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Primatology

FIELD OBSERVATIONS ON DISTRIBUTION AND TAIL CARRIAGE IN THE CENTRAL HIMALAYAN LANGUR, *PRESBYTIS ENTELLUS SCHISTACEOUS* (PRIMATES)

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(1) *Presbytis entellus schistaceous* (Hodgson) (Cercopithecidae, Colobinae) is a large and heavy subspecies, males being, on an average, somewhat larger and heavier than females. *Adult size* (lengths in mm) : Head-and-body, males 660-762 (av. 720·0), females 584-690 (av. 657·7). Tail: males 914-991 (av. 957·0), females 700-940 (av. 837·9). *Adult weight* (kg) : Males 17·2-18·0 (av. 17·7), females 14·0-18·0 (av. 15·8). The colour, etc. are briefly described. (2) *Distribution* : The Central Himalayas, the foothills and adjacent plains, and the *terai*; up to about 3,200 m altitude : Southern Himachal Pradesh, NW Uttar Pradesh (Kumaon, Garhwal, Doon Valley, "Oudh"), and the Nepal *terai*. Detailed locality records are given. (3) The tail is long (*c.* 106% – 157%, av. 136·3%) of the head-and-body. In the normal or relaxed state (standing, walking) it is carried up and forward in an arc or loop, but the tip remains well above the level of the back. The Loop Index (maximum width/maximum height), as measured in lateral photographs, varies from c. 0·3 (loop long and narrow) to 2·0 (loop wide and shallow). Different parts and proportions of the tail take part in the formation of the loop. (4) Under stress (running, climbing uphill, fighting) the tail loop opens out partly or fully. In repose (sitting) the tail stretches out irregularly on the ground or hangs limp. (5) Comparison is made with the neighbouring subspecies, e.g., *ajax, achilles* and *entellus*.

INTRODUCTION

Tail carriage in Primates has received scant attention and until very recently nothing was known of it in the Hanuman Langur, *Presbytis entellus* (Dufresne) (Cercopithecidae, Colobinae), which is common throughout South Asia (Pakistan, all-India, Nepal, Bhutan, Bangladesh, Sri Lanka). Roonwal (1976) and Roonwal and Mohnot (1977) had hinted at the occurrence of geographical and subspecific variations, and their existence (with two main types and several subtypes) has recently been established (Roonwal, in press, b; also see below, Discussion).

Detailed characteristics of tail carriage are, however, unknown except in the plains-dwelling subspecies, *P. e. entellus*, where Roonwal and Makwana (1976, and in press) have given several characteristics, e.g., the near-fixity of tail stance (left or right) in individuals, the tail portion involved in the loop, the 'Loop Index', sexual dimorphism, etc. In the present account are presented the details for another subspecies, the Central Himalayan Langur, *P. e. schistaceous* (Hodgson), which differs markedly from *P. e. entellus*.

MATERIAL AND METHODS

This account is largely based on field studies in the Sub-Himalayan and Himalayan districts of Saharanpur, Dehra Dun, Pauri, Chamoli and Naini Tal in northwestern

Uttar Pradesh. In addition, some published and unpublished information from Himachal Pradesh and elsewhere (kindly supplied by zoological correspondents) were also utilised. The loop shape and index were studied in lateral photographs.

Synonymy, Characters and Distribution

Presbytis entellus schistaceous (Hodgson)

(Synonyms : *nipalensis* and *hector*)

1840. *Semnopithecus schistaceous* Hodgson, *J. Asiat. Soc. Bengal*, **9**, p. 1212. (Not *schistaceous* of Blanford 1888-91.) Nepal : *Terai* forest and lower hills.

1840. *Semnopithecus nipalensis* Hodgson, *J. Asiat. Soc. Bengal*, **9**, p. 1212. Nepal : *Terai* forest and lower hills.

1928. *Pithecus entellus hector* Pocock, *J. Bombay nat. Hist. Soc.*, **32**, p. 481. Sitabani (Ramnagar, Kumaon, U.P.), 610 m altitude.

1. Characters

This is a large, heavy species :

Adult size : See Table I.

