XI.—*Description of* Golunda Ellioti *from Sind.*

By W. T. Blanford, *F. R. S.*

(Recd. June 28th;—Read August 2nd, 1876).

(With Plate X.)

Amongst a few mammals and reptiles in spirit, collected and given to me by Mr. H. E. Watson of the Sind Commission, are two specimens, one adult, the other young, of a mouse or small rat with very coarse, flat, grooved hairs and the upper incisors sulcated. These mice were obtained on the southern extremity of the Khirthar, a range of mountains which forms the western boundary of Upper Sind, but which enters the province nearly west of Sehwán, and running thence south-south-east, terminates about 40 miles south of Sehwán and rather more than 50 north-west of Kotri. At their southern extremity these hills are 2300 feet high, to the north they are from 4000 to 6000, some peaks being even higher.

The skull of the larger specimen, on being extracted, proves to be of the ordinary murine type, and the only peculiarity is in the characters of the teeth. The upper incisors are grooved, and the molars, instead of being simply tuberculate, as in *Mus*, appear to be formed of deep folds of enamel, as in *Gerbillus* or *Nesokia*, but the form of the folds is widely different from what it is in those genera; each fold consisting of a number of deep lobes or pillars with a nearly semicircular section. Thus the upper surface of the crown of the tooth has a most peculiar reticulated appearance. The semicircular lobes are arranged throughout the teeth in three longitudinal series in the upper, and two in the lower jaw. In older specimens the lobes may run more into each other, but the skull examined is fully adult.

No description or figure, so far as I am aware, of the teeth of any Indian mouse has ever been published exhibiting the peculiarities above described. The published descriptions of the molar teeth in *Leggada* and *Golunda* appear to me to differ materially from those of the specimen from Sind. The incisors in *Leggada* are nowhere said to be grooved, and no mention is made in any of the descriptions of *Golunda* by Gray,* Elliot,† or Jerdon,‡ of flattened or grooved hairs. I unfortunately did not at first examine the specimens of *Golunda Ellioti* in the Indian Museum sufficiently carefully, as the description both of the fur and dentition appeared to me to refer to

* Charlesworth's Mag. Nat. Hist. I, 1837, p. 586.

† Mad. Jour. Lit. and Science, X, 1839, p. 213.

‡ Mammals of India, p. 212.

a very different form. The only murine genus of which I could find a description with dentition resembling that in the Sind species was *Pelomys** of Peters, founded on an African rat from Mozambique. I concluded that the Sind rat was a new species of *Pelomys*, and I proposed to call it *P. Watsoni*. This name was unfortunately published in the Proceedings of the Society for August before I had discovered my mistake.

For this discovery I am indebted to Professor Peters, to whom I sent a sketch of the molars of the Sind rat, which I asked him to compare with those of *Pelomys*. This he did and told me that they agreed. He also called my attention to the circumstance that the coffee-rat of Ceylon, of which he had received a specimen, closely resembled *Pelomys* in its dentition and even in its external characters, and he suggested that the genera *Golunda* and *Pelomys* were identical. Upon this I re-examined the specimens marked *Golunda Ellioti* in the Museum, and to my surprise found that they coincided with mine from Sind; and the skull of one specimen which Dr. Anderson very obligingly allowed to be extracted for me proved identical with that of the Sind rat. I, however, noticed that in these specimens, perhaps because they have been exposed for years, the grooved hairs have split at the ends, and present the appearance of ordinary round or nearly round hairs, so that it is necessary to examine the fur closely in order to detect its peculiarity. I also find that the Sind rat agrees excellently in characters and dimensions with Kelaart's original description,† and that Mr. Blyth‡ has already called attention to the differences between the coffee-rat of Ceylon and the description of the *Gulandi* (*Mus hirsutus*, Elliot, said to be identical with *Golunda Ellioti*, Gray) given by Mr. (now Sir Walter) Elliot.§ I ought not to have overlooked these facts, but I must say in apology that I do not think any one could have identified the Sind rat from the published descriptions of *Golunda Ellioti*.

Before discussing the synonymy of this rat, I will give a description of the Sind specimen.

