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Description of a skin resembling *Hippotigris zebra frederici* Trouess. from the collection of the Polish Museum of Zoology at Warszawa.

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ADOLF RZAŚNICKI.

Opis skóry zbliżonej do *Hippotigris zebra frederici* Trouess. ze zbiorów Państwowego Muzeum Zoologicznego w Warszawie.

Description of a skin resembling *Hippotigris zebra frederici* Trouess. from the collection of the Polish Museum of Zoology at Warszawa.

[Pl. VIII—IX].

In the Supplement to his Catalogue of 1904 E. L. Trouessart records under № 6792a a new subspecies of the mountain zebra: „*zebra frederici*, Colonia Cap., sept. (extinctus)“.

This subspecies has been established upon the description and the drawing by Frederic Cuvier of a female zebra (zèbre femelle) which lived some hundred years ago in the Jardin des Plantes; it originated from the Cape Colony.

So far it is possible to judge from the works of F. Cuvier, Ewart, Trouessart, Griffini and Zukowsky, as well as from the drawing given by F. Cuvier, this form resembled closely *Hippotigris zebra zebra* (Linn.) and possessed the following characters.

Stripes black on yellow ground. The first four body stripes reach the „ventral profile“ becoming narrower and paler at their ends; the remaining body stripes end shortly on the flanks. Hind ends of the hindquarters stripes directed more upwards. The lines of the gridiron pattern join the stripe which runs from the inguinal region to the root of the tail. The stripes of the face

are rather irregular. The light space between the stripe running at the base of the ear and the dark spot on the outer ear side is small. On the neck ten stripes „narrower than the pale stripes of the ground colour“ (according to the drawing there are nine stripes or thirteen if all bifurcations are counted). On the body, between the shoulder stripe and the stripe bordering the gridiron pattern (including this last) eleven stripes are found. The stripes crossing the hindquarters are as wide as the light intervals of the ground colour lying immediately below them. Tail distinctly striped, the prolongation of the dorsal stripe disappears about its middle part. The peculiar dewlap-like flap of skin under the throat strongly developed. Other characters, such as the type of the disposition of the stripes, the shape of the body, the short mane etc., as in all mountain zebras.

The Polish Museum of Zoology possesses a stuffed skin of a 3–4 months old foal of a mountain zebra, which has been purchased, together with other collections in 1818 from Baron Minkwitz from Grunwice in Silesia.

In a handwritten „Catalogue of Vertebrates of the Zoological Cabinet at Warszawa“ compiled in 1863 by W. Taczanowski this specimen is listed as „*Equus zebra* L. South Africa. Very young“. In 1863 only three forms of zebras were known, viz.: *E. zebra* Linn., *E. burchelli* Gray and *E. quagga* Gm. The subspecies of *Hippotigris zebra* have not been established yet. Thus, according to its general characters the specimen here in question has been quite correctly referred by Taczanowski to the species „*Equus zebra*“.

The skin is rather damaged, badly stuffed, without skeleton and skull. The shape of the animals body is therefore scarcely preserved. In consequence of its age and a long exposition to light the skin has considerably faded, the original coloration being, however, preserved on the neck in those places which are protected by the hair of the mane.

Description of the skin. Total length 116 cm, length of head 29 cm, height of the withers 67 cm.

Ears 12 cm long, pale cream-coloured, margined with brown; inwardly covered with short cream-coloured hair. Tips of ears pale without brown border. The outer side of the ear is crossed below the end by a wide (up to 5 cm) brown stripe,

pointed at its lower margin and emarginated at the upper one. Another narrower stripe (2 cm wide) begins at a distance of 1 cm from the root of the ear and runs obliquely upwards reaching the anterior ear margin. From this last stripe arise three or four paler finger-like lines; one of these is longer, directed upwards and more distinct, on the left ear it reaches the mentioned upper stripe, the remaining 2—3 are pale and run towards the posterior ear margin.

The mane begins at the crown of the head, extends over a distance of 40 cm and ends with a whirl of hair just behind the shoulder bones. The longest hair of the mane measures 5 cm. The middle part of the mane consists of reddish-brown hair (blackish-brown in less faded places). In the outer portion of the mane are found on every side 18 tufts of shorter, cream-coloured hair, which is distinctly yellow in places protected from fading. The yellow colour of this hair is particularly remarkable as even in the Southern forms of quaggas, with a yellow-brown ground colour, the pale hair of the mane is always white.

Muzzle shining brown with a golden shade. Nostril patches of the same colour. The lower ends of the face stripes join the nostril patches.