Table I

Presbytis entellus schistaceous : Size of adults (lengths in mm). Range and average

Sex (and number of examples)	Head-and-body	Tail	Hind-foot	Ear
Males (5 exs.)	660–762 (av. 720·0)	914–991 (av. 957·0)	216–229 (av. 220·5)	50–51 (av. 50·5)
Females (7 exs.)	584–690 (av. 657·7)	700–940 (av. 837·9)	190–210 (av. 198·1)	38–46 (av. 40·6)
Both sexes (12 exs.)	584–762 (av. 688·8)	700–991 (av. 897·5)	190–229 (av. 209·3)	38–51 (av. 45·5)

Adult weight (kg) :

Males (3 exs.) 17.2 – 18.0 (av. 17.7); females (7 exs.) 14.0 – 18.0 (av. 15.8); both sexes (10 exs.) 14.0 – 18.0 (av. 16.4); females 89% of males. (Sugiyama, 1976, gave the weight of a male as 26.5 kg, which seems to be excessive as the example was not exceptionally large : head-and-body 745 mm, tail 910 mm).

General coat colour slaty or greyish, with buff tinge; hairs of the crown, whiskers and beard white and forming a characteristic white frame all around the head and face (Pls. 1-3). Limbs like the rest of body, not black. It differs from *P. e. ajax* and *P. e. entellus* which have black on parts of limbs and also differ markedly in tail carriage. Its nearest ally is *P. e. achilles* of Nepal which is darker but has a similar tail carriage. (Also see Figs. 4 and 5).

