Rec. zool. Surv. India, **79** : 125-158, 1981

INTRASPECIFIC VARIATION IN SIZE, PROPORTION OF BODY PARTS AND WEIGHT IN THE HANUMAN LANGUR, *PRESBYTIS ENTELLUS* (PRIMATES), IN SOUTH ASIA, WITH REMARKS ON SUBSPECIATION

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(With 10 Tables, 5 Text-figures and 1 Plate)

INTRODUCTION

The Hanuman langur, *Presbytis entellus* (Dufresne) (Primates, Cercopithecidae, Colobinae), is one of the most common and widespread Primates in South Asia, extending in the north from NW Pakistan, the whole of India, Nepal, Bhutan, and Southern Tibet to Sri Lanka in the south ; also to Bangladesh. It is highly adaptable, being found in the Himalayas up to about 3,660 m altitude (well below the snow line, 4,270-5,790 m), in all types of forests (except dense rain forest), scrub and semi-desert areas, and on the outskirts of towns and villages. It shows considerable intraspecific variation in body size, weight, coloration, tail carriage, etc., and numerous subspecies have been recognised.

Information on intraspecific variation in body size, proportion and weight is widely scattered and has never been properly analysed. In the present account I have assembled the available information, with the addition of fresh data. These have been examined from the point of view of subspecific and geographical variation, sexual dimorphism and subspecies relationships.

MATERIAL AND METHODS

1. *General*

Only adult data have been considered ; subadults, and individuals where all the molars have not yet fully erupted have been ignored. Sizes are from flesh measurements in freshly killed examples. (In a few cases, measurements from made-up museum skins are given in the literature ; these have been ignored since they cannot be accurate.) Weights too are largely from freshly killed examples. (In some, cases, e.g., *P. e. entellus*, Mohnot, personal communication, live

weights are available. They were taken with a spring balance attached to a platform and hung from a tree, with the animal attracted to it by food offer ; the balance needle was watched from a distance with the aid of a pair of field binoculars. Only females were thus attracted ; males would not mount the platform.)

The standard parameters of length measurement are as follows, with the concerned body part fully relaxed and pressed against a flat surface to obtain straightline distances (not along the curvatures) :— *Head-and-Body* : From the front of the head (upper lip) to the ventral root of the tail. *Tail* : From the ventral root of the tail just above the anus to the tip of the tail vertebrae, excluding the end-hairs. *Length of hind-foot* : From the outer, most prominent surface of the heel to the tip of the longest toe. *Length of ear* : From the most prominent surface of the tragus to the farthest edge of the pinna. (The ear measurements are generally less accurate than those of the other parts because of the smallness of the part and the 'approximate' recording of data in the field by several observers, e.g., '1½ inches', '1⅔ inches', etc.).

2. *The subspecies*

Fifteen subspecies have been recognised, their distribution (Taxt-fig. 1) being as follows (Pocock, 1928a, b, 1939 ; Ellerman and Morrison-Scott, 1951 ; Roonwal and Mohnot*, 1977 ; and Roonwal, present account) :—

1. *P. e. achates* (Pocock). S. India : Karnataka (Dharwar, Bellary, Kanara, etc.) ; Goa.

2. *P e. achilles* (Pocock) (syn. *schistaceous* Blanford, *nec* Hodgson). Nepal and Sikkim ; also Bhutan (?). At high altitudes, up to about 3,660 m.

3. *P. e. aeneas* (Pocock). S. India : Karanataka (S. Coorg : Makut and Wottekolli, up to about 610 m).

4. *P e. ajax* (Pocock). NW Pakistan (Hazara District) and NW India (Kashmir and northern Himachal Pradesh ; examples from Simla and vicinity are *P. e. schistaceous*). At high altitudes.

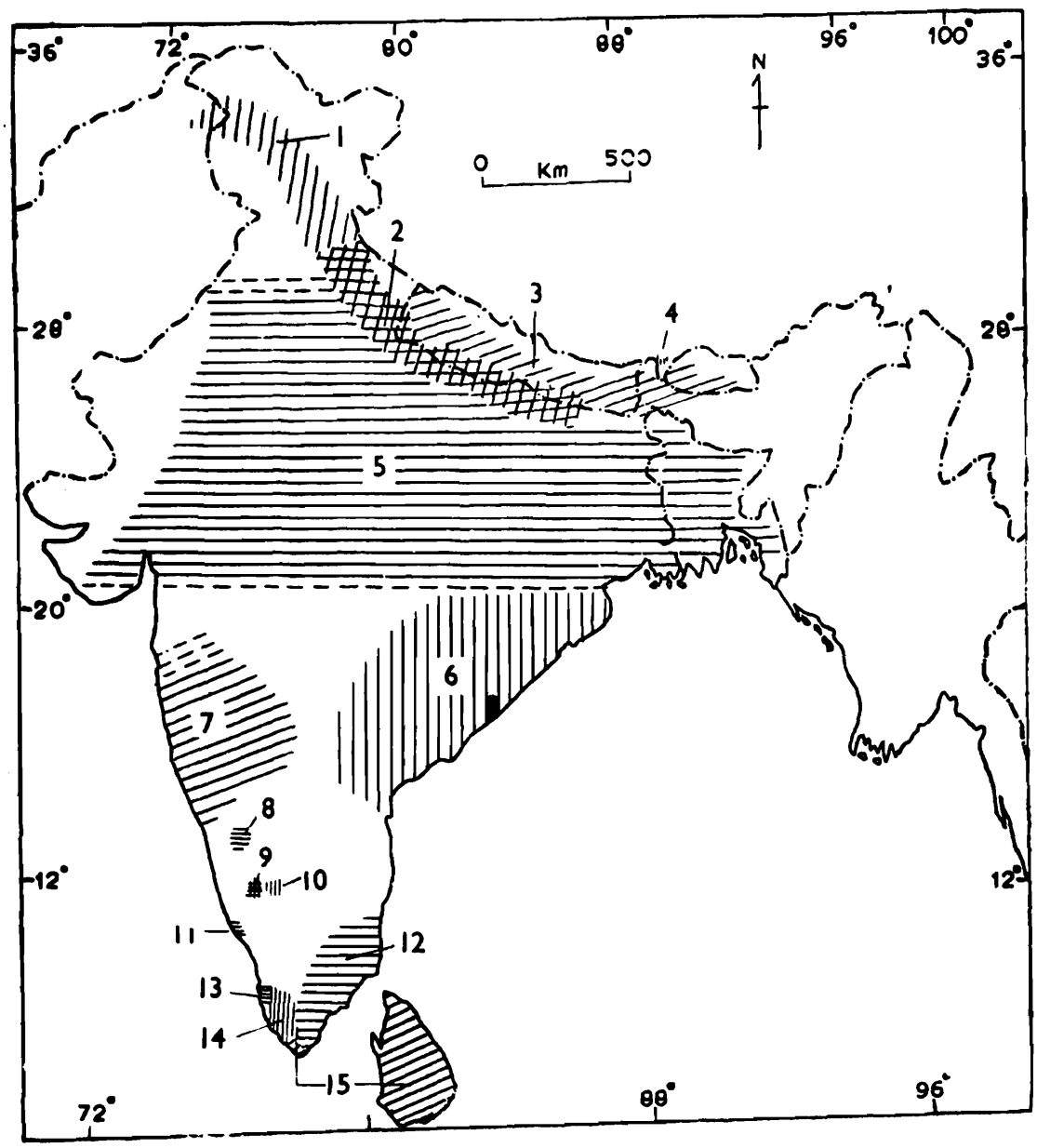
5. *P. e. anchises* Blyth. Andhra Pradesh (Kurnool ; the Eastern Ghats) southern Madhya Pradesh and northern Maharashtra.

*These authors list a sixteenth. *P. e. shanicus* (Wr.) from Upper Burma, but this is best relegated to Phayre's Leaf Monkey, as *P. phayrei shanicus* (Wroughton).

6. ***P. e. dussumieri*** (I. Geoffroy). S. India (Malabar Coast : probably Mahe).

7. ***P. e. elissa*** (Pocock). S. India : Karnataka (SE Coorg : Nagerhole). At higher elevations, above about 610 m.

8. ***P. e. entellus*** (Dufresne). N. India (Gujarat, Rajasthan and Madhya Pradesh to W. Bengal and Orissa. (Absent in the extreme deserts of Western Rajasthan.) Also Bangladesh.



Text-fig. 1.—South Asia, showing the approximate distribution of various subspecies of *Presbytis entellus* ; 1. *ajax*. 2. *schistaceous* (syns. *hector* and *nipalensis*). 3. *achilles*. 4. *lania*. 5. *entellus*. 6. *anchises*. 7. *achates*. 8. *iulus*. 9. *aenaeas*. 10. *elissa*. 11. *dussumieri*. 12. *priam* (syns. *pallipes* and *priamus*). 13. *priamellus*. 14. *hypoleucos*. 15. *thersites*.

9. ***P. e. hypoleucos*** (Blyth). S. India : Kerala (Travancore).

10. ***P. e. iulus*** (Pocock). S. India : Karnataka (Jog, Gersoppa Falls, Shimoga District).

11. *P. e. lania* Elliot. Extreme S. Tibet (Chumbi Valley, near Sikkim).

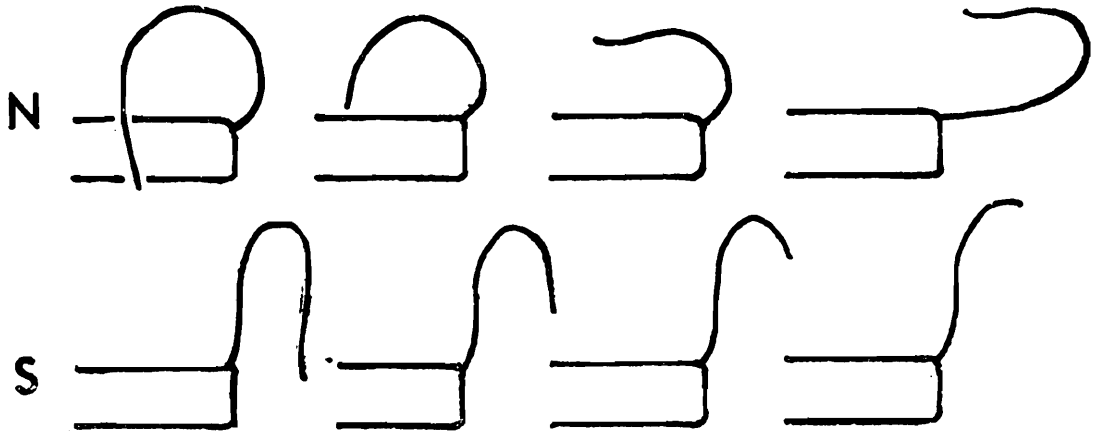
12. *P. e. priam* (Blyth) (syns. *pallipes* Blyth and *priamus* Blyth). S. India : Tamil Nadu ; also southern Kerala (Mahendragiri Range).

