

## X. NOTES ON SOME HARES IN THE INDIAN MUSEUM WITH DESCRIPTIONS OF TWO NEW FORMS.

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I owe to the authorities of the Indian Museum the opportunity of examining a number of the hares in their collection and while studying the material lent me have put together the following notes. Unfortunately many of the skins are old and deteriorated and in some instances the skulls are very imperfect so that many features are obscured: but on the other hand little detailed information seems to have been published about the hares of the Indian Empire and many of the older descriptions are very sketchy according to modern ideas.

Though I think but little weight can be attached to the form of the cement groove, or enamel folding, of the upper incisors except for broad distinctions I have described and figured all the examples in the present series. Forsyth-Major states:—"Specimens of the same species may vary slightly owing partly to individual variation. But the shape of the enamel fold varies equally at different stages in the age of the animal; species whose incisors show the most complicated pattern in the adult have as yet no trace of this in very young animals; and *vice versâ* in very old specimens complication tends to disappear again." (*Trans. Linn. Soc. Zoology*, 2nd Ser., VII, p. 466; 1899.)

The examination of a sufficient series from one place (which is required in order to show what the degree of variation is) still remains to be made, but judging from a set in my possession of *Lepus siamensis*, Bonhote, obtained from localities in North, Central, Eastern and South-Western Siam,—even after making allowance for age—species or races seem to have an incisor groove only definable within wide limits: *L. siamensis*, for instance, possesses a furcate groove but the number and shape of the branches are very variable.

As regards hares of the Indian Empire those with some form of triangular groove only occur just within northern limits and the branched-grooved group includes the majority of its forms; for though in one or two of those examined the groove is squarish, in them the branches have probably aborted. The present series does not show any gradation or connection between the furcate and triangular forms of groove and these two patterns seem of value for grouping purposes.

It has seemed most convenient to deal with the material geographically beginning with the north-western races. Two new forms are described.

### ***Lepus yarkandensis.***

Günther, *Ann. Mag. Nat. Hist.* (4), XVI, p. 229 (1875).

No. 3782. Sub-adult skull from Katti-ilik, Fyzabad, Eastern Turkestan (F. Stoliczka coll.). Upper incisors with the grooves triangular

in section and well filled with cement (fig. 1): very like those of "*Lepus yarkandensis?*" from Koko Nor figured by Forsyth-Major (*Trans. Linn. Soc., Zool.*, 2nd Ser., Vol. VII, p. 468, fig. vii; 1899); and another specimen from Eastern Turkestan figured by Lyon (*Smithsonian Miscellaneous Collections*, Vol. XLV, p. 351, fig. 8; 1904).

### **Lepus craspedotis.**

Blanford, *Eastern Persia*, II, p. 80, pl. viii.

No. 1322a. Nearly adult female (skin and skull) from Pishin, Baluchistan (W. T. Blanford coll.). Type of *L. craspedotis*.

Pelage very soft, apparently greyish-buff speckled with blackish, the rump greyest; a pale area about the eye; nape fulvous. Forelimbs brighter and more ochraceous than the body; hind-feet whitish or buffy white above, ochraceous below. Tail clear black above, ungrizzled. Underparts white except the foreneck which is fulvous; lower abdomen clad with long hair. Ears apparently very large with a long fringe of hair along their upper edge. Groove in upper incisors in shape a rather acute isosceles triangle about half filled with cement (fig. 2).

The skulls of this animal and of *L. yarkandensis* (No. 3782 *antea*) differ from all the following in the relative narrowness of their palatal bridges and in the large size of their bullae, those of *L. yarkandensis* being very big indeed, round and dilated; of *L. craspedotis* rather longer though not so broad but with even larger external auditory meatus: *craspedotis* has also rather larger palatal foramina and the anterior "foot" of the zygomatic arch is hardly expanded at all, while in *yarkandensis* the foot is smaller than in any of the following specimens.