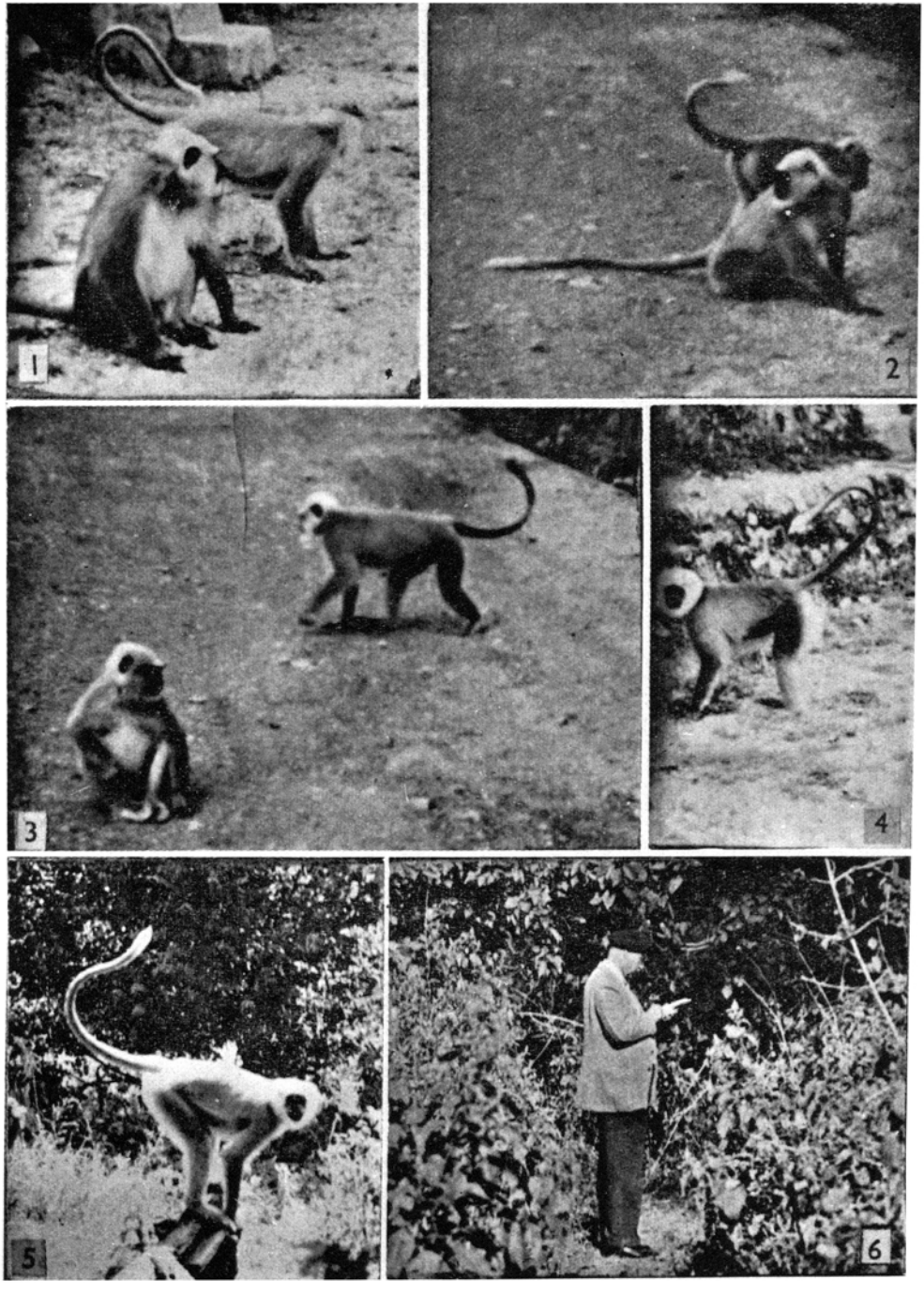

PLATE I. *Presbytis entellus schistaceous.* Tail carriage in normal or relaxed state (standing, walking). Tail curved forward, the tip remaining well above the level of the back. NW Uttar Pradesh: 1-4, Mussoorie (ex Makwana); 5, Bhim Tal (ex Vogel); 6, Chilla forest. Author taking field observations; dense vegetation hinders observation.