13. *P e. priamellus* (Pocock). S. India : Northern Kerala. (Shernelly, Cochin).

14. *P. e. schistaceous* (Hodgson, *nec* Blanford) (syns. *nipalensis* Hodgson and *hector* Pocock). Southern Himachal Pradesh (Simla and vicinity), northern Uttar Pradesh (Oudh, Kumaon, Garhwal, and the *terai*) and the Nepal *terai*.

15. *P e. thersites* Blyth. Sri Lanka ; also extreme south of Peninsular India (southern Kerala ; also probably the southern tip of Tamil Nadu).

Two genetic groups : As shown elsewhere (Roonwal, 1979), these subspecies fall into two natural groups on the basis of the mode of tail carriage, viz., a Northern Group and a Southern Group, with



Text-fig. 2.—Different types of tail carriage in *Presbytis entellus*. Diagrammatic. N, in the Northern Group of subspecies (tail curved forward, the tip reaching or not reaching :the back). S, in the Southern Group of subspecies (below about 20° N latitude ; the tail curved backward, the loop varying from deep to shallow).

the dividing line roughly around 20° N latitude. In the former group the tail is curved forward, in the latter backward (Text-fig. 2) ; the difference is evidently genetically determined. The subspecies included in the two groups, and generally arranged north to south, are as follows :— Northern Group : *ajax*, *schistaceous*, *achilles*, *lania* (?), and *entellus*. Southern Group ; *anchises*, *achates*, *iulus*, *aeneas*, *elissa*, *dussumieri*, *priam*, *priamellus*, *hypoleucos* and *thersistes*.

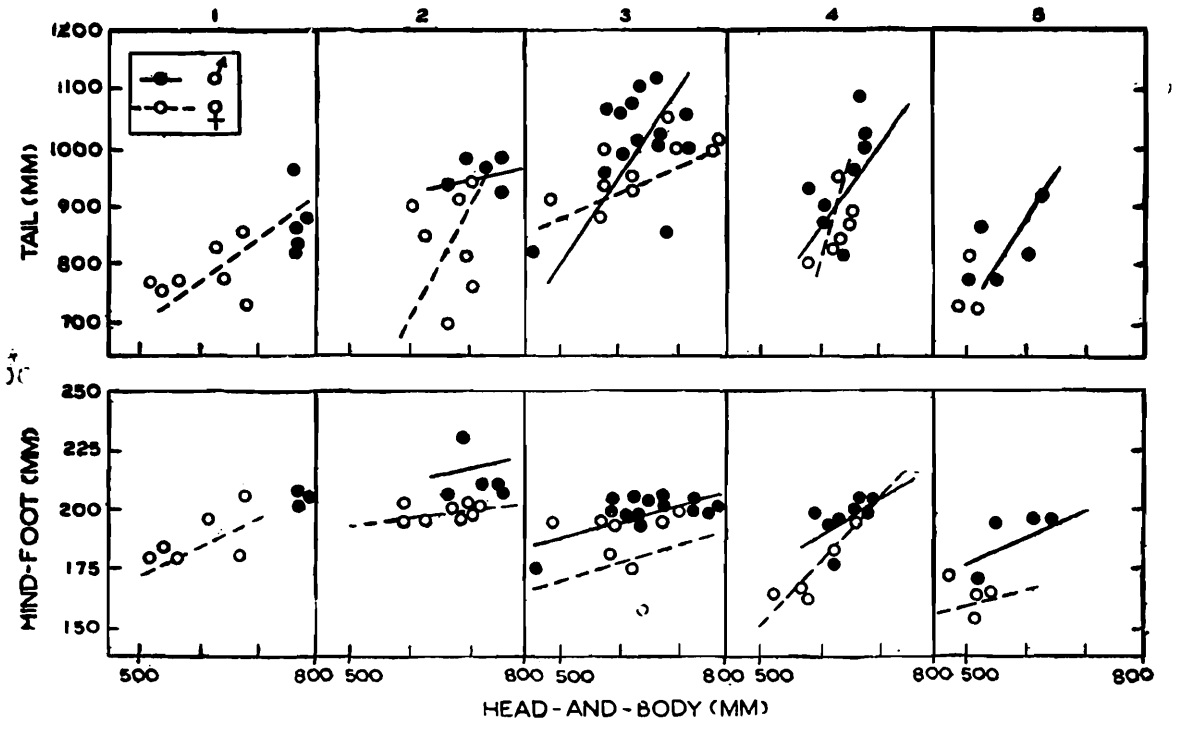
SIZE AND PROPORTION OF BODY PARTS

1. *Size of body parts*

The overall range and averages (lengths in mm) for the species are as follows (for details, see Tables 1 and 2).

	Head-and-Body	Tail	Hind-foot	Ear
Range :	451-787	660-1,118	152-229	35-51
Average :	636.1	884.3	189.5	43.9

On an average, the Northern Group of subspecies (see above) is distinctly larger than the Southern (Table 3). In the former group the head-and-body is 113%, the tail 102%, the hind-foot 118% and the ear 106% of the latter. Within the Northern Group, the Himalayan subspecies (*ajax*, *schistaceous* and *achilles*) are larger (averages for head-and-body 635.0—688.8 mm) than the widespread, plains-dwelling subspecies *P. e. entellus* (av. 638. 9 mm) ; data for the restricted



Text-fig. 3.—*Presbytis entellus*. Graphs, to show that the lengths of tail and hind-foot increase directly with that of head-and-body. *Subspecies*: 1. *ajax*. 2. *schistaceous*. 3. *entellus*. 4. *achates*. 5. *thersites*.

Tibetan subspecies, *lania*, are scanty. In the Southern Group, the average length of head-and-body ranges from 543.6 mm (*thersites*, Sri Lanka) to 673.0 mm (*aeneas*), the former or extreme southern subspecies being the smallest. A distinct north-south clinal trend is noticeable within this group, the Upper Peninsular subspecies being larger

than those at the extreme southern end. The same general trend is noticeable, though to a lesser degree, in the hind-foot and ear.

The tail length, however, presents different and interesting features. First, within the individuals of the five subspecies for which adequate data are available (*ajax*, *schistaceous*, *entellus*, *achates* and *thersites*), the tail length increases directly with the head-and-body (Text-fig. 3). Secondly, the north-south size trend, which is generally noticeable in head-and-body, is no longer evident in the tail. The shortest tails are found in the extreme north (in the Himalayan subspecies *ajax*, *schistaceous* and *achilles* : averages : 825.2, 897.5 and 811.0 mm respectively) and again in the extreme south (*thersites*, 809.8 mm). The longest tail is found in the plains-dwelling *P. e. entellus* (803-1,118 mm, average 987.4). The subspecies occuring in the intervening area range, on an average, from 813.0-978.0 mm.

Sexual dimorphism (Table 4).—Data are available for 9 subspecies of both the Northern and the Southern Groups. Females generally tend to be smaller than males. Dimorphism is most marked in the three extreme northern, mountain subspecies (*ajax*. *schistaceous* and *achilles*) where females are about 10%—20% smaller than males ; the extreme southern subspecies, *thersites*, shows a nearly similar, though weaker, trend. In the widespread subspecies, *entellus* of the North Indian plains, the sexes are subequal, and the same general feature is noticeable in the remaining subspecies of Peninsular India.

2. *Proportion of body parts*

The overall species range and averages for the proportion of body part lengths (as percentages of the length of head-and-body) are as follows (for details see Table 5) :—

	Tail (%)	Hind-foot (%)	Ear (%)
Range :	106-190	21-39	5-9
Average :	143.9	29.95	7.1

The tail is always longer (slightly to considerably, almost twice) than the head-and-body, being, on the average, about one-and-a-half times longer. Between the Northern and Southern Groups of subspecies as a whole, the tail is, on an average, shorter in the former (133.6% versus 147.5% of head-and-body, see Table 6). It is shortest (averages 121.3%—136.3% of head-and-body) in the three extreme northern subspecies (*ajax*, *schistaceous* and *achilles*), and longest in the plains-dwelling *entellus* (156.6%). In the Peninsular Indian subspecies also the tail is proportionately long, around 150% of head-and-body, sometimes a little longer.

Like the tail, the hind-foot is also the shortest (average c. 30% of head-and-body) in the three northernmost species (*ajax*, *schistaceous* and *achilles*), and the longest in *entellus* and *thersites* (32.2% and 32% respectively). The ear proportions show no definite trends.

Sexual dimorphism (Table 7).—Sexual dimorphism in tail proportion is well marked in the two northern subspecies, *ajax* and *schistaceous*, females having makedly longer tails (14% and 6%) than males in relation to head-and-body, and this female superiority is repeated for the three extremely southern subspecies, *aeneas*, *priam* and *thersites* (females 6%—12% longer than males). In other subspecies, tails in females are slightly smaller than in males (6%—12%).

In the hind-foot also, the Himalayan subspecies have strong dimorphism, again in favour of females (*ajax* 3%, *achilles* 2% longer than males) ; in the others it is less strongly marked. In the ear the there seems to be no definite trend.