Description taken from an adult female specimen preserved in spirit. General colour brown above, the colour not being uniform but a mixture of black and fulvous, dirty white (isabelline) below. The hairs are very flat with a broad groove down one side. The fur is harsh, dusky grey at the base, then darker, tawny towards the extremities on the back, pale tawny on the abdomen; numerous longer hairs, either blackish throughout, or

* Reise nach Mossambique, Säugethiere, p. 157, Pl. XXXIII, Fig. 3, XXXV, Fig. 9.

† Prodromus Faunæ Zeylanicæ, p. 67.

‡ J. A. S. B., 1863, p. 351, and Catalogue Mam. Mus. As. Soc. p. 121, foot-note.

§ Mad. Jour. Lit. Sci. l. c.

with a pale tip, being scattered over the back, and producing the brown colour, which resembles that of a hare *(Lepus europæus* v. *L. ruficaudatus)*. The average length of the hairs in the middle of the back is rather less than half an inch; the longer hairs measure 0·6 to 0·7 of an inch. The whiskers are black near the base, brown towards the ends, the longest being about the same length as the head. Muzzle thickly clad with short hair.

The ears are rounded, nearly naked, having only very short scattered hairs outside, but thinly clad with brown hair inside. The feet are pale brown above, the soles naked. The tubercles on the soles are well developed; on the fore-foot there are five, three arranged in a triangle at the base of the three middle toes, and two rather larger, close together, and nearly parallel, behind. The rudimentary hallux is behind the former tubercles and in front of the latter; it is furnished with a small flat nail; the other claws are compressed. In the hind-feet all five toes are furnished with compressed claws, much longer than those on the fore-toes. The second, third, and fourth hind-toes are nearly equal in length, the middle toe being scarcely longer than the others, and the fourth a little shorter than the second; the first and fifth toes also are subequal, the first being 7 mm. (0·27 inch) shorter than the second. The tubercles on the sole are in three pairs, each pair being nearly parallel, and the middle pair rather farther apart than the other two. The claws are pale horny in colour. The tail is stout at the base and tapers gradually to a fine point; it is rather shorter than the head and body, finely ringed, and thinly clad with short bristly hairs, which are black above, tawny on the sides and below. There are 2 pectoral and 2 inguinal pairs of mammæ.

The skull is typically murine, the deep fissure running downwards from the large infraorbital foramen being open as in ordinary rats; there is a well marked crest which runs along the edge of the frontal bones above the orbit, and is continued back over the parietal bones. The interparietal is convex behind and nearly straight in front; it is about half the breadth of the skull. The zygomatic arch is strong. The anterior palatine foramina *(foramina incisiva)* are very long and extend fully two-thirds the distance from the incisors to the molars, but their hinder termination is in front of the molar teeth. The incisors in both jaws are deep orange externally; those of the upper jaw are flat in front and have a rather deep longitudinal groove near the external edge; those of the lower jaw are flattened in front and smooth. The upper molars are broad with low crowns; the bony palate narrow. The surface of the upper molars consists of nearly semicircular lobes arranged in three longitudinal series, each lobe having its convex margin directed forwards. The anterior upper molar contains 7 lobes, three in the middle which are rather longer than the others, two inside which are rather less, and two outside which are the smallest of all. The two outer

lobes are parallel to the inner pair, but intermediate in position to those of the middle row. The second upper molar consists of 6 lobes, one of which, however, which is external and anterior, is very minute; of the other five two belong to the middle row, two to the inner, one to the outer, the posterior middle lobe having a spur on the outer side; the hinder upper molar has but 4 lobes, two belonging to the middle, and two to the inner row; the hindmost lobe belonging to the middle row is very small. The lower molars are nearly uniform in breadth, the first being a little narrower in front and consisting of seven lobes, 3 on each side, and a minute additional lobe in the middle behind; the second contains 5 lobes, two on each side, and a minute supplementary lobe in the middle behind; the last molar contains 4 lobes, two internal, one external, and a minute additional lobe in the middle at the back of the tooth; all these lobes in the lower molars, except the small supplementary talons and the hinder inner lobe of the last molar, are arranged in pairs, and the inner lobes are a little larger than the outer.