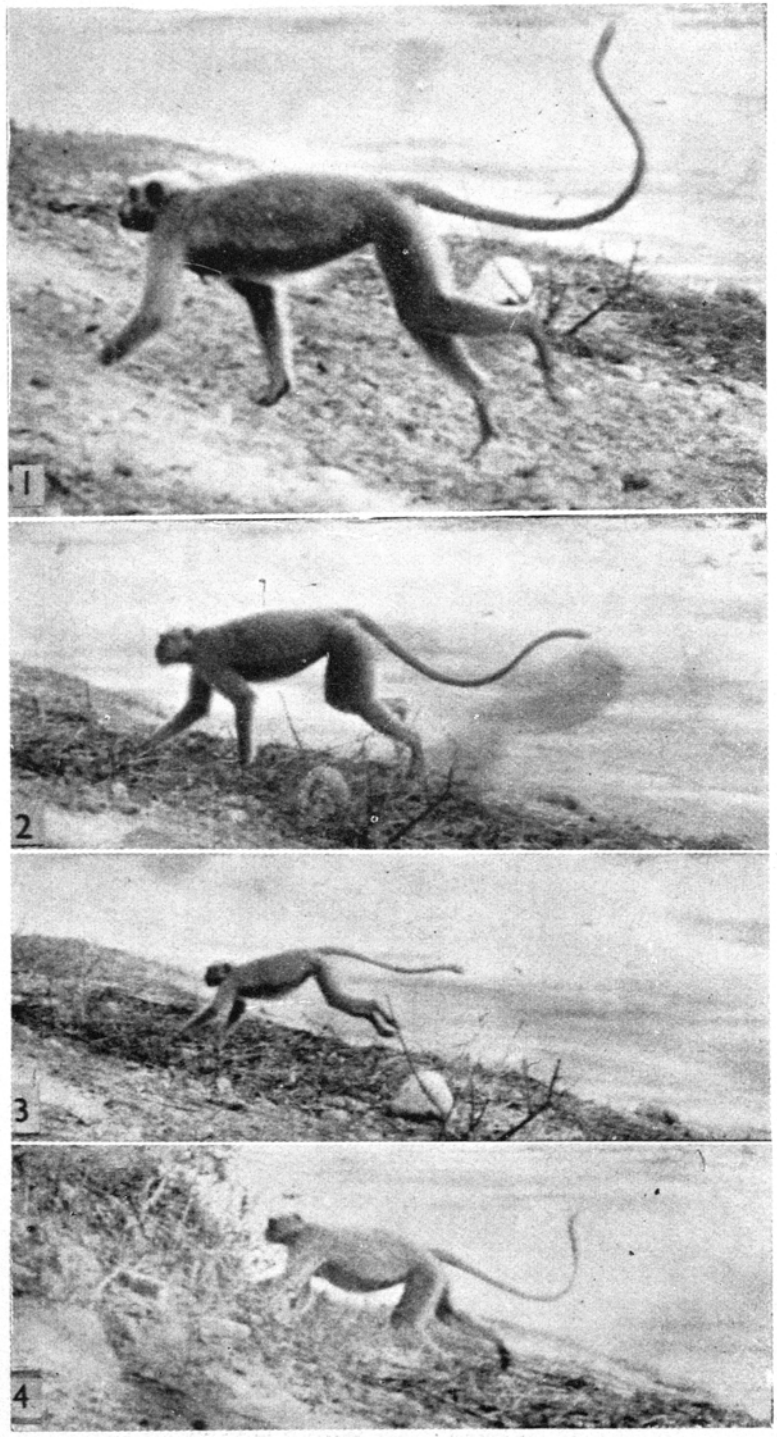

PLATE 2. *Presbytis entellus schistaceous.* Tail carriage under stress (running, leaping, going uphill). The tail arc or loop opens out (cf. Pl. 1). Amdanda, Corbett National Park. 1, Slow running; 2, Fast running; 3, Faster running and leaping; and 4, Climbing uphill.