BODY WEIGHT

Subspecies data on body weight are widely scattered and are brought together in Table 8, along with new data, and information on 11 of the 15 known subspecies is thus provided. (No information is available for the restricted Tibetan subspecies, *lania*, and for three equally restricted Peninsular Indian subspecies, *dussumieri*, *priamellus* and *hypoleucos*.) The overall range for the species thus obtained is as follows (in kg) :—

	Males	Females	Both sexes
Range :	9.0-20.9	5.9-18.0	5.9-20.9
Average :	15.3	11.3	12.6

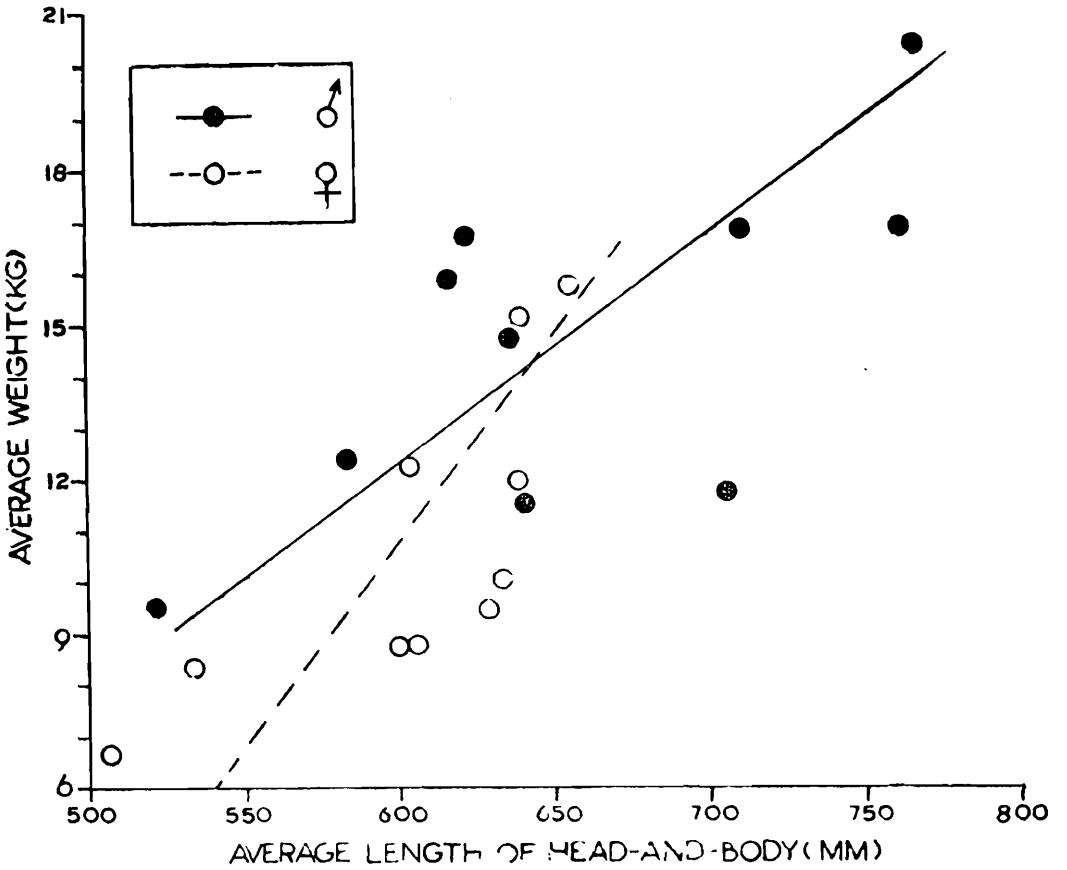
As with body size, in adult weight also the subspecies fall into two groups—a Northern and a Southern (Tables 9 and 10). Members of the Northern Group are heavier on an average, about 35% among males and 55% among females. The three northernmost Himalayan subspecies (*ajax*, *schistaceous* and *achilles*) are the heaviest (average 17.7, 16.4 and 16.3 kg respectively), a condition which recalls their size superiority. The plains subspecies, *entellus*, is smaller (av. 12. 5 kg), while the averages in the Peninsular subspecies range from about 8.95-12.80 kg, but there is no indication of a north-south gradation as occurs in size. The plains subspecies, *entellus*, presents interesting features. Populations in Western India seem to be somewhat heavier

than those from the east, as follows (weights in kg) [Also see Addendum, p. 138] :

		Males	Females
Rajasthan	Jodhpur and vicinity	—	11.5-14.0 (av. 13.2)
	Mt. Abu	Av. 18.2	Av. 11.2
W. Bengal	(Midnapur)	15.8 (1 ex.)	Av. 11.3

Interesting also are the very light examples from Muki (Balaghat, Madhya Pradesh, near the southern extremity of the range of *P. e. entellus*) which weigh only 9.2-10.5 kg (av. 9.7) ; also see below.

Sexual dimorphism (Table 9).—In all subspecies females are lighter than males, but the extent of dimorphism differs. It is most marked in the northernmost subspecies, *ajax* (females weigh about 63% of



Text-fig. 4.—Graph to show the direct relationship of body-size (length of head-and-body) with body weight in adults of *Presbytis entellus* (averages in various subspecies) ; the weight increases with body-size.

males) and again in those of the extreme south (*priam* and *thersites*, 55% and 56%). In others it is relatively weak, females weighing c. 70%-98% of males. The least dimorphism is evident in the Nepal subspecies, *achilles*, 98% (Bishop, 1975, gave the average as 83%).

Correlation of weight with body-size.—On an average, the weight increases directly with body size (length of head-and-body, Text-fig. 4), the increase being steeper in females than in males.

THEORETICAL CONSIDERATIONS

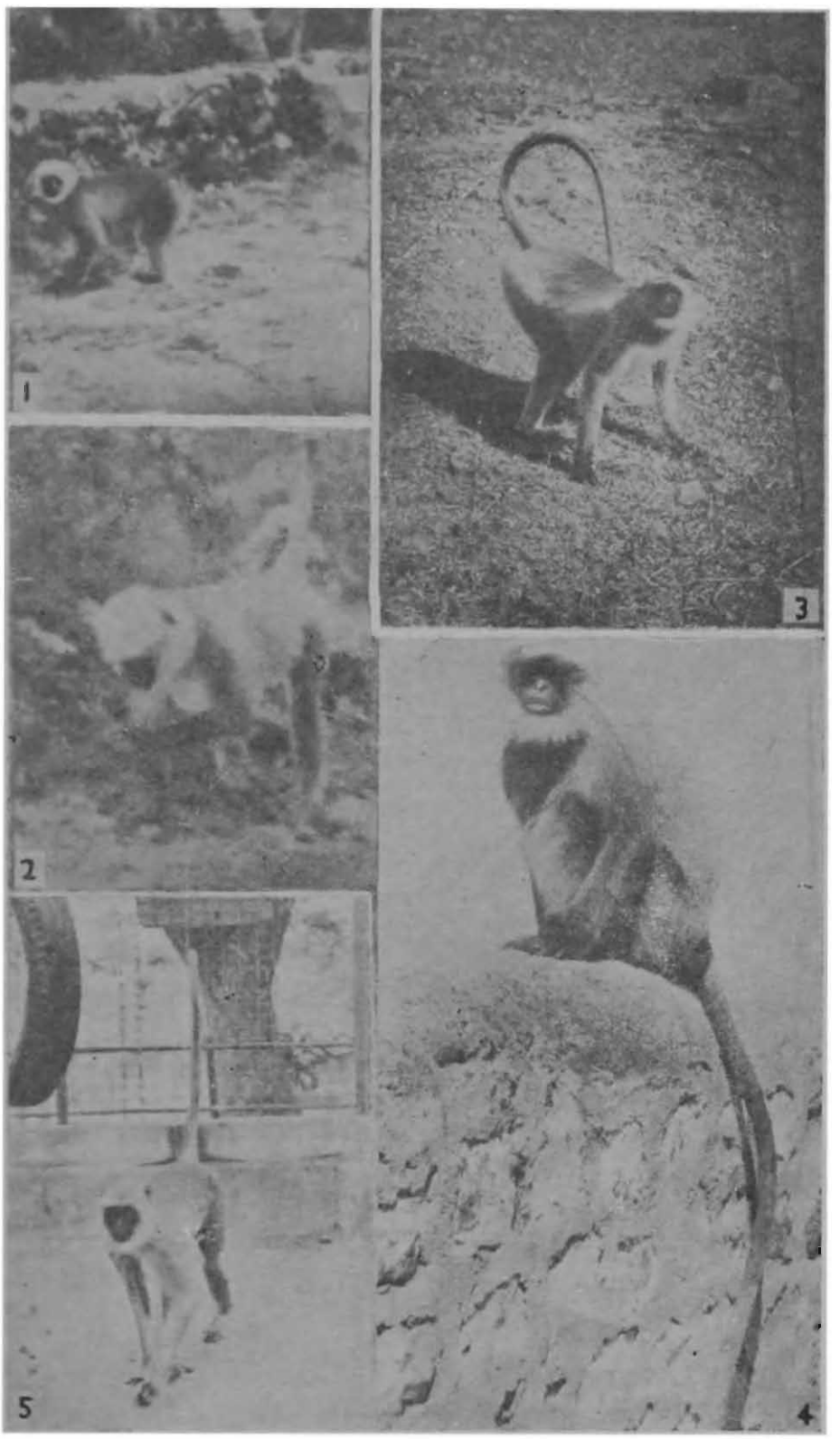
The total land area over which *Presbytis entellus* is distributed in South Asia is very roughly about 3,084,800 km^2 (see Text-fig. 1). Over this vast area, however, the distribution is spotty, subject no doubt, among other things, to the existence of suitable ecological habitats. Only a fraction of the overall area is thus actually occupied, and the actual extent of these patches can only be a matter of guesswork. Some idea of the patchiness can be obtained from the isolated and rather concentrated population of *P. e. entellus* around Jodhpur at the eastern fringe of the Great Indian Desert. This population, consisting of about 900 heads organised in 32 groups (both unimale-bisexual and all-male), ranges over an area of about 50 km^2, but the actual groups occupy roughly only about 30%-40% of this area. This is an exceptionally concentrated population, and there are no langurs within a hundred-kilometer radius around. Population concentrations in other regions are far more patchy and localised.