Both have the nasals truncate posteriorly, those of *craspedotis* being quite square-ended, also its post-orbital processes are much larger, broader, and almost touch the frontals behind—often they probably do as there are distinctly rough-tipped projections on the latter bones which seem to indicate complete contact: in both species the processes are relatively larger than in any of the following.

### **Lepus dayanus.**

Blanford, *Proc. Zool. Soc.*, 1874, p. 663.

No. 1293b. Adult skin and skull from Nara-Nai Hills, west of Sehwan on the Indus, Sind (W. T. Blanford coll.).

Pelage harsher than *craspedotis* but not so harsh as in the following species: apparently agreeing with the description of the types of *dayanus* which came from Sukkur on the Indus, about 100 miles N. N. E. of Sehwan. Hairs of upper side of tail with dark bases almost concealed by fulvous tips.

The specimen is apparently a female as the lower abdomen is clad with very long hair.

Upper incisors with cement-grooves completely filled and almost square in section but the posterior border and the sides slightly concave and the corners rounded (fig. 3), less elongate than those of the cotype

figured by Forsyth-Major (*l. c. s.*, fig. xviii) and not so forked posteriorly.

The skull has considerably smaller bullae but larger palatal foramina than *yarkandensis* and *craspedotis*, with the palatal bridge a trifle broader: the inter-orbital width is greater; there is a well-developed anterior foot to the zygomata; the nasals are rounded posteriorly towards their outer sides and the post-orbital processes are joined to the frontals behind.

***Lepus cutchensis*, sp. nov.**

No. 9827. *Type*.—Nearly adult male (skin and skull) from Bhuj, Kutch, collected on 17th August 1911 by the Bombay Natural History Society's Mammal Survey. Original No. 401.

*Characters*.—Pelage very like that of *L. dayanus* from Sehwan but perhaps a little harsher; tail darker and less grizzled: bullae smaller. Skull like that of *ruficaudatus* in the broad sense, but pelage duller and tail dark.

*Colour*.—Upper parts a grizzle of pale buffy and dark brown, the former predominating, but distinctly greyish above the base of the tail. Limbs and top of muzzle ochraceous-buff, the hind feet rather paler above. Sides of muzzle and area about the eyes whitish; nape and foreneck nearly avellaneous-buff, not blackened. Throat, underside of body and tail and inner sides of thighs white. Hair beneath the digits of all limbs tawny. Ears finely grizzled buff and brown and edged with buff, the lower edge paler; the tips blackish posteriorly; the bases whitish below. Tail bone-brown above, slightly grizzled with ochraceous-buff.

*Skull and Teeth*.—Skull very like that of *ruficaudatus* (s. g.), having smaller bullae than *dayanus*, as small or smaller than *ruficaudatus*: palatal bridge broader but palatal foramina narrower than in *dayanus*, zygomatic feet equally developed; nasals similarly rounded posteriorly; inter-orbital breadth less; post-orbital processes considerably smaller and short, showing no sign of posterior contact with the frontals.

The grooves of the incisors, though of the same bifurcate pattern as in the cotype of *dayanus* figured by Forsyth-Major (*l. c. s.*, fig. xviii), have the branches longer and more distinct and more divergent; they are completely filled with cement (fig. 4).

*Measurements*.—Collector's external measurements:—Head and body, 415; tail, 80; hind foot, 101; ear, 93. For other measurements see table, p. 96.

***Lepus ruficaudatus*.**

Geoffroy, *Dict. Class. Hist. Nat.*, IX, p. 381 (1826).