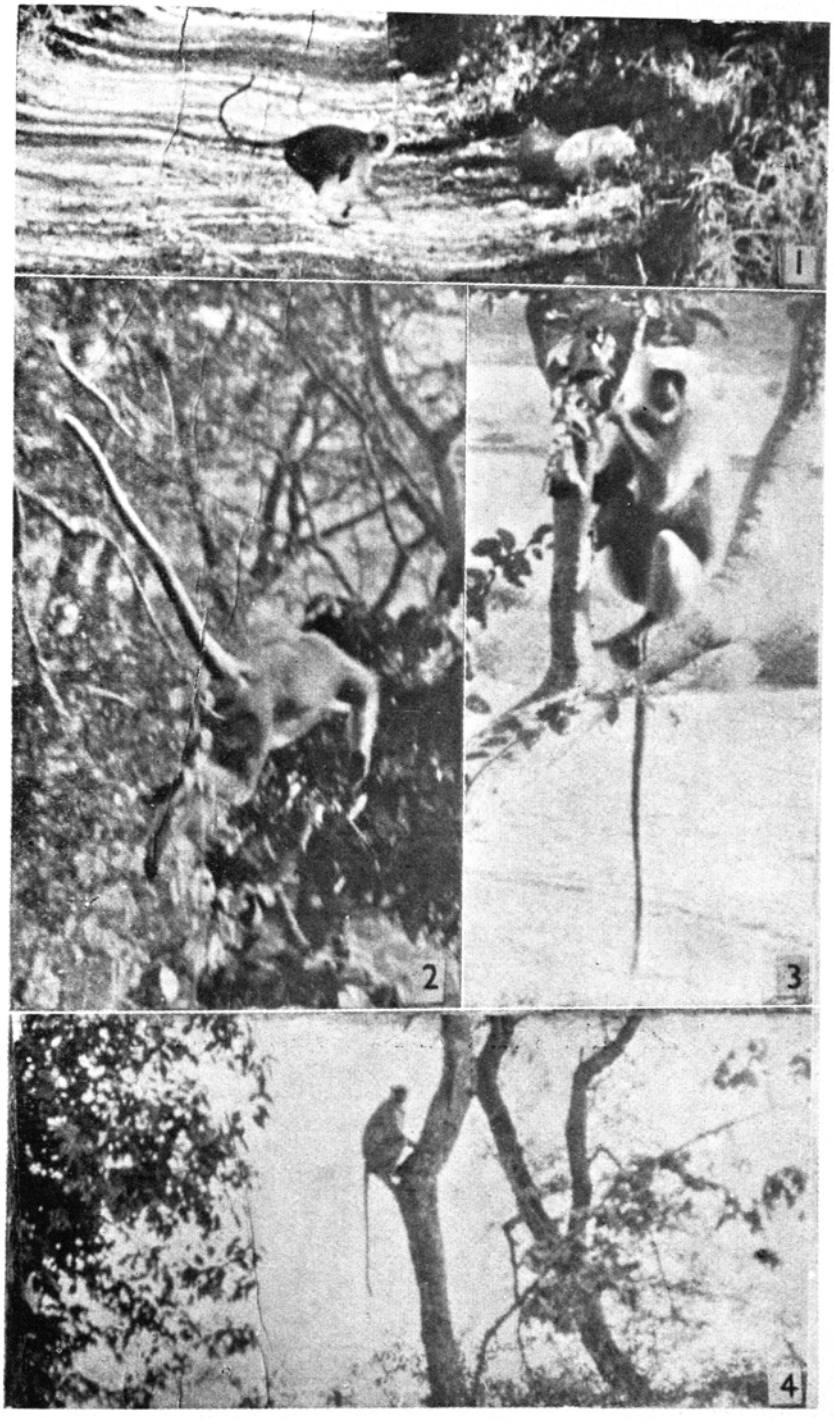

PLATE 3. *Presbytis entellus schistaceous*. Tail carriage under stress and in repose. NW Uttar Pradesh. 1, Running (Thano Forest, Dehra Dun District); 2, Leaping among trees (Dhikala, Corbett National Park). Tail straight and taut; 3, In repose, sitting on a tree—tail hangs limp (Amdanda, Corbett National Park); and 4, Same (Chilla Forest, Pauri District).

2. Geographical distribution

The general distribution is as follows:—Southern Himachal Pradesh (Simla Hills, etc.), north-western and northern Uttar Pradesh (Garhwal, Kumaon, Doon Valley, "Oudh" and the *Terai*), and the Nepal *Terai* and lower hills. From the plains up to c. 3,200 m altitude. (It is flanked by other subspecies as follows : On the NW by *ajax*, on the N and NE by *achilles* and on the S and SW by *entellus*.)

The detailed distributional records (Fig. 1) are as follows (Hodgson, 1840; Pocock, 1928, 1939; Ellerman and Morrison-Scott, 1951; Oboussier and Maydell, 1960; Vogel, 1970; Sugiyama, 1976; Roonwal and Mohnot, 1977; Roonwal, in press, a, b, and present account) :—

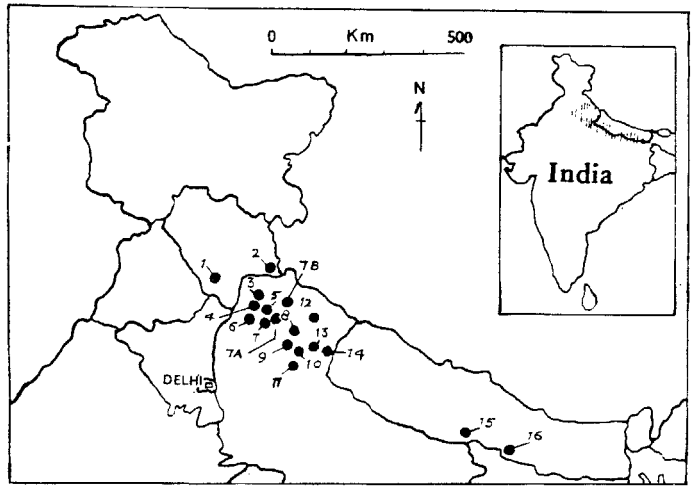

FIG. 1. Map of North India and Nepal, showing the distributional records of *Presbytis entellus schistaceous*. Inset : India, etc., showing the *schistaceous*-area (hatching). *Localities*: (1) Simla and vicinity (Simla, Tara Devi and Hotto), 1,500-3,200 m; (2) Molta, 3,000 m; (3) Mussoorie, *c.* 2,000 m; (4) Doon Valley (Asarori and Thano forests, *c.* 500-600 m); (5) Rishikesh; (6) Hardwar; (7) Chilla Wild Life Sanctuary; (7A) Rudraprayag; (7B) Chamoli District (Nandprayag, Mandal, Chopta, Phata); (8) Ratighat; (9) Dhikala (Corbett National Park); (10) Amdanda; (11) Sitabani, Ramnagar; (12) Almora; (13) Bhim Tal; (14) Champawat; (15) Nishangarh; and (16) Hazaria.