Of the vast distributional area of 3.08 million km^2, about 42% is occupied by a single subspecies, *P. e. entellus*, which covers the entire North Indian plains (Text-fig. 1). The remaining 14 subspecies individually occupy much smaller areas, some probably no more than a few hundred square kilometers. This fact is of interest in the working of the mechanisms of migration, gene flow and subspeciation. Over the extensive *P. e. entellus* area (some 1,280,000 km^2) there are no migration barriers and the large population has become fairly uniform. North and south of this area, however, the country is largely mountainous and thinly to densely forested, resulting in the splitting of populations into numerous small or large pockets. Isolation mechanisms and genetic drift (the Wright-Dubinin Effect) working on these populations of varying sizes have evidently resulted in considerable subspeciation, as is noticeable along the Himalayas (four subspecies) and in the Peninsula and Sri Lanka (ten subspecies).

As shown elsewhere (Roonwal, 1979), the species is grouped, on the basis of tail carriage, into two main genetically divergent groups, viz., a Northern Group with a forwardly curved tail and a Southern Group with a backwardly curved tail (see above, and Text-fig. 2).

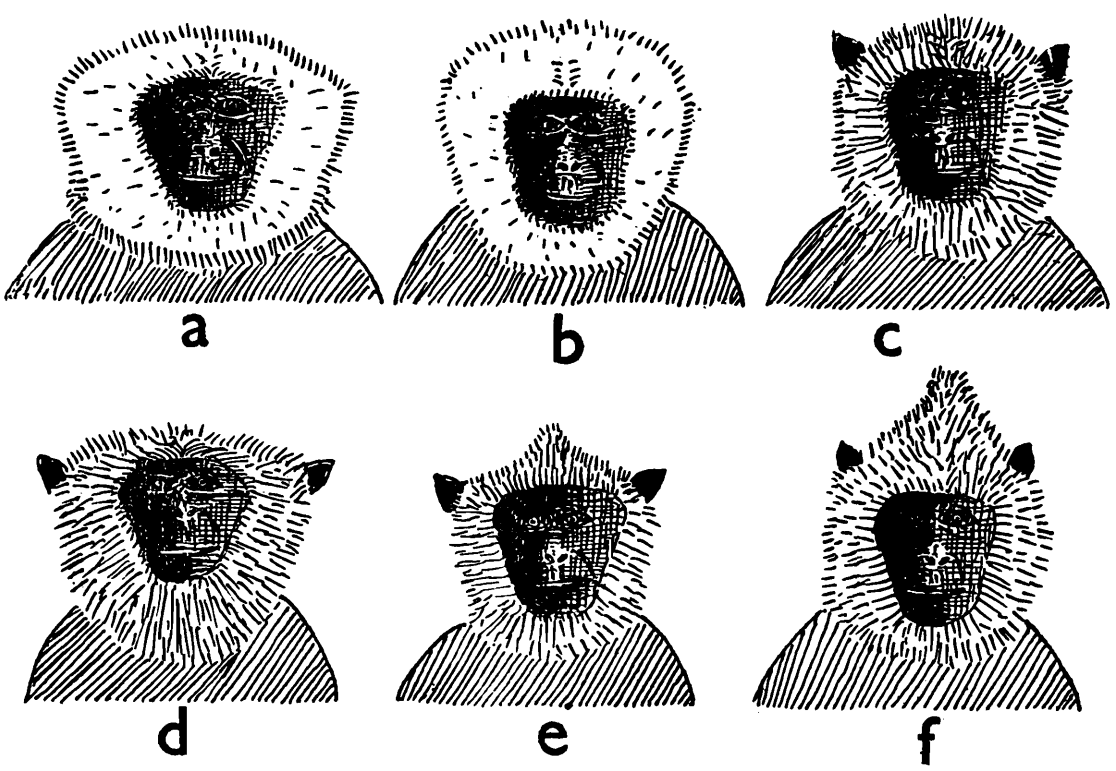
We may now consider the relationships of the various subspecies, as determined on the basis of size, weight, and tail carriage, as well as the characters used by the taxonomists, such as the extent of black on the limbs and the extremites, the side whiskers, the hair tuft on the crown, etc. (Text-fig. 5 and Pl. 2).

ROONWAL PLATE II



Photographs of subspecies of the Hanuman Langur, *Presbytis entellus* (Durfresne). Subspecies: 1. *schistaceous*, ♂ (Mussoore, U. P.). 2. Same, ♀ 3. *entellus* (Debari near Udaipus, Rajasthan). 4. *achates* (Pune, Maharashtra). 5. *priam* (ex Mudaimalai Sanctuary, Tamil Nadu, in Madras Zoo).

The northernmost or Himalayan subspecies, *ajax*, *schistaceous* and *achilles* (little is known of the Tibetan *lania*), are characterised by several common features, e. g., long, white side whiskers, large size, heavy weight, relatively short tails (length c. 121%-136% of head-and-body) and strong sexual dimorphism in size and weight (females are much smaller and lighter than males). But *ajax* is exceptional and also shows affinities with the plains-dwelling *entellus* in at least two respects : The forwardly curved tail reaches well below the back (in *schistaceous* and *achilles* the tail tip remains well above the back) ; and the presence of black on the distal half of the arms (in *schistaceous* and *achilles* the limbs have no black, while in *entellus* the hands and feet are black). *P. e. entellus* is also characterised by the longest tail (c. 157% of head-and-body) which is curved forward, the tip reaching well below the back ; and sexual dimorphism in body size is weak. In size and weight *P. e. entellus* occupies a nearly intermediate position between the northern and the southern subspecies. Among the latter, a north-



Text-fig. 5.—Heads of some subspecies of *Presbytis entellus*. Note variation in side whiskers and the tuft of haris on the crown. (a) *ajax* (Chamba, H. P.). (b) *schistaceous* (Mussoorie, U. P.). (c) *entellus* (Jodhpur, Rajasthan). (d) *achates* (Pune, Maharashtra). (e) *priam* (Nilgiri Hills, T. N.). (f) *thersites* (Sri Lanka).

south genoclinal trend is noticeable, the extreme southern subspecies being generally the smallest.

The subspecies of the Western Ghats are characterised by the presence of black on the extremites (*achates*, *iulus*, *aeneas*, *dussumieri*, *hypoleucos*, *elissa*), while those of the Eastern Ghats and Sri Lanka lack

this feature (*anchises, priam, thersites*) ; *priamellus*, of the western side, seems to be an exception.

Three of the southernmost species are characterised by the presence of a hair tuft on the head (*elissa*, *priam* and *thersites*). This character seems to show clinal variation. The tuft is small in *elissa* and *priam* and tallest in the southernmost subspecies, *thersites* (Text-fig. 5).

Extremely light and small forms : In the *P. e. entellus* group, at the southern extremity of its range (Muki, Balaghat, Madhya Pradesh), Oboussier and Maydell (1960) recorded very light examples (males weigh only 55% and females about 87% of examples from other parts of the subspecies range, see Table 1). But they are not correspondingly small in size, and their exceptional lightness is inexplicable. In the south (High Wavy Mountains, Madurai District, Tamil Nadu), Hutton (1949) observed an exceptionally small form which was grey, with black nape and white underparts ; actual measurements were not given.

ACKNOWLEDGEMENTS

I am indebted to several persons for assistance in field work and in other respects. In particular, I am obliged to Dr. B. Biswas (Calcutta) for supplying data from the collections of the Zoological Survey of India, and to Dr. S. M. Mohnot (Jodhpur) for some weight data.

SUMMARY

1. Intraspecific variation in body size, proportion of body parts, and weight are examined in the numerous subspecies of *Presbytis entellus* (Dufresne) (Cercopithecidae, Colobinae) whose range of distribution in South Asia is also given.

2. On the basis of tail carriage, two main, evidently genetically determined, groups of subspecies can be recognised, viz., a Northern Group (with a forwardly curved tail) and a Southern Group (with a backwardly curved tail) (for details see Roonwal, 1979).

3. The overall size of the species ranges as follows (lengths in mm) : Head-and-Body 451-787 (average 636.1) ; tail 660-1,118 (av. 884.3) ; hind-foot 152-229 (av. 189.5) ; ear 35-51 (av. 43.9). The Himalayan subspecies, *ajax, schistaceous* and *achilles,* are the largest, while those of the extreme south are the smallest (and in the Peninsular subspecies a north-south genoclinal trend is noticeable). On the whole, the members of the Northern Group of subspecies are larger than the Southern.

4. The tail length is always longer (slightly to considerably, almost twice) than the head-and-body.

5. Within individual subspecies, the tail length increases directly with head-and-body length. But between the subspecies, different trends of increase are noticeable. Proportionate to head-and-body, the tail is shortest (c. 121% —136% of head-and-body) in the Himalayan subspecies (*ajax*, *schistaceous* and *achilles*) and the longest (c. 157%) in *entellus*.

6. The hind-foot is shortest in the northern subspecies, *ajax*, *schistaceous* and *achilles* (average 30% of head-and-body), and longest in *entellus* and *thersites* (c. 32%).

7. The overall adult weight of the species ranges as follows (in kg) :—Males 9.0—20.9 (average 15.3) ; females 5.9—18.0 (av. 11.3) ; both sexes 5.9—20.9 (av. 12.6). Members of the Northern Group of subspecies are heavier than the Southern (c. 35% heavier among males and 55% among females). The Himalayan subspecies, *ajax*, *schistaceous* and *achilles*, are the heaviest (av. 16.3—17.7 kg), and the southernmost species the lightest (av. 8.95—12.80 kg). Body weight is generally directly correlated with size (length of head-and-body).

8. Sexual dimorphism : This varies with the subspecies, the body parts and their proportions. In the length of head-and-body, females are generally smaller than males. The greatest differences are noticeable in the Himalayan subspecies, *ajax*, *schistaceous* and *achilles* (females are 10%—20% smaller) and again (though weaker) in the extreme southern subspecies, *thersites* ; in the other subspecies the two sexes are subequal. Dimorphism also occurs in the relative length of the tail (in respect of head-and-body), being most marked in the northern subspecies (*ajax* and *schistaceous*) and rather less in the southern (*aeneas*, *priam* and *thersites*), tails in females being 4%—13% longer than in males. Regarding body weight, females are generally lighter than males, the degree of difference varying with the subspecies.