Ground colour, also on belly and legs, cream-yellow.

Stripes of the forehead chestnut-brown, on the cheeks darker. Neck stripes, although faded, darkest of all, yellowish-brown, under the mane, where the original colour is better preserved, bright blackish-brown. Stripes on body and hindquarters strongly faded, nut-brown in colour. On the legs the stripes are about the joints bright chocolate-brown, further below paler and more dim. The first four body stripes are in their lower portion more feebly marked, narrower, yellow in colour and join the yellowish-brown longitudinal ventral stripe.

Forehead with numerous, somewhat wavy stripes. On the temples are found on each side 6—7 stripes, which are directed with their upper ends towards the middle-line of the forehead. The facial rhomb is formed by 15 stripes partly bifurcated or, on the contrary, confluent with each other over some distance; some stripes touch the neighbouring ones only in single points. Width of the stripes unequal, from 1 to 7 mm, the median stripes on the nose are narrowest of all.

9—10 stripes extend between the angle of the mouth and the root of the ear, they form on the cheeks obtuse angles directed upwards. The sixth cheek stripe (counting from the front) bifurcates, borders the lower eyelid and extends with its anterior end to the nose. On each side of the chin three short lines. Beneath the jaw the stripes of one side join those of the opposite side and appear widest at these places. The greatest width of the cheek stripes equals 15 mm. The pale stripes of the ground colour are in the anterior part narrower, in the middle part about as wide as, in the posterior part distinctly wider than the dark stripes. The whirl of hair on the nose is situated on the level of the anterior eye angles.

On the crown of the head, between the ears two short stripes. Head separated from the neck by two narrow (5—6 mm wide) stripes.

On the neck 11 or 12 stripes on each side, often uniting one with another, especially so on the left side. Greatest width of the dark neck stripes 25 mm, of the pale stripes of the ground colour 12 mm. The first three dark stripes are narrower than the pale stripes. Near the mane the width of the first six dark stripes equals that of the pale ones. The dewlap-like flap of skin under the throat very large. At the junction of the second pectoral stripes of both sides begins the 1 cm wide longitudinal ventral stripe.

The shoulder stripes are similarly developed on both sides, in their lower part they are divided into three branches. Greatest width of the shoulder stripes equals 2,5 cm.

Hindwards of the shoulder stripe the back is crossed by 14 stripes of which on the right side the 5-th and 6-th, and the 8-th, 9-th, 10-th, 11-th and 12-th, and on the left side the 7-th and 8-th, and the 9-th, 10-th, 11-th and 12-th are united further below on the flanks of the body with each other. If we count therefore the stripes at the level of the middle line of the flanks, we find 10 stripes on the right side and 11 on the left. The greatest width of the body stripes equals 3 cm, while the pale stripes of the ground colour are from 15 to 16 mm wide.

The stripe which runs from the inguinal region to the root of the tail bordering the gridiron pattern is 2 cm wide. The pale stripe lying below it shows a width of 1 cm. The first stripe of

the hindquarters is 2–3,5 cm wide, and directed upwards with its posterior end. The pale stripe immediately below is 2,5 cm wide.

The second hindquarter stripe (up to 4 cm wide) has its posterior end also directed upwards. The corresponding pale stripe is by 1–2 cm narrower.

The third hindquarter stripe (2 cm wide) runs horizontally and is as wide as the pale stripe below it. Between the third hindquarter stripe and the crown of the hoof 20 stripes are found; these are at first as wide as the pale intervals between them, but about the hocks and further below they become wider, encircling the leg and partly confluent with each other. Inner side of hindquarters without stripes.

On the fore legs, below the bifurcation of the shoulder stripe 23–24 stripes are found; they are wide, encircling the leg, often confluent with each other and wider than the pale intervals between them. Many junctions of the stripes are seen especially when the leg is viewed from the front side. On the inner side of the leg, above the „knee“ the stripes run obliquely upwards, below the „knee“ their direction is opposite. The stripes of the hind legs are horizontal.

Chestnuts developed as large, naked patches of the skin ($4 \times 1,5$ cm) only on the fore legs. Hoofs narrow, their anterior height equals 2,5 cm. Hoof crowns chocolate-brown. Lower part of the pasterns uniformly brown, owing to the fusion of the stripes.