Himachal Pradesh

(1) Simla and vicinity (Simla, Tara Devi and Hotto, *c.* 31.06 N, 77.13E), 1,500-3,200 m altitude. Sugiyama (1976) regarded these Simla examples as *ajax*, but they are *schistaceous;* the tail carriage is also as in the latter and unlike *ajax*.)

(2) Molta : 3,000 m (*c.* 31.05 N, 79.00 E).

Uttar Pradesh

(3) Dehra Dun District : Mussoorie, *c.* 2,000 m (30.27 N, 78.06 E); Doon Valley, 500-600 m (*c.* 30.19 N, 78.04 E) : Asarori and Thano forests.

(4) Saharanpur District : Hardwar, 29.58 N, 78.13 E; Rishikesh, *c.* 20 km N of Hardwar.

(5) Pauri District (formerly part of Pauri-Garhwal) : Chilla Sanctuary, *c.* 300 m (near Hardwar, across the R. Ganga); Dhikala and vicinity (Corbett National Park), *c.* 386 m (29.39 N, 78.55 E); Rudraprayag, 610 m (see Addendum).

(6) Chamoli District (see Addendum).

(7) Almora District : Almora and vicinity, *c.* 2,000 m (29.37 N, 79.40 E).

(8) Naini Tal District : Amdanda (Corbett National Park), 300 m (*c.* 29.36 N, 79.10 E); Sitabani (near Ramnagar), 610 m (*c.* 29.20 N, 79.10 E), the type-locality of Pocock's *hector*); Ratighat, 1,127 m (*c.* 29.25 N, 79.25 E); Bhim Tal and vicinity, 1,100 m (*c.* 29.20 N, 79.30 E); Champawat (*hector*), 1,829 m (*c.* 29.20 N, 80.10 E).

(9) "Oudh" (mentioned by Ellerman and Morrison-Scott, 1951, but specific localities not given).

Nepal

(10) Nepal *Terai* and the lower hills (Hodgson's type-locality of *schistaceous* and *nipalensis*).

(11) Nishangarh, 600 m (*c.* 27.45 N, 83.50 E).

(12) Hazaria (Hajariya, Birganj District), 91 m (27.00 N, 85.25 E).

Tail Carriage

The tail of *P. e. schistaceous* is long and rope-like, thinner distally, and with a small, pointed tuft of terminal hairs. In length it is about 106–157 % (average 136.3 %) of the head-and-body, females having slightly longer tails than males as follows : Males 120-142 % (av. 133.0%) of head-and-body; females 106-157 % (av. 138.7 %).

Tail carriage was studied in adults (there is little constancy in infants and juveniles) in three different situations, e.g., the normal or relaxed state (standing, walking), under stress (running, going uphill, fighting), and in repose (sitting).

1. *In the Normal or Relaxed State* (Fig. 2; and Pl. 1)

While standing or walking, the tail is generally carried up in a forward arc or loop. The proximal part may be oblique-up (rarely oblique-down) or horizontal. In the oblique-up position (Figs. 2a-c), the tail generally arches over the back to a greater or lesser extent. In other positions (Figs. 2d-h), it stretches away from the body, and the loop does not arch over the back but behind it. (The extreme distal end sometimes shows a small upward and backward bend, but this feature is not constant). Within the limits shown in Fig. 2, variations in tail carriage may occur in animals of the same group, as noted for example at

Mussoorie, Amdanda, etc., and sometimes even in the same individual at different times.