9. The species *P. entellus* extends over a vast area of about 3,084, 800 km^2, though the distribution of actual populations is spotty. A single subspecies, *P. e. entellus* of the North Indian Plains, occupies as much as about 42% of the range, and is rather uniform in character over this large area. This feature has arisen evidently because of the absence of migration barriers and the resulting free gene-flow. Due apparently to the presence of mountain and forest barriers in the rest of the range, populations have become split up into large and small pockets, the genetic drift in varying population sizes then resulting in rapid and considerable subspeciation, as along the Himalayas (4 subspecies) and in Peninsular India and Sri Lanka (10 subspecies),

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Addendum

After this paper had gone to the press, Hrdy's (1977) work came to my attention. She gives more data on weights which require some modification of my conclusions, as follows :—

P. entellus entellus

For Jodhpur (Mandore Gardens), Mohnot's data (used by me) gave the adult weight of 8 females as 11.5-14.0 kg (average 13.2), while Hrdy gave lighter weights (kg) for females, as follows :—

Multiparous (8) : 10.0-13.6 (av. 11.7).
Nulliparous (4) : 6.8-10.0 (av. 8.6).
Both types (12) : 6.8-13.6 (av. 10.6).

For Mount Abu, Hrdy gave the adult weights (kg) as follows :

Males (3) : 17.7-18.7 (av. 18.3).

Females : Multiparous (10) : 10.1-12.3 (av. 11. 3).
Primiparous (3) : 8.2-10.5 (av. 9.0).
Nulliparous (5) : 6.4-9.5 (av. 7.9).
All types (18) : 6.4-12.3 (av. 9.98).

It is, therefore, not possible to say, as stated in the text above, that populations in Western India are somewhat heavier than those from the east.

HRDY, SARAH B. 1977. *The Langurs of Abu. Female and Male Strategies of Reproduction* xxiii+2+361 pp., col. figs. (4 pp.)—Cambridge (Mass.) and London (Harvard Univ. Press).

Table 1.—*Presbytis entellus.* **Adult size (length in mm) of some body-parts in various subspecies, arranged generally from north to south. (Figures in brackets are percentages of Head-and-Body.)**

Sources: **OM, Obouseier and Maydell 1960; P, Pocock 1928a; PP, Pocock 1939; R, Roberts 1977. Rl., Ryley 1913; Z, Roonwal (present account).**

Note: **Except where otherwise stated, all localities are from India; the abbreviations used for the States are: A. P., Andhra Pradesh; Bh., Bihar; Guj., Gujarat; H. P., Himachal Pradesh; Kn., Karanataka; Kr., Kerala; Mah., Maharashtra; M. P., Madhya Pradesh; Or., Orissa; Raj., Rajasthan; T. N., Tamil Nadu; U. P., Uttar Pradesh; W. B., West Bengal.**

Males							Females						
Sl. No.	Locality	Source	Length of Head-and-Body	Length of Tail	Length of Hind-foot	Length of Ear	Sl. No.	Locality	Source	Length of Head-and-Body	Length of Tail	Length of Hind-foot	Length of Ear
1	2	3	4	5	6	7	8	9	10	11	12	13	14
(A) NORTHERN GROUP OF SUBSPECIES													
1. *P. e. ajax*													
1	Hazara District (NW Pakistan)	R	762	864 (113%)	—	—	1	Hazara District (NW Pakistan)	R	635	788 (124%)	—	—
2	Deolah, 1829 m (Chamba, H. P.)	P	762	965 (127%)	229 (30%)	51 (7%)	2	Chicaian, 2743m (Kangra, H. P.)	P	686	724 (106%)	216 (31%)	38 (6%)
3	Bara Tissa, 2134m (Chamba, H. P.)	P	762	813 (107%)	203 (27%)	51 (7%)	3	Samyala, 2896m (Kangra, H. P.)	P	686	864 (126%)	178 (26%)	38 (6%)
4	Chalan Tissa, 1942m (Chamba, H. P.)	P	762	838 (110%)	229 (30%)	51 (7%)	4	Kangra, 732m (H. P.)	P	610	838 (137%)	191 (31%)	38 (6%)

Table 1. *continued.*

1	2	3	4	5	6	7	8	9	10	11	12	13	14
5	Kangra Fort 747 m (H. P.)	P	787	876 (111%)	216 (27%)	38 (5%)	5	Rahala, 2987m (Kulu, H. P.)	P	559	787 (123%)	178 (32%)	38 (7%)
							6	,, ,,	P	508	775 (133%)	178 (35%)	45 (9%)
							7	,, ,,	Z	530	770 (145%)	180 (34%)	40 (8%)
					2. *P. e. schistaceous* (syns. *hector* and *nipalensis*)								
1	Champawat, 1829m (Kumaon, U.P.) (*hector*)	P	698+	991 (141%−)	229+ (33%−)	51 (7%—)	1	Molta (H. P.) 3000 m (*hector*)	OM	680	810 (191%)	210 (31%)	40 (6%)
2	Sitabani, 610 m (Ramnagar, U. P.) (*hector*)	P	660	940 (142%)	216+ (33%+)	51 (8%)	2	,, ,,	OM	690	750 (109%)	200 (29%)	42 (6%)
3	Nepal Terai (Type of *schistaceous*)	P	762	914 (120%)	216 (28%)	—	3	Dela (Ramnagar, U.P.), 457 m (*hector*)	P	610+	851 (140%)	191 (30%)	38 (6%)
4	Nishangarh (Nepal Terai), 600 m	OM	760	980 (129%)	220 (29%)	50 (7%)	4	Nishangarh (Nepal Terai), 600 m	OM	690	940 (136%)	205 (30%)	40 (6%)
5	,, ,,	OM	720	960 (133%)	220 (31%)	50 (7%)	5	,, ,,	OM	660	700 (106%)	200 (30%)	40 (6%)
							6	,, ,,	OM	690	910 (132%)	190 (28%)	46 (7%)
							7	Hazaria, Pathergatti (Nepal Terai), 91 m	P	584	914 (157%)	191 (31%)	38 (7%)
					3. *P. e. achilles*								
1.	Satthar Hill, 3658m (Nepal) (Type)	P	762	927 (122%)	224 (29%)	45 (6%)	1	Sikkim	P	673	838 (125%)	203 (30%)	45 (7%)

Table 1. *continued.*

1	2	3	4	5	6	7	8	9	10	11	12	13	14
							2	Sikkim	P	635	711 (112%)	191 (30%)	45 (7%)
							3	,,	P	610	768 (126%)	203 (33%)	45 (7%)
						4. *P. e. lania*							
—	—	—	—	—	—	—	1	Chumbi, 3048 m (S. Tibet) (Type)	P	635	—	191 (30%)	45 (7%)
						5. *P. e. entellus*							
1	Junagarh (Guj.)	P	584	953 (163%)	197 (34%)	45 (8%)	1	Jodhpur (Raj.)	Z	630	956 (152%)	—	—
2	Hoshangabad (M. P.), 1006 m	P	635	1080 (170%)	216 (34%)	51 (8%)	2	Deesa (Palanpur, Guj.)	P	572	889 (155%)	184 (32%)	45 (8%)
3	Ouda (Balaghat, M. P.)	Rl.	628	1078 (172%)	—	—	3	Talala (Junagarh, Guj.)	Z	480	910 (190%)	184 (38%)	44 (9%)
4	Muki (Balaghat, M. P.)	OM	680	1040 (153%)	196 (29%)	46 (7%)	4	Muki (Balaghat, M. P.)	OM	784	1006 (128%)	200 (26%)	50 (6%)
5	,, ,,	OM	740	1050 (142%)	200 (27%)	46 (6%)	5	,, ,,	OM	780	1000 (129%)	200 (26%)	48 (6%)
6	,, ,,	OM	740	1001 (135%)	210 (28%)	50 (7%)	6	,, ,,	OM	640	1000 (156%)	160 (27%)	40 (6%)
7	Hazaribag, 305m (Bh.)	P	648	1080 (167%)	210 (32%)	51 (8%)	7	Ramkanali (Inanpur, Manbhum, Bh).	Z	675	1025 (152%)	186 (28%)	46 (7%)
8	Midnapur (W. B.)	P	635	1118 (176%)	216 (34%)	51 (8%)	8	Midnapur (W. B.)	P	581	965 (166%)	178 (31%)	38 (7%)
9	,, ,,	Z	615	995 (162%)	195 (32%)	45 (7%)	9	Madanpur (Nadia W. B.)	Z	620	930 (150%)	175 (28%)	45 (7%)
10	Chikalda, 112 m (Berar, Mah.)	P	597	1067 (179%)	216 (36%)	—	10	,, ,,	Z	700	1000 (143%)	200 (29%)	52 (7%)

Table 1. *continued.*

1	2	3	4	5	6	7	8	9	10	11	12	13	14
11	Tarasingi (Ganjam, Or.)	Z	640	990 (155%)	191 (30%)	47 (7%)	11	Seonbadoh, 549 m (Berar, Mah.)	P	584	953 (163%)	197 (34%)	45 (8%)
12	Kotagarh (Boudh Khondmal, Or.)	Z	690	850 (123%)	200 (29%)	35 (5%)							
13	Burkat (Sambalpur District, Or.)	Z	451	803 (178%)	174 (39%)	36 (8%)							

(B) SOUTHERN GROUP OF SUBSPECIES

6. *P. e. anchises*

—	—	—	—	—	—	—	1	Diguvametta (Kurnool Dist., A.P.)	PP	648	991 (153%)	—	—
							2	,, ,,	PP	584	965 (165%)	—	—

7. *P. e. achates*

1	Mandurli (N. Kanara, Kn.)	OM	630	810 (129%)	170 (27%)	35 (6%)	1	Mandurli (N. Kanara, Kn.)	OM	560	730 (130%)	160 (29%)	35 (6%)
2	Gund (N. Kanara, Kn.)	OM	620	805 (130%)	160 (26%)	40 (6%)	2	Anshi (N. Kanara, Kn.)	OM	520	790 (152%)	165 (32%)	40 (8%)
3	Dandeli (N. Kanara, Kn.)	Z	595	935 (157%)	195 (33%)	40 (7%)	3	Samasgi, 610 m (Kn.)	P	581	800 (138%)	165 (28%)	38 (7%)
4	Samasgi, 610m 610 m (Kn.)	P	610	864 (142%)	178 (29%)	38 (6%)	4	Haunsbari, 610m (Dharwar, Kn.)	P	622	838 (135%)	178 (29%)	45 (7%)
5	,, ,,	P	610	864 (142%)	178 (29%)	38 (6%)	5	Alvanar (Dharwar, Kn.)	P	660	876 (133%)	191 (29%)	51 (8%)