The following are dimensions in inches and parts of a metre, taken from the specimen preserved in spirit and from the skull extracted from it.

	inches.	metre.
Total length from nose to end of tail, ...	8·65	·219
Length from nose to anus, ...	4·55	·116
„ of tail, ...	4·1	·105
„ of ear from orifice, ...	0·57	·014
Breadth of ear, ...	0·57	·014
Length of fore-foot (not including claws), ...	0·42	·011
„ of hind-foot (ditto), ...	0·9	·0225
„ of longest whisker, ...	1·3	·032
„ of skull from occipital plane to end of nasal bones, ...	1·22	·0305
Greatest breadth of skull across hinder part of zygomatic arches, ...	0·62	·015
Length of suture between nasal bones, ...	0·42	·0105
Breadth of frontal bones between orbits, ...	0·19	·005
Length of anterior palatine foramina, ...	0·22	·0055
„ of row of upper molars, ...	0·26	·0065
Breadth of bony palate between anterior upper molars, ...	0·05	·0015
Length of lower jaw from angle to symphysial extremity (incisors excluded), ...	0·68	·017
Height of do. to coronoid process, ...	0·42	·0105
Length of row of lower molars, ...	0·23	·006

I have already mentioned that this rat is identical with specimens in the Indian Museum, Calcutta. The two skins which I have compared are

from the Asiatic Society's collection, and one of them is *Golunda Ellioti* No. 297 D. of Mr. Blyth's Catalogue from Southern India, presented by Mr. Elliot. The other, of which the label has been lost, is doubtless No. 297 E from Ceylon. These specimens, as already stated, agree very well with Kelaart's description of his *Golunda Ellioti (Mus coffæus)*,* but, as was remarked by Mr. Blyth, they do not agree with *Mus hirsutus*, Elliot,† although the specimens from Southern India appear to have been sent as representing that species, or at least *Golunda Ellioti*, with which *Mus hirsutus* was identified by Dr. Gray.

Mus hirsutus, the *Gulandi* of the Canarese, is described by Elliot as being $10\frac{1}{2}$ inches long, of which the head and body measure $6\frac{2}{3}$, and the tail $4\frac{3}{10}$, whilst the head is only $1\frac{1}{10}$ in. It is of course possible that these measurements were taken from a stretched skin, and that of the tail agrees fairly with the form above described, though its proportion to the body appears very different. But there are other distinctions: the ears are said to be villose, and although the fur is not described, a preliminary list of the species of rats and mice‡ in the South Mahratta country is given, in which the following are classed as having tuberculated molars and soft hairs—*Mus decumanus*, *rattus*, *mettade (lanuginosus)*, *golundee* (*hirsutus*), *oleraceus*, *rufus*, and *musculus*—and opposed to *M. platythrix* and *M. Boodaga* said to have tuberculated molars and to be covered with hair and spines.

The original description of *Golunda Ellioti*, Gray,§ like too many of that author's descriptions, is quite insufficient for determination. Not a word is said of flat hairs: the fur is described as "pale brown, with minute very slender, hair pointed black tips." The ears are said to be "covered with short hairs." No dimensions are given. The description is included in a paper entitled "Description of some new or little-known Mammalia, principally in the British Museum Collection." In the list of Mammalia in the British Museum, p. 113, the only specimen of *Golunda Ellioti* mentioned is stated to be from Madras and to have been presented by Walter Elliot, Esq. In this list *Mus hirsutus*, Elliot, is identified with *Golunda Ellioti*. It is to be noted that in the original description of *Golunda Ellioti* the habitat was said to be Bombay. Without consulting the British Museum specimens it is impossible to say whether the specimen presented by Mr. Elliot was the original type or not, but to judge from the name it probably was, so that there can be very little doubt of the

* Prod. Faun. Zeyl., l. c.

† Mad. Jour. Lit. and Sci. X, p. 213.

‡ *Ib.*, p. 208.

§ Charlesworth's Mag. Nat. Hist. I, p. 586.

identification of *Mus hirsutus* with *Golunda Ellioti;* and as the skin sent from Madras by Mr. Elliot as a specimen of the *Gulandi* is identical in species with the Ceylon coffee-rat, as well as with the specimen from Sind, there is no choice but to follow Mr. Blyth and consider all as belonging to one species, until the types can be compared.