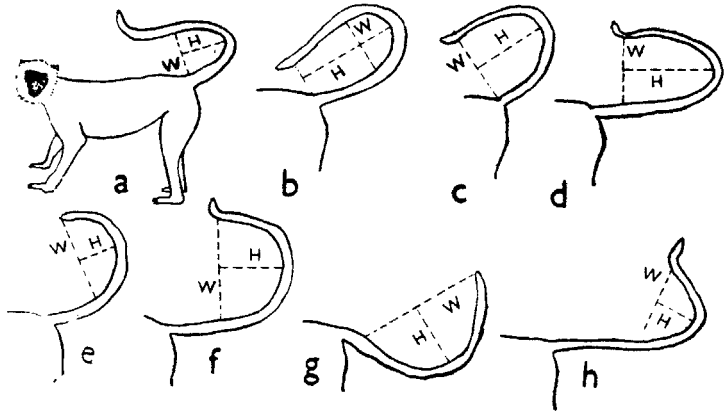

FIG. 2. Normal or relaxed (standing, walking) tail carriage in *Presbytis entellus schistaceous*. These types may occur in the same group, sometimes in the same individual. Also indicated in the figure are the points for measuring the maximum width (W) and the maximum height (H) of the tail arc or loop to determine the Loop Index (W/H).

As measured in lateral photographs, different parts (distal, proximal, or middle) and proportions of the tail may take part in the arc or loop formation (Fig. 3). Thus, the arc or loop may be formed by about 73–88% of the distal part, 60–90% of the proximal part, varying parts (about 57–60%) of the middle, or the entire tail.

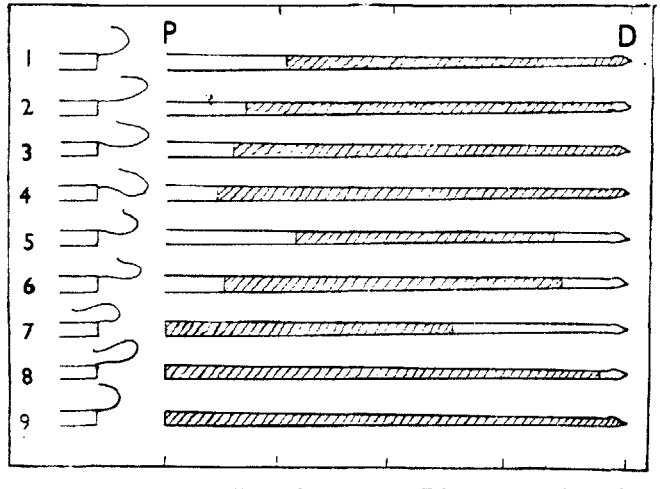

FIG. 3. *Presbytis entellus schistaceous*. Diagram to show that different portions (distal, proximal or middle) and proportions of the tail may take part in the arc or loop formation (line shaded portion) in different types of tail carriage (1-9).
P, proximal and *D*, distal end of tail.

Loop shape and index (Figs. 2 and 3): The loop shape varies from long and pitcher-shaped (with a narrow to wide mouth) to cup-shaped and bowl-shaped (with a wide mouth). The shape can be measured in lateral photographs in terms of the maximum width (W) and the maximum height (H), and expressed as a Loop Index (W/H) which varies from about 0.3 to 2.0, being low (up to *c.* 0.5) when the loop is long, and gradually rising to 2.0 as the loop becomes wide and shallow.

2. *Under stress* (Pls. 2 and 3)

Under stress situations (running, steep climbing, leaping, and in mutual fights), the tail curvature tends to open out and the tail stretches in a semi-taut state behind the animal, with the curve either entirely gone and the tail straight, or the remnants of the curve are still partly visible as a weak, gentle arc. When the stress is over, the tail resumes its normal, relaxed state.

3. *In repose* (Pl. 3, Figs. 3 and 4)

In repose, in a sitting animal, the tail either stretches on the ground behind the animal in an irregular fashion, or hangs down limp and straight (as in animals sitting on a ledge or on a tree branch). It is in this latter state that infants and juveniles often use each other's or adults' tails for play-climbing.

Discussion

Geographical, subspecific and clinal variations have recently been discovered in *Presbytis entellus*, and two main groups of subspecies have been recognised (Roonwal, in press, b): I (a Northern) in which the tail is bent forward, and II (a Southern) in which it is bent backward (Fig. 4). Further subcategories occur : IA (subspecies *ajax* and *entellus*) in which the tail tip reaches up to, and even well below, the back; and IB in which the tip remains well above the back (*schistaceous* and *achilles*).