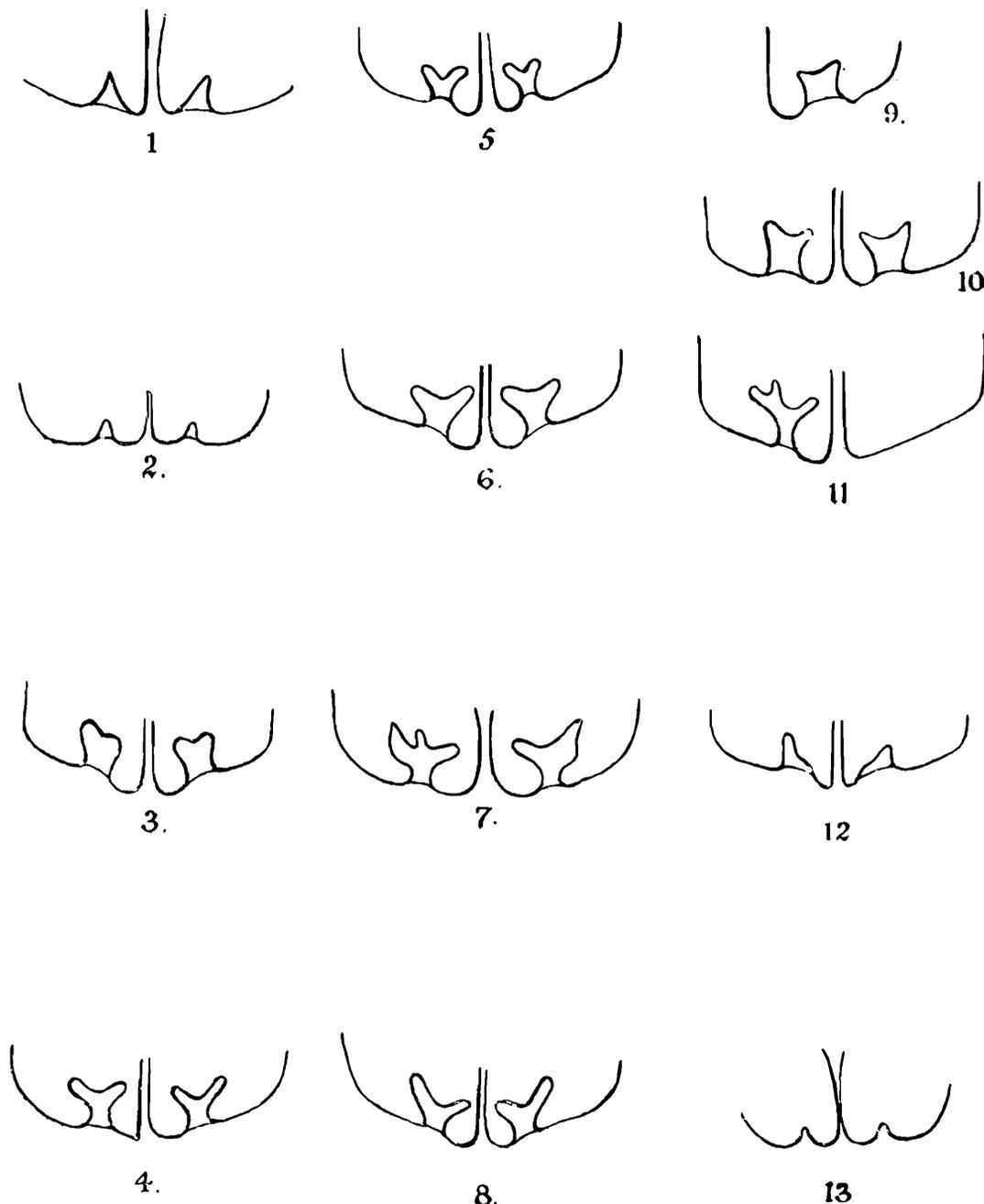
*Lepus macrotus*, Hodgson, *Journ. Asiat. Soc. Bengal*, IX, p. 1183 (1840) (Gangetic Plains and sub-Himalayas).

No. 10172. Adult skin and imperfect skull from Thankot, Nepal (J. Scully coll.).

Apparently a brightly coloured animal, ochraceous and black above, the lower portions of the limbs ochraceous to ochraceous-tawny throughout; the upper surface of the tail ochraceous, some of the

hairs tipped with black but all without dark bases. A pale patch in front of and about the eye. Ears apparently rather small.