Table 1. *continued.*

1	2	3	4	5	6	7	8	9	10	11	12	13	14
6	Haunsbari, 610 m (Dharwar, Kn.) (Type)	P	686	1092 (159%)	203 (30%)	51 (7%)	6	Devikop, 610 m (Dharwar, Kn.)	P	635	953 (150%)	191 (31%)	51 (8%)
7	Devikop. 610 m (Dharwar, Kn.)	P	678	1003 (149%)	191 (28%)	51 (8%)	7	Vijayanagar, 457 m (Bellary, Kn.)	P	660	889 (135%)	191 (29%)	51 (8%)
8	,, ,,	P	660	965 (146%)	191 (29%)	51 (8%)							
9	Vijayanagar, 488 m (Bellary, Kn.)	P	673	1016 (151%)	216 (32%)	51 (8%)							
					8. *P. e. iulus*								
1	Jog (Gersoppa) Falls, 396 m (Shimoga, Kn) (Type)	P	521+	864 (166%−)	165 (32%)	45 (9%)	1	Jog (Gersoppa) Falls, 396 m (Shimoga, Kn.)	P	508+	914 (180%−)	172 (34%)	45 (9%)
							2	,, ,,	Z	555	725 (131%)	159 (29%)	38 (7%)
					9. *P. e. aeneas*								
1	Makut, 198 m (S. Coorg, Kn.) (Type)	P	711	940 (132%)	178 (25%)	38 (5%)	1	Wottekolli, 610 m (S. Coorg, Kn.)	P	635	914 (144%)	165 (26%)	38 (6%)
					10. *P. e. elissa*								
	—	—	—	—	—	—	1	Nagarhole (SE Coorg, Kn.)	P	635	927 (146%)	178 (28%)	38 (6%)
							2	,, ,,	P	622	800 (129%)	165 (27%)	38 (6%)

Table 1. *concluded.*

1	2	3	4	5	6	7	8	9	10	11	12	13	14
						11. *P. e. dussumieri*							
						No data							
						12. *P. e. priam* (syns. *pallipes* and *priamus*)							
1	Shevaroy Hills (T. N.)	PP	640	996 (156%)	213 (33%)	—	1	Palkonda Hills (A. P.)	PP	589	945 (160%)	182 (31%)	—
2	Dharmapuri Range (N. Salem, T. N.)	PP	640	949 (148%)	199 (31%)	—	2	Dharmapuri Range (N. Salem, T. N.)	Z	600	900 (150%)	173 (29%)	42 (7%)
3	Mahendragiri Range (S. Travancore, Kr.)	P	584	660 (113%)	191 (33%)	51 (9%)	3	,, ,,	PP	635	1016 (160%)	197 (31%)	—
						13. *P. e. priamellus*							
						No data							
						14. *P. e. hypoleucos*							
1	Travancore (Kr.)	P	559	813 (145%)	—	—	—	—	—	—	—	—	—
						15. *P. e. thersites*							
1	Cheddikulum (Sri Lanka)	P	635	914 (144%)	191 (31%)	51 (8%)	1	Cheddikulum (Sri Lanka)	Z	495	732 (148%)	170 (34%)	44 (9%)
2	,, ,,	P	603	813 (135%)	191 (32%)	51 (8%)	2	Mankeni (Sri Lanka)	P	508	883 (174%)	152 (30%)	38 (7%)
3	,, ,,	Z	550	785 (143%)	186 (34%)	44 (8%)	3	,, ,,	P	508	762 (150%)	165 (32%)	38 (7%)
4	Ranna (South Sri Lanka)	Prov., Z	525	865 (165%)	168 (32%)	39 (7%)	4	,, ,,	Z	525	724 (138%)	165 (31%)	40 (8%)

Table 2.—Summary of data on size (length in mm) of the external body-parts of subspecies of *Presbytis entellus* adults. (Subspecies generally arranged from north to south). R, range ; Av., average ; n, number of examples.

Sex	Head-and-Body (mm)	Tail (mm)	Hind-foot (mm)	Ear (mm)
	(A) NORTHERN GROUP OF SUBSPECIES			
	1. *P. e. ajax*			
♂	R. 762-787	813-965	203-229	38-51
	Av. 767.0	871.2	219.3	47.8
	n=5	=5	=4	=4
♀	R. 508-686	724-864	178-216	38-45
	Av. 602.0	792.3	186.8	37.2
	n=7	=7	=6	=6
Both	R. 508-787	724-965	178-229	38-51
	Av. 670.8	825.2	199.8	42.8
	n=12	=12	=10	=10
	2. *P. e. schistaceous* (syns. *hector* and *nipalensis*)			
♂	R. 660-762	914-991	216-229	50-51
	Av. 720.0	957.0	220.5	50.5
	n=5	=5	=5	=4
♀	R. 584-690	700-940	190-210	38-46
	Av. 657.7	837.9	198.1	40.6
	n=7	=7	=7	=7
Both	R. 584-762	750-991	190-229	38-51
	Av. 688.8	897.5	209.3	45.5
	n=12	=12	=12	=11
	3. *P. e. achilles*			
♂	R. 762	927	224	45
	Av. 762.0	927.0	224.0	45.0
	n=1	=1	=1	=1
♀	R. 610-673	711-838	191-203	45
	Av. 639.3	772.3	199.0	45.0
	n= 3	=3	=3	=3
Both	R. 610-762	711-927	191-224	45
	Av. 670.0	811.0	205.3	45.0
	n= 4	=4	=4	=4
	4. *P. e. lania*			
♂	—	No data	—	—
♀	R. 635	—	191	45
	Av. 635.0	—	191.0	45.0
	n= 1	=0	=1	=1

...*contd.*

Table 2. *Continued.*

Sex	Head-and-body (mm)	Tail (mm)	Hind-foot (mm)	Ear (mm)
		5. *P. e. entellus*		
♂	R. 451-740	803-1118	174-216	35-51
	Av. 637.2	1008.1	201.8	45.7
	n= 13	=13	=12	=11
♀	R. 480-784	889-1025	160-200	38-52
	Av. 640.5	966.7	186.4	45.3
	n= 11	=11	=10	=10
Both	R. 451-784	803-1118	160-216	35-52
	Av. 638.9	987.4	194.1	45.5
	n= 24	=24	=22	=21
	(B) SOUTHERN GROUP OF SUBSPECIES			
		6. *P. e. anchises*		
♂	—	No data	—	—
♀	R. 584-648	965-991	—	—
	Av. 616.0	978.0	—	—
	n= 2	=2	=0	=0
		7. *P. e. achates*		
♂	R. 595-686	864-1092	160-216	35-51
	Av. 639.7	928.2	186.9	43.9
	n= 9	=9	=9	=9
♀	R. 520-660	730-953	160-191	38-51
	Av. 605.4	839.4	177.3	44.4
	n= 7	=7	=7	=7
Both	R. 520-686	730-1092	160-216	35-51
	Av. 622.6	883.8	182.1	44.2
	n= 16	=16	=16	=16
		8. *P. e. iulus*		
♂	R. 521(+)	864	165	45
	Av. 521.0(+)	864.0	165.0	45.0
	n= 1	=1	=1	=1
♀	R. 508(+)-555	725-914	159-172	38-45
	Av. 531.5(+)	819.5	165.5	41.5
	n= 2	=2	=2	=2
Both	R. 508(+)-555	725-914	159-172	38-45
	Av. 528.0	834.3	165.3	42.7
	n= 3	=3	=3	=3
		9. *P. e. aeneas*		
♂	R. 711	940	178	38
	Av. 711.0	940.0	178.0	38.0
	n= 1	=1	=1	=1

...*contd.*

Table 2. *Concluded.*

Sex		Head-and-body (mm)	Tail (mm)	Hind-foot (mm)	Ear (mm)
♀	R.	635	914	165	38
	Av.	635.0	914.0	165.0	38.0
	n =	1	=1	=1	=1
Both	R.	635-711	914-940	165-178	38
	Av.	673.0	927.0	171.5	38.0
	n =	2	=2	=2	=2
			10. *P. e. elissa*		
♂	—		No data	—	—
♀	R.	622-635	800-927	165-178	38
	Av.	628.5	863.5	171.5	38.0
	n =	2	=2	=2	=2
			11. *P. e. dussumieri*		
			No data		
			12. *P. e. priam* (syns. *pallipes* and *priamus*)		
♂	R.	584-640	660-996	191-213	51
	Av.	621.3	868.3	201.0	51.0
	n =	3	=3	=3	=1
♀	R.	589-635	900-1016	173-197	42
	Av.	600.0	953.7	184.0	42.0
	n =	3	=3	=3	=1
Both	R.	584-640	660-1016	173-213	42-51
	Av.	610.7	911.0	192.5	46.5
	n =	6	=6	=6	=2
			13. *P. e. priamellus*		
			No data		
			14. *P. e. hypoleucos*		
♂	R.	559	813	—	—
	Av.	559.0	813.0	—	—
	n =	1	=1	=0	=0
♀	—		No data	—	—
			15. *P. e. thersites*		
♂	R.	525-635	785-914	168-191	39-51
	Av.	578.3	844.3	184.0	46.3
	n =	4	=4	=4	=4
♀	R.	495-525	724-883	152-170	38-44
	Av.	509.0	775.3	163.0	40.0
	n =	4	=4	=4	=4
Both	R.	495-635	724-914	152-191	38-51
	Av.	543.6	809.8	173.5	43.1
	n =	8	=8	=8	=8

Table 3.—*Presbytis entellus.* Range and averages of size (length in mm) of body parts in the Northern and Southern Groups of subspecies.