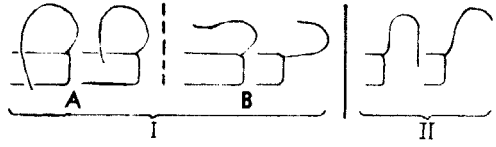

Fig. 4. Two principal types of tail carriage in *Presbytis entellus* subspecies. I. Tail curved forward. (A, tip reaching up to, or even below, the back: subspecies *entellus* and *ajax*. B, tip remaining well above the back: subspecies *schistaceous* and *achilles*). II. Tail curved backward: several subspecies in Peninsular India.

Tail carriage in *P. e. schistaceous* differs from that in *P. e. entellus* (the only other subspecies in which it has been studied in detail) in a number of characters: (1) The tail tip does not reach the back but remains well above it. (2) The tail may or may not arch over the body, and may be directed away from the latter.

(3) The tail loop is very open, much more so than in *P. e. entellus*. (4) The extreme tip of the tail is not directed downward but is directed either subhorizontally forward or, sometimes, upward and backward when the extreme distal end forms a tiny arc.

Tail lengths also differ in the two subspecies. In *P. e. schistaceous*, as stated above, it is 106-157% (average 136.3%) of the head-and-body length, while in *P. e. entellus* it is about 14% longer, being 123–190% (av. 156.6%) of the head-and-body. The relative shortness of the tail in *P. e. schistaceous* may thus be correlated with the phenomenon of the tail not reaching the back, while doing so in *P. e. entellus*.

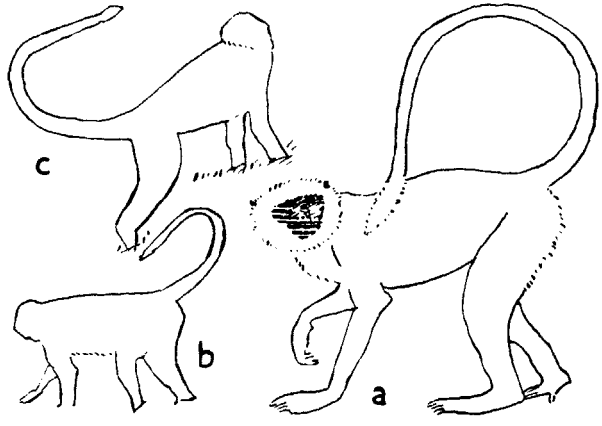

FIG. 5. Normal or relaxed tail carriage in three subspecies of *Presbytis entellus*. *(a) P. e. ajax* (NW Pakistan). *(b) P. e. schistaceous* (Simla, India). (c) *P. e. achilles* (Nepal). (*Adapted from:* **a**, *Roberts;* **b**, *Sugiyama [his ajax];* **c**, *Bishop).*

Among the neighbouring subspecies, *P. e. achilles* (Fig. 5c), of the higher altitudes of Nepal (see Bishop, 1975, Fig. 2), is the only one whose tail carriage is similar to that of *P. e. schistaceous*. Another neighbour, to the northwest, *P. e. ajax* (Fig. 5a), has an *entellus*-type of tail carriage (see Roberts, 1977, p. 88, Fig. 17). The Simla examples (Fig. 5b) of *P. e. schistaceous* (which Sugiyama, 1976, regarded as *ajax*) have a tail carriage which is typical of *schistaceous* from other areas (Kumaon, Garhwal) and very unlike *ajax*, as is evident from Sugiyama's Fig. 7.

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Addendum

Dr. S. C. Verma has kindly sent me his field notes (June 1978) from the Garhwal Himalayas, Uttar Pradesh. He found this langur up to 2,680 m altitude in the following places :— Pauri District : Rudraprayag, 30.17 N, 79.00 E, 610 m. Chamoli District : Nandprayag, 30.20 N, 79.21 E, 900 m; Mandal, 30.27 N, 79.17 E, 1,490 m; Chopta, 30.27 N, 79.11 E, 2,680 m; and Phata, 30.35 N, 79.03 E, 1,525 m. In all these places the tail in the relaxed state (standing, walking) was as in Fig. 2 h above, with the loop-mouth wide or narrow.