The incisor grooves are of the same general form as No. 9827 (*L. cutchensis*); the principal difference being that the posterior edge is



Anterior end of upper Leporine incisors from below.  
(Enlarged : not to scale.)

- |        |                              |             |                             |
|--------|------------------------------|-------------|-----------------------------|
| Fig. 1 | <i>Lepus yarkandensis</i> .  | Figs. 5-10. | <i>Lepus ruficandatus</i> . |
| " 2.   | " <i>craspedotis</i> . Type. | Fig. 11.    | " <i>peguensis</i> . Type.  |
| " 3.   | " <i>dayanus</i>             | " 12.       | " <i>sadiya</i> Type.       |
| " 4    | " <i>cutchensis</i> . Type.  | " 13.       | " <i>sinensis</i>           |

sharply angular instead of regularly curved : the inner side of the tooth projects forward considerably so that the groove appears to be not fully filled with cement (fig. 5) : the molars are small.

Nasals short, irregularly rounded posteriorly, inter-orbital breadth small, palatal bridge of medium width.

The skull, though fully adult,<sup>1</sup> indicates an animal so much smaller than the last and following that, if typical, it might be regarded as sub-specifically distinct in which case Hodgson's name *aryubertensis* would apply (*Calcutta Journal of Natural History*, IV, p. 293—Nepal).

No. 10327a. Old mounted male from Agra District much faded and worn.

Tail ochraceous above throughout.

Upper incisors large, the groove bifurcating fairly regularly, the posterior edge concave, branches of medium length, stem moderately broad (fig. 6).

No. 7244. Adult skin and skull from Gaya District, Bihar (F. Field coll.).

Colour less bright than the Nepal specimen, back and sides approaching buff; a considerable amount of whitish on the sides of the head; both sides of the hind feet also pale. Hairs of the upper side of tail ochraceous distally, dark brown basally.

Skull large, nasals somewhat rounded posteriorly, post-orbital processes of medium size and not touching the frontals behind: palatal foramina large and palate bridge broad, anterior feet of zygomata very large (12.5 mm. long).

Incisor grooves showing greater development than the last: the stem is narrower in proportion to the spread of the branches of which the right incisor exhibits two and the left three, the extra branch being median and small (fig. 7).

No. 10174b. Skin from Manbhum, Bengal (R. C. Beavan coll.).

In every way as brightly coloured as the Nepal specimen with the hairs of the upper side of the tail ochraceous throughout except for some dark tips. The hair below the digits is dark tawny, in marked contrast to the ochraceous limbs; but this feature is probably fortuitous.

No. 10328a. Skin from Manbhum, Bengal (R. C. Beavan coll.). As the last except that the hair beneath the digits is not dark.

No. 7317. Portion of skin with perfect skull from Calcutta.

The fragmentary skin indicates an animal nearly as bright as the Manbhum individuals.

Skull with nasals pointed posteriorly, and rather small post-orbital processes not approaching the frontals. Palatal bridge narrow with a posterior median spine, mesopterygoid space broad, bullae like the last but more globose; molars small.

Incisor grooves bifurcating with well developed branches completely filled with cement (fig. 8): Very like those of a specimen from the Jumna River figured by Lyon (*l. c. s.*, fig. 10) but branches more elongate.

*Lepus ruficaudatus* seems to be a species in which the incisor grooves are normally bifurcate but also develop three and four branches as in the animals from the Punjab and Rajputana figured by Forsyth-Major (*l. c. s.*, figs. xxiii and xxiv): for Punjab material the name *kurghosa* has apparently been proposed by Gray.

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<sup>1</sup>Specimens are here regarded as fully adult when the frontal suture is largely obliterated: otherwise they are called nearly adult or sub-adult.

No. 10004. Adult skin and imperfect skull from Satpara, Puri District, Orissa (S. W. Kemp coll.).

