<i>Sivapithecus sivalensis</i> (Lydekker) (G.S.I. Type No. 18069)	8.0 mm.	8.0 mm.	100
<i>Proconsul major</i> Le Gros Clark & Leakey	9.0 mm.	9.6 mm.	107

The lingual and buccal cusps of the crown are not worn down to the level of the talonid basin, and the crests connecting the two cusps are well preserved. There is an anterior foveal depression. Except for the variation in size, it closely resembles a fourth premolar of *S. sivalensis*, and it is provisionally referred to that species pending further accession of material.

Genus SUGRIVAPITHECUS Lewis 1934

Sugrivapithecus gregoryi Lewis

Plate 20, fig. 4

Diagnosis. Lewis states: 'Lower molars even narrower than *Sugrivapithecus salmontanus*. Labial side walls of crown show protoconid and hypoconid to be strongly set off from

each other from the occlusal surface to the base of the crown. Metaconid considerably exceeds protoconid in labio-lingual diameter of the cusp base. Antero-posterior diameter of metaconid base relatively longer than in *S. salmontanus*, as compared to the same measurement on the protoconid base. Hypoconid and hypoconulid relatively small. Hypoconulid more labial in position than in *S. salmontanus*. Entoconid located at approximately same antero-posterior latitude as hypoconulid. Main posterior crest nearly perpendicular to midline.⁷

Description. Lower right molar: in addition to the above material, a practically unworn lower right third molar was recovered from the Nagri beds, east of Haritalyengar, for the first time. The molar is very narrow with low cusps. The enamel is highly wrinkled with a prominent anterior fovea. The relative narrowness of the talonid is also very characteristic. The metaconid and entoconid are subequal, and the hypoconulid is more central in position. There is no trace of any cingula.

<i>Dimensions</i>	<i>a.p.</i>	<i>tr.</i>	<i>index</i>
	12.0 mm.	9.0 mm.	75

The lateral compression and elongation is a common feature in the lower molars of *Sugrivapithecus*. In certain characters the lower molar under description compares favourably to some extent with *Sugrivapithecus gregoryi* Lewis.

Measurements of lower dentition of *Sugrivapithecus*

(From Lewis, 1936)

		<i>S. gregoryi</i>	<i>S. salmontanus</i>
M $\bar{2}$	Antero-posterior	12.6 mm.	12.6 mm.
	Transverse	9.9 mm.	10.4 mm.
	Breadth index	76.7	83.0
M $\bar{1}$	Antero-posterior	11.1 mm.	11.0 mm.
	Transverse	9.0 mm.	9.0 mm.
	Breadth index	81.0	82.0

The pronounced wrinkling of the enamel, the slight crenation of the lingual margin, the low relief of the main cusps, among other things, probably justify inclusion under a new species. However, in view of the fragmentary material, it is provisionally assigned to *S. gregoryi* Lewis. It bears G.S.I. Type No. 18067.

Genus DRYOPITHECUS Lartet
Dryopithecus punjabicus Pilgrim

Plate 20, fig. 5,

Description. Upper third molar: an isolated upper third molar, G.S.I. Type No. 18068, in a fairly good state of preservation, was recovered from below the Hari escarpment. The molar is moderately worn, but the details of the tooth are well preserved. The ridge connecting the protocone and paracone is partly worn out. The metacone and hypocone are very much smaller, the ridge connecting the margin is crenulated, and the fovea posterior, as in the case of *Dryopithecus*, is well developed. The ridge connecting the metacone and hypocone is cleft by two sulci, which unite in the centre to form the valley between the hypocone and connecting protocone-metacone ridge (which is partly worn

Measurements of lower dentition

(Measurements in millimetres)

	P $\bar{4}$			M $\bar{3}$		
	a.p.	tr.	ind.	a.p.	tr.	ind.
<i>Sugrivapithecus gregoryi</i> Lewis (G.S.I. Type No. 18067)	12.0	9.0	75
<i>Sivapithecus sivalensis</i> (Lydekker) (G.S.I. Type No. 18069)	8.0	8.0	100

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