Item	Head-and-Body			Tail			Hind-foot			Ear		
	♂	♀	Both	♂	♀	Both	♂	♀	Both	♂	♀	Both
(A) NORTHERN GROUP OF SUBSPECIES												
Range	451-787	480-784	451-787	803-1118	711-1025	711-1118	174-229	160-216	160-229	35-51	38-52	35-52
Average	721.5	635.0	675.6	940.8	842.6	891.6	216.4	192.3	203.0	47.2	43.3	45.1
(B) SOUTHERN GROUP OF SUBSPECIES												
Range	521+(525)-711	495-660	495-711	660-1092	724-1016	660-1092	160-216	152-191	152-216	38-51	38-51	38-51
Average	605.1	589.3	596.5	876.3	877.6	877.0	183.0	171.1	176.5	44.8	40.7	42.6
(C) OVERALL, FOR THE SPECIES												
Range	451-787	480-784	451-787	660-1118	711-1025	660-1118	160-229	152-216	152-229	36-51	38-51	35-51
Average	663.3	612.2	636.1	908.6	860.1	884.3	199.7	181.7	189.5	46.0	42.0	43.9

Table 4.—*Presbytis entellus*. Sexual dimorphism in size of body-parts (average lengths, in mm, cf. Table 5) in some subspecies (arranged generally north to south).
Av.= average.

Subspecies of *Presbytis entellus*	Head-and-Body			Tail			Hind-foot			Ear		
	Av. ♂ mm	Av. ♀ mm	♀ as % of ♂	Av. ♂ mm	Av. ♀ mm	♀ as % of ♂	Av. ♂ mm	Av. ♀ mm	♀ as % of ♂	Av. ♂ mm	Av. ♀ mm	♀ as % of ♂
(A) NORTHERN GROUP OF SUBSPECIES												
1. *ajax*	767.0	602.0	79%	871.2	792.3	91%	219.3	186.8	85%	47.8	37.2	78%
2. *schistaceous* (syns. *hector* and *nipalensis*)	720.0	657.7	91%	957.0	837.9	88%	220.5	198.1	90%	50.5	40.6	81%
3. *achilles*	762.0	639.3	84%	927.0	772.3	83%	224.0	199.0	89%	45.0	45.0	100%
4. *entellus*	637.2	640.5	101%	1008.1	966.7	96%	201.8	186.4	92%	45.7	45.3	99.1%
(B) SOUTHERN GROUP OF SUBSPECIES												
5. *achates* ...	639.7	605.4	95%	928.2	839.4	90%	186.9	177.3	94%	43.9	44.4	101%
6. *iulus*	521.0(+)	531.5(+)	102%	864.0	819.5	95%	165.0	165.5	c.100(+)%	45.0	41.5	92%
7. *aeneas*	711.0	635.5	89%	940.0	914.0	97%	178.0	165.0	93%	38.0	38.0	100%
8. *priam* (syns. *pallipes* and *priamus*) ...	621.3	600.0	97%	868.3	953.7	110%	201.0	184.0	91%	51.0	42.0	82%
9. *thersites* ...	578.3	509.0	88%	844.3	775.3	92%	184.0	163.0	89%	46.3	40.0	86%

Table 5.—*Presbytis entellus.* Size (length) proportions of some external body-parts as percentage of length of Head-and-Body in adults of various subspecies (generally arranged from north to south). R. = range ; Av. = average ; n = number of examples.

Subspecies of *Presbytis entellus*		Length of Tail as% of Length of Head-and-Body			Length of Hind-foot as% of Length of Head-and-Body			Length of Ear as% of Length of Head-and-Body		
		♂	♀	Both	♂	♀	Both	♂	♀	Both
(A) NORTHERN GROUP OF SUBSPECIES										
1. *ajax*	R.	107-127	106-145	106-145	27-30	26-35	26-35	5-7	6-9	5-9
	Av.	113.6	127.7	122.6	28.5	31.5	30.3	6.5	7.0	6.8
	n	=5	=7	=12	=4	=6	=10	=4	=6	=10
2. *schistaceous* (syns. *hector* and *nipalensis*)	R.	120-142	106-157	106-157	28-33	28-31	28-33	7-8	6-7	6-8
	Av.	133.0	138.7	136.3	30.8	29.9	30.3	7.3	6.3	6.6
	n	=5	=7	=12	=5	=7	=12	=4	=7	=11
3. *achilles*	R.	122	112-126	112-126	29	30-33	29-33	6	7	6-7
	Av.	122.0	121.0	121.3	29.0	31.0	30.5	6.0	7.0	6.8
	n	=1	=3	=4	=1	=3	=4	=1	=3	=4
4. *lania*	R.	—	—	—	—	30	30	—	7	7
	Av.	—	—	—	—	30.0	30.0	—	7.0	7.0
	n	=0	=0	=0	=0	=1	=1 (♀)	=0	=1	=1 (♀)
5. *entellus*	R.	123-179	128-190	123-190	27-39	26-38	27-39	5-8	6-9	5-9
	Av.	159.6	153.1	156.6	32.0	29.9	31.1	7.2	7.1	7.1
	n	=13	=11	=24	=12	=10	=22	=11	=10	=21

Table 5. *continued.*

Subspecies of *Presbytis entellus*		♂	♀	Both	♂	♀	Both	♂	♀	Both
(B) SOUTHERN GROUP OF SUBSPECIES										
6. *anchises*	R.	—	153-165	153-165	—	—	—	—	—	—
	Av.	—	159.0	159.0	—	—	—	—	—	—
	n	=0	=2	=2 (♀)	=0	=0	=0	=0	=0	=0
7. *achates*	R.	129-159	130-152	129-159	26-33	28-32	26-33	6-8	6-8	6-8
	Av.	145.0	139.0	142.4	29.2	29.4	29.4	6.9	7.4	7.1
	n	=9	=7	=16	=9	=7	=16	=9	=7	=16
8. *iulus*	R.	166	131-181(-)	131-181(-)	32	29-34	29-34	9	7-9	7-9
	Av.	166.0	155.5 (-)	159.0 (-)	32.0	31.5	31.7	9.0	8.0	8.3
	n	=1	=2	=3	=1	=2	=3	=1	=2	=3
9. *aeneas*	R.	132	144	132-144	25	26	25-26	5	6	5-6
	Av.	132.0	144.0	138.0	25.0	26.0	25.5	5.0	6.0	5.5
	n	=1	=1	=2	=1	=1	=2	=1	=1	=2
10. *elissa*	R.	—	129-146	129-146	—	27-28	27-28	—	6	6
	Av.	—	137.5	137.5	—	27.5	27.5	—	6.0	6.0
	n	=0	=2	=2 (♀)	=0	=2	=2 (♀)	=0	=2	=2 (♀)
11. *dussumieri*		—	—	—	No data		—	—	—	—
12. *priam* (syns. *pallipes* and *priamus*)	R.	113-156	150-160	113-160	31-33	29-31	29-33	9	7	7-9
	Av.	139.0	156.7	147.8	32.3	30.3	31.3	9.0	7.0	8.0
	n	=3	=3	=6	=3	=3	=6	=1	=1	=2
13. *priamellus*		—	—	—	No data		—	—	—	—

...*contd.*

Table 5. *concluded.*

Subspecies of *Presbytis eniellus*		♂	♀	Both	♂	♀	Both	♂	♀	Both
14. *hypoleucos*	R.	145	—	145	—	—	—	—	—	—
	Av.	145.0	—	145.0	—	—	—	—	—	—
	n	=1	=0	=1 (♂)	=0	=0	=0	=0	=0	=0
15. *thersites*	R.	135-165	138-174	135-174	31-34	30-34	30-34	7-8	7-9	7-9
	Av.	146.8	152.5	149.7	32.3	31.8	32.0	7.8	7.8	7.8
	n	=4	=4	=8	=4	=4	=8	=4	=4	=8
Overall range for the species		107-179	106-190	106-190	21-39	26-35	21-39	5-9	6-9	5-9
Range of averages for subspecies		113.6-166.0	121.0-159.0	121.3-159.0	25.0-32.3	26.0-31.8	25.5-32.2	5.0-9.0	6.0-8.0	5.5-8.3
Overall average for the species		140.2	144.0	143.9	30.0	29.9	29.95	7.2	7.0	7.1

Table 6.—*Presbytis entellus.* Range and averages of the proportions (percentages) in the length of some body parts (in terms of the length of head-and-body) in the Northern and Southern Groups of subspecies.

Item	Tail (%)			Hind-foot (%)			Ear (%)		
	♂	♀	Both	♂	♀	Both	♂	♀	Both
(A) NORTHERN GROUP OF SUBSPECIES									
Range	107-179	106-190	106-190	21-39	26-38	21-39	5-8	6-9	5-9
Average	132.1	135.1	133.6	29.9	30.5	30.2	6.4	7.1	6.8
(B) SOUTHERN GROUP OF SUBSPECIES									
Range	113-166	129-181	113-181	25-34	26-34	25-34	5-9	6-9	5-9
Average	145.6	149.2	147.5	30.2	29.4	29.8	7.5	7.0	7.3
(C) OVERALL, FOR THE SPECIES									
Range	107-179	106-190	106-190	21-39	26-35	21-39	5-9	6-9	5-9
Average	140.2	144.0	143.9	30.0	29.9	29.95	7.2	7.0	7.1

Table 7.—*Presbytis entellus.* Sexual dimorphism in proportions of body-part lengths, as percentage of length of head-and-body (H. & B.), in some subspecies (arranged generally north to south).

Av. = Average

Subspecies of *Presbytis entellus*	Tail (as% of H. & B.)			Hind-foot (as%of H. & B.)			Ear (as % of H. & B.)		
	Av. ♂	Av. ♀	♀ as% of ♂	Av. ♂	Av. ♀	♀ as % of ♂	Av. ♂	Av. ♀	♀ as % of ♂
(A) NORTHERN GROUP OF SUBSPECIES									
1. *ajax*	113.6	127.7	112	28.5	31.5	111	6.5	7.0	108
2. *schistaceous* (syns. *hector* and *nipalensis*)	133.0	138.7	104	30.8	29.9	97	7.3	6.3	86
3. *achilles*	122.0	121.0	99	29.0	31.0	107	6.0	7.0	117
4. *entellus*	159.6	153.1	96	31.1	29.9	96	7.2	7.1	99
(B) SOUTHERN GROUP OF SUBSPECIES									
5. *achates*	145.0	139.0	96	29.2	29.4	101	6.9	7.4	107
6. *iulus*	166.0	155.5(-)	94(−)	32.0	31.5	98	9.0	8.0	89
7. *aeneas*	132.0	144.0	109	25.0	26.0	104	5.0	6.0	120
8. *priam* (syns. *pallipes* and *priamus*)	139.0	156.7	113	32.3	30.3	94	9.0	7.0	78
9. *thersites*	146.8	152.5	104	32.3	31.8	98	7.8	7.8	100

Table 8.—Adult weights of various subspecies of *Presbytis entellus* (arranged generally from north to south). (Except where otherwise indicated, all localities are from India.) Also see Addendum, p. 138.