Colour not markedly differing from the Gaya example (No. 7244) with muzzle and top of head ochraceous but the sides of the head and hind feet less white. Hairs of upper side of tail ochraceous distally, greyish-brown basally.

Skull large with the nasals broadly rounded posteriorly, palatal bridge narrower than in No. 7244.

The groove of the right incisor (left missing) well filled with cement, of simple form almost square in section, the posterior angles projecting very slightly (fig. 9).

No. 10173. Nearly adult skin and imperfect skull from the Naga Hills, Assam (A. W. Chennel coll.).

Colour like the last but a little less bright. A ring round the eye buffy instead of whitish : hairs of upper side of tail without dark bases.

A smaller skull than the last with the nasals narrower posteriorly, frontals much narrower and narrower palatal bridge.

Incisor grooves of essentially the same type but their posterior angles sharper and more projecting (fig. 10).

The difference between this individual and the last does not appear to be great and the incisor grooves are similar. If the latter were typical Tytler's name *tytleri* (*Ann. Mag. Nat. Hist.* (2), XIV, p. 176; 1854) based on material from Dacca, an intermediate locality, might possibly apply. But the presence of the above recorded specimen No. 7317 from Calcutta (fig. 8), also an intermediate locality, renders such a course impossible until more is known of the hares ranging from the Bengal Coast to Assam. It is of course highly probable that the Calcutta specimen was obtained in the Bazaar and came from up-country.

### **Lepus peguensis.**

Blyth, *Journ. Asiatic Soc. Bengal*, XXIV, p. 471 (1855).

No. 435a. Mounted skin and imperfect skull (scarcely fully adult) from Upper Pegu (Sir A. Phayre coll.). Type of *L. peguensis*.<sup>1</sup>

The skin has suffered much from exposure but exhibits clearly the white upper surfaces of the hind metapodials and small pale patches on the forefeet ; and also the pure dark upper surface of the tail (now altered to " seal brown ").

Nasals pointed posteriorly, frontals broad, post-orbital processes not touching behind ; palatal foramina broad, palate bridge medium.

Groove of left incisor (right damaged) very similar to those figured by Forsyth-Major (*l. c. s.*, fig. xx), consisting essentially of a two-branched groove with the outer branch bifurcating and the stem fairly narrow : well filled with cement (fig. 11).

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<sup>1</sup> The first example of *L. peguensis* seen by Blyth and recorded as identical with *sinensis* Gray (*Journ. Asiat. Soc. Bengal*, XXI, 1852, p. 359) was a hare from Arakan : it was evidently not made the type of the species for its ears had been destroyed whereas in the present specimen they are perfect, and there is no black on the underside of the paws as was stated to be the case with the first animal.

**Lepus sadiya**, sp. nov.

*Lepus* sp., Robinson, *Rec. Ind. Mus.*, VIII, p. 90 (1913).

No. 9165. *Type*.—Adult skin and skull from Kobo about 15 miles west of Sadiya, N.-E. Assam. Collected during the course of the Abor Expedition by Mr. S. W. Kemp.

*Characters*.—Pelage somewhat as in *L. peguensis* Blyth, with metapodials of hind feet whitish, but colour generally paler and duller, and tail suffused with ochraceous. Grooves of incisors roughly triangular.

*Colour*.—Upper parts mingled buff and black, top of face tinged with ochraceous, sides of head rather paler buff, some white on the sides of muzzle and areas round eyes, sides of body buffy-white with a few black tips to the hairs. Nape ochraceous-tawny slightly grizzled with black. Fore-limbs ochraceous-buff; forefeet dull buff above with a few white hairs above the claws, below greyish-buff; hind feet white above with some buff hairs over the digits, below and at sides greyish-buff. Tail above superficially ochraceous but the hairs with dark brown bases ("seal brown") most visible near the tip: throat, under parts of body, back of fore-limbs, front and inner aspect of hind-limbs and under-surface of tail white, gradually blending on the under-body with the colour of the sides. Extremity of chin grey; fore-neck like the fore-limbs, the hairs faintly tipped with black. Ears finely grizzled blackish and buff, the former in excess; the edges fringed with buff except the tip externally which is brownish-black.