Judging by the description alone, I should have thought the coffee-rat agreed much better with the description of *Mus platythrix*, Bennett, which is described as having flattened spines, naked ears, and the tail nearly as long as the body. The dimensions are smaller: head and body 3¼ inches, tail 3; but the proportions and colouration agree, and the type may not have been full grown. This form, however, is, by Elliot, identified with the *Leggyade*, an animal of very different habits from the *Gulandi*.

The question of synonymy must, therefore, be deferred. Meantime, the identification of an Indian rat with the African genus *Pelomys* is of some importance as adding another to the number of generic forms common to India and Africa, but not known to be represented to the eastward.

Pelomys fallax resembles *Golunda Ellioti* in colouration, general form, and dentition, but it differs widely from it in its other characters and in its habits. It is a much larger animal, the adult being about 300 millemetres [12 inches] long from nose to end of tail. It has a differently shaped head,* with the ears much smaller in proportion; the fur of *Pelomys fallax* is simply described as harsh and finely bristly *(hart und feinborstig)*, so that it probably presents none of the remarkable characters found in *Golunda Ellioti*. *P. fallax* is said to be found in marshy places, whilst *Golunda Ellioti* inhabits bushes on hill-sides.†

P. S.—Since the above was in print, I have received from Mr. Fairbank a specimen of the true *Gulandi*, brought to him at Ahmednagar by men of the Wadari or tank-diggar caste, the very people from whom Sir W. Elliot appears to have procured his specimens. These people hunt and eat rats and necessarily know all the species. The animal sent, an adult female, is specifically identical with the Sind rats and with those from Southern India and Ceylon, so there can no longer be a doubt as to the propriety of referring all to *Golunda Ellioti*. The face is not so convex as in the figure attached to this paper. The measurements are:—

* In the accompanying figure taken from the specimen in spirit after the skull had been extracted, the convexity of the face is much exaggerated. This is the form of the young animal only, I think. The head in the adult is very slightly convex.

† Whilst this paper was passing through the press, I also received from Mr. Fairbank specimens of the *mettad*, *Golunda meltada*, Gray, obtained at Ahmednagar. They differ so much from *G. Ellioti* that I doubt if the two forms are congeneric. In *G. meltada* (potius *mettada*) the incisors are not sulcated, the molars differ but little from those of *Mus*, and the palate is much broader than in *G. Ellioti*.

	in.
Length from nose to insertion of tail, ...	4·75
„ of tail, ...	4·
„ of hind foot, ...	0·92
„ of ear from orifice, ...	0·6

A specimen of a rat obtained by Mr. V. Ball in the Sátpura Hills and presented by him to the Indian Museum, also belongs to this species.

EXPLANATION OF PLATE X.

Fig. 1. Head of *Golunda Ellioti*, Gray, from Sind (the face is represented much too convex). 2. Right hind-foot. 3. Right fore-foot (the intermediate tubercle should have been drawn further away from the posterior (proximal) pair). 4. Under view of the skull. 5. The skull and mandible, seen from the side. 6. Upper view of the skull. 7. Incisors, seen from the front. 8. Molars of upper jaw, right side. 9. Do. of lower jaw, right side.

XII.—*On the* Cyclostomacea *of the Dafla Hills, Assam.*—*By Major* H. H. Godwin-Austen, *F. R. G. S., F. Z. S., Deputy Superintendent Topographical Survey of India.*

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(With Plates VII & VIII, A, Figs. 1—6.)

The expedition into the Dafla Hills in the winter of 1874—75 has added very largely to our knowledge of the land-shells of that part of India. The line of the Himálayas has been very well worked up to the neighbourhood of Darjiling, and the researches of the Messrs. Blanford and the late Dr. Stoliczka have left I suspect very few forms undiscovered in that quarter, but from thence to the Dafla Hills, a distance of 270 miles, we had received nothing, so that when I found myself deputed for survey duty in these more eastern hills, I anticipated a goodly haul of molluscan forms, and am glad to say I have not been disappointed. The present list is confined to the operculated group, numbering some 33 species; of which 11 are new; 5 had been originally described from Darjiling and have their range thus extended far to the eastward; 13 are well-known forms in the Khasi and Naga hill-ranges south of the Brahmaputra River; and 3 or 4 are known to extend thence to the Shan States in the Irrawaddy drainage-system. The list of *Helicidæ* will be given in a second paper, in the prepa-