Abbreviations: av., average; A. P., Andhra Pradesh; H. P., Himachal Pradesh; Karn., Karnataka; M. P., Madhya Pradesh; N. P., Northern Province; Raj,, Rajasthan; T. N., Tamil Nadu; U. P., Uttar Pradesh; W. B., West Bengal; ZSI coll., Zoological Survey of India collection, Calcutta.

Males			Females		
Locality	Weight (kg)	Source	Locality	Weight (kg)	Source
(A) NORTHERN GROUP OF SUBSPECIES					
1. *P. e. ajax*					
1. Bara Tissa, 2134 m (Chamba, H. P.)	19.5	Pocock (1928a)	1. Chicaian, 2743 m (Kangra, H. P.)	12.7	Pocock (1928a)
2. Kangra (H. P.)	20.9,	Pocock (1939)			
2. *P. e. schistaceous* (synonyms ***hector*** and ***nipalensis***)					
1. Sitabani, 610 m. (Ramnagar, U. P.)	17.2	Pocock (1928a)	1. Molta, 3000 m (H. P.)	18.0	Oboussiar & Maydell (1960)
			2. ,, ,,	18.0	,,
2. Nishangarh, 600 m (Nepal Terai)	18.0	Oboussier & Maydell (1960)	3. Dela, 457 m (Ramgarh, U. P.)	17.7	Pocock (1928a)
3. ,, ,,	18.0	,,	4. Ratighat, 1127 m (NainiTal, U. P.)	14.1	,,
			5. Nishangarh, 600 m (Nepal Terai)	15.0	Oboussier & Maydell (1960)
			6. ,, ,,	14.0	,,
			7. ,, ,,	14.0	,,
3. *P. e. achilles*					
1. Melmechi Delta, 2439-3050 m (east-central Nepal)	19.5	Bishop (1975)	1. Melmechi Delta, 2439-3050 m (east-central Nepal)	15.4	Bishop (1975)
2. ,, ,,	14.5	,,	2. ,, ,,	16.8	,,
3. Lachen, Sikkim	15.9	Pocock (1939)	3. Sikkim	15.8	Pocock (1928a)
4. *P. e. entellus*					
1. Mt. Abu (Raj.)	Av. 18.2 (n=4)	Bishop (1975, Hrdy's data)	1. Mandore (near Jodhpur, Raj.)	13.0	Mohnot (pers. comm.)

Table 8. *Continued*

Males			Females		
Locality	Weight (kg)	Source	Locality	Weight (kg)	Source
2. Midnapur (W. B.)	15.9	Pocock (1928a)	Mandore (near 2. Jodhpur, Raj.)	11.5	Mohnot (pers comm.)
3. Muki (Balaghat, M. P.)	9.2	Oboussier & Maydell (1960)	3. „ „	14.0	„
			4. „ „	12.0	„
4. „ „	9.6	„	5. „ „	13.0	„
5. „ „	9.4	„	6. „ „	14.0	„
			7. „ „	13.5	„
			8. „ „	14.0	„
			9. Mt. Abu (Raj.)	Av. 11.2 (n=12)	Bishop (1975, Hady's data)
			10. Midnapur (W. B.)	11.3	Pocock (1928a)
			11. Muki (Balaghat, M. P.)	10.0	Oboussier & Maydell (1960)
			12. „ „	10.5	„
(B) SOUTHERN GROUP OF SUBSPECIES					
5. *P. e. anchises*					
1. "Southern Langur" (exact location not given ; probably M. P. or A. P.)	15.9 (heaviest)	Shortridge (1914)	1. "Southern Langur" (exact location not given ; probably M. P. or A. P.)	12.2 (heaviest)	Shortridge (1914)
(Shortridge, 1914, gives "averages" as 6.8-13.6 kg. Mc Cann, 1928, evidently repeats Shortridge's data.)					
			2. Diguvametta (Kurnool Dist., A. P.)	10.9 (old ♀)	Pocock (1939)
			3. „ „	10.4	„
6. *P. e. achates*					
1. Mandurli (N. Kanara, Karn.)	9.0	Oboussier & Maydell (1960)	1. Anshi (N. Kanara, Karn.)	7.5	Oboussier & Maydell (1960)
2. Gund (N. Kanara, Karn.)	10.0	„	2. Mandurli (N. Kanara, Karn.)	6.5	„
3. Samasgi, 610 m (SW of Dharwar, Karn.)	10.3	Pocock (1928a)	3. Samasgi, 610 m (Sw of Dharwar, Karn.)	7.7	Pocock (1928a)

...*contd.*

Table 8. *Concluded*

Males			Females		
Locality	Weight (kg)	Source	Locality	Weight (kg)	Source
4. Samasgi, 610 m (Sw of Dharwar, Karn.)	8.7	Pocock (1928a)	4. Haunsbhavi, 610 m (S of Dharwar, Karn.)	10.2	Pocock (1928a)
5. Haunsbhavi, 610 m (S of Dharwar, Karn.)	13.6	„	5. Vijayanagar, 457 m (Bellary, Karn.)	12.2	„
6. Vijayanagar, 488 m (Bellary, Karn.)	15.9	„			
7. *P. e. iulus*					
1. Jog, Gersoppa Falls, 396 m (Karn.)	9.5	Pocock (1928a)	1. Jog, Gersoppa Falls, 396 m (Karn.)	8.4	Pocock (1928a)
8. *P. e. aeneas*					
1. Makut, 76 m (S. Coorg, Karn.)	11.6	Pocock (1928a)	1. Wottekolli, 610 m (S. Coorg, Karn.)	10.0	Pocock (1928a)
9. *P. e. elissa*					
—	No data	—	1. Nagerhole (SE Coorg, Karn.)	10.4	Pocock (1928a)
			2. „ „	8.3	„
10. *P. e. priam* (synonyms *pallipes* and *priamus*)					
1. Shevaroy Hills (T. N.)	16.8	Pocock (1928a)	1. Palkonda Hills (A. P.)	8.8	Pocock (1939)
11. *P. e. thersites*					
1. Cheddikulum (N. P., Sri Lanka)	13.3	Pocock (1928a)	1. Mankeni (Sri Lanka)	6.8	Pocock (1928a)
2. „ „	11.4	„	2. „ „	5.9	„
3. „ „	9.2	ZSI Coll.	3. Sri Lanka	8.6 (heaviest ; av. of 6, 7.0	Phillips (1935)
4. Sri Lanka	13.4 (heaviest ; av. of 6, 12.5)	Phillips (1935)			

Table 9.—*Presbytis entellus.* Summary of data on adult weight and sexual dimorphism in various subspecies (no data are available for 4 subspecies); generally arranged north to south. Also see Addendum, p. 138.

R., range ; Av., average ; n, number of examples

Subspecies of *Presbytis entellus*		Males (Kg)	Females (Kg)	Both sexes (Kg)	Sexual Dimorphism (♀ as% of ♂)
(A) NORTHERN GROUP OF SUBSPECIES					
1. *ajax*	R.	19.5—20.9	12.7	12.7—20.9	
	Av.	20.2	12.7	17.7	63%
	n	=2	=1	=3	
2. *schistaceous* (syns. *hector* and *nipalensis*	R.	17.2—18.0	14.0—18.0	14.0—18.0	
	Av.	17.7	15.8	16.4	89%
	n	=3	=7	=10	
3. *achilles*	R.	14.5—19.5	15.4—16.8	14.5—16.8	
	Av.	16.6	16.0	16.3	98%
	n	=3	=3	=6	
4. *entellus*	R.	9.2—18.2 (+)	10.0—14.0	9.2—18.2 (+)	
	Av.	14.9	11.8	12.5	79%
	n.	=8	=23	=31	
(B) SOUTHERN GROUP OF SUBSPECIES					
5. *anchises*	R.	15.9 (heaviest)	10.4 (6.8?)—12.2	10.4 (6.8?)—15.9	
	Av.	15.9	11.2	12.4	70%
	n	=1	=3	=4 (+)	
(Shortridge, 1914, gives the "averages" as 6.8-13.6)					
6. *achates*	R.	9.0—15.9	6.5—12.2	6.5—15.9	
	Av.	11.3	8.8	10.1	78%
	n	=6	=5	=11	
7. *iulus*	R.	9.5	8.4	8.4—9.5	
	Av.	9.5	8.4	8.95	88%
	n	=1	=1	=2	
8. *aeneas*	R.	11.6	10.0	10.0-11.6	
	Av.	11.6	10.0	10.8	86%
	n	=1	=1	=2	
9. *elissa*	R.	—	8.3-10.4	—	
	Av.	—	9.4	—	—
	n	=0	=2	—	
10. *priam* (syns. *pallipes* and *priamus*)	R.	16.8	8.8	8.8—16.8	
	Av.	16.8	8.8	12.8	55%
	n	=1	=1	=2	
11. *thersites*	R.	9.2—13.6	5.9—8.6	5.9—13.6	
	Av.	12.1	6.8	9.6	56%
	n	=9	=8	=17	

Table 10.—*Presbytis entellus.* Range and averages for adult weights in the Northern and Southern Groups of subspecies.

Item	Males (kg)	Femals (kg)	Both sexes (kg)
(A) NORTHERN GROUP OF SUSPECIES			
Range	9.2—20.9	10.0—18.0	9.2—20.9
Average	16.3	13.0	14.1
(% of Southern Group)	(135%)	(155%)	(138%)
(B) SOUTHERN GROUP OF SUBSPECIES			
Range	9.0 16.8	5.9—12.2	5.9—16.8
Average	12.1	8.4	10.2
(C) OVERALL, FOR THE SPECIES			
Range	9.0—20.9	5.9—18.0	5.9—20.9
Average	15.3	11.3	12.6