*Skull and Teeth*.—Skull rather smaller than the type of *peguensis*, the posterior termination of the nasals rounded; frontals narrower and post-orbital processes larger, not, however, touching the skull behind. Palatal foramina relatively narrower, palate bridge broader with a pronounced posterior spine, mesopterygoid space very narrow; anterior feet of zygomata moderate; bullae about as in *ruficaudatus* (they are missing in the type of *peguensis*).

Incisor grooves triangular (thus approximating towards *sinensis*, Gray) but well filled with cement and the inner borders slightly sinuate; inner side of incisor very narrow and projecting considerably (fig. 12).

*Measurements*.—See table, p. 96.

*Remarks*.—I have no skins of *Lepus sinensis* or other Chinese hares to compare this animal with, but judging from descriptions it is quite distinct. While the shape of the incisor groove shows that it is allied to the northern animals the white hind-feet connect it with *peguensis*.

**Lepus sinensis**.

Gray, *Ill. Ind. Zool.*, II, pl. xx (1834).

No. 436c. Imperfect skull of young adult from Amoy, South China.

Skull small, rostrum slender, nasals obliquely truncate, frontals broad, post-orbital constriction narrow; palatal bridge relatively broad and mesopterygoid space wide.

Incisor grooves triangular much as figured by Forsyth-Major (*l. c. s.*, fig. vii) but with less cement therein, the groove being practically empty except at the extreme apex (fig. 13).

No.	Name.	Hind-foot. s. w.*	SKULL.										
			Greatest length.	Basilar length.†	Dias-tema.†	Upper molar row (alveoli).	Palatal bridge, least breadth.	Mesop-terygoid space, least breadth.	Diagonal length of nasals.	Anterior frontal constriction.	Posterior frontal constriction.	Zygomatic breadth.	
3782	<i>Lepus yarkandensis</i> , Gthr.	..	78.0	61.0	22.0	14.0	5.2	7.2	39.3	16.0	14.0	37.0	Sub-ad.
1322a	„ <i>craspedotis</i> , Blanf. Type	106	80.0	64.2	23.0	15.0	5.0	7.0	31.0	15.5	11.0	39.0	Sub-ad.
1293b	„ <i>dayanus</i> , Blanf.	95	84.0	66.0	24.8	15.1	5.8	6.8	36.6	18.0	12.2	36.6	Ad.
9827	„ <i>cutchensis</i> , mihi. Type	101	86.2	66.5	23.0	16.1	7.0	6.6	38.8	15.5	12.1	38.2	Sub-ad.
10171	„ <i>ruficaudatus</i> , Geoffr.	90	..	60.0	22.8	14.0	6.2	6.1	..	16.0	12.1	38.2	Ad.
7244	„ „ „	101	92.0	73.0	28.0	17.0	8.0	7.5	44.0	19.3	13.8	41.5	Sub-ad.
7317	„ „ „	..	88.8	68.0	26.0	15.7	5.0	8.1	40.0	17.2	12.0	40.8	Ad.
10004	„ „ „	..	..	69.5	27.1	16.0	6.7	7.4	40.2	19.0	..	± 39.5	Ad.
10173	„ „ „	103	..	..	24.5	15.0	5.5	5.8	..	15.7	13.7	39.0	Sub-ad.
435a	„ <i>peguensis</i> , Blyth Type	100	89.0	..	27.0	16.3	7.0	6.7	42.5	17.5	14.8	..	Sub-ad.
9165	„ <i>sadina</i> , mihi. Type	88	83.0	65.0	24.0	16.4	7.1	4.9	40.5	15.3	12.0	37.7	Ad.
436c	„ <i>sinensis</i> , Gray	..	..	..	22.1	16.0	6.2	6.7	39.2	17.2	11.8	37.7	Sub-ad.

\* From dried skin.

† From back of large incisor.