On the back, at a distance of 26 cm from the end of the mane a distinct whirl of hair is present. Along the median line of the back between the mane and the mentioned whirl the direction of the hair is reversed, the hair being inclined forward, while further backwards and also on the remaining parts of the body the hair shows a normal direction (backwards). Between the whirls the dorsal stripe is absent, as between the dark transversal stripes pale intervals are present, corresponding to the pale stripes of the ground colour. From the whirl of hair on the back till the tail the dorsal stripe is distinctly marked although narrow (about 0,5 cm wide). Behind the mane, over a distance of 8 cm the hair of the back forms a wavy line.

The gridiron pattern consists of 11 small stripes, which cross at right angles the longitudinal dorsal stripe and join, except

the 5-th and 6-th, on both sides the stripes running from the inguinal region to the root of the tail. The pale stripes of the gridiron pattern are about twice narrower than the dark ones; these latter become narrower posteriorly (from 19 down to 3 mm).

The skin possesses, unfortunately, only a portion of the tail. Along the dorsal line is visible a zigzag-like prolongation of the dorsal stripe of the back. The transverse stripes (4 mm wide) resemble in their configuration a pattern of „flying birds“ (applying the expression used by Zukowsky).

The exact identification is not without difficulties arising in connection with the young age of the specimen and the strongly faded state of the skin.

Of course, in identifying the skin described above we can take under consideration only the species *Hippotigris zebra*, which is now usually divided into the following three or four subspecies:

1. *H. zebra zebra* Linn. 1758.
2. *H. zebra frederici* Trouess. 1904.
3. *H. zebra hartmannae* Matsch. 1898.
4. *H. zebra penricei* Thos. 1900.

As it is practically impossible to conclude from the descriptions given by Matschie and O. Thomas, what consists the exact difference between their forms, most authors (Trouessart 1904, Schwarz 1912, Griffini 1913, Blaine 1922) consider *H. zebra hartmannae* as synonymous with *H. z. penricei*. Only Zukowsky regards these two forms as distinct, although he does not indicate any discernible differences between them. The opinion of Zukowsky is based upon the theoretical view that *H. z. penricei*, which is known from the Northern margin of the Kunene, must represent a subspecies distinct from *H. z. hartmannae* which inhabits the region to the South of that river, a region characterized in general by a specifically different fauna.

The paper of Zukowsky (1924) added to the subspecies of mountain zebras a new form *H. hartmannae matschiei* from Kaoko-Veld, which is considered by its author as a subspecies of the species *H. hartmannae*, this latter being looked upon by him as of equal taxonomic value with, and specifically distinct from *H. zebra* Linn.

The subspecific differences of the mentioned forms consist chiefly in the different ground colour and partly also in the different colour of the stripes, as well as in the different width and number of these.

H. zebra zebra differs from *H. zebra frederici* by its white ground colour, by the less numerous and more regular stripes on the nose; the facial rhomb consists in *H. zebra zebra* of 10–11 stripes (in the specimen described above 15 stripes of an irregular course). In *H. zebra zebra* all the body stripes end shortly on the flanks, in *H. zebra frederici* the first four „reach the ventral profile“ (on the skin described above they even join the ventral stripe). The stripes of the hindquarters form in *H. zebra zebra* evenly rounded arches, in *H. zebra frederici* the posterior ends of these stripes are directed upwards. In *H. zebra frederici* the stripes are even on the neck narrower than in *H. zebra zebra*.

From *H. zebra hartmannae* (or *H. zebra penricei*) and from „*H. hartmannae matschiei*“ *H. zebra frederici* differs by its uniformly creamy-yellow ground colour; in *H. zebra hartmannae* and „*H. hartmannae matschiei*“ the yellow colour is visible only on the head, on the neck on the back and on the flanks, the legs and the belly being white. In these forms none of the body stripes reaches the ventral profile. The neck stripes are in „*H. hartmannae matschiei*“ wider than in *H. zebra hartmannae* and in *H. zebra frederici*. The stripes of the hindquarters are in *H. zebra frederici* of about the same width as the pale intervals of the ground colour, in *H. zebra hartmannae* and „*H. hartmannae matschiei*“ they are much narrower than the pale intervals lying below them and show a similar course as in *H. zebra zebra*. The posterior stripes of the gridiron pattern do not join in *H. zebra hartmannae* and „*H. hartmannae matschiei*“ the oblique stripe bordering the gridiron, besides that these stripes are in „*H. hartmannae matschiei*“ pale and become ill defined. In *H. zebra frederici* the pale space between the base of the ear and the lower ear stripe is small, in „*H. hartmannae matschiei*“ it is very large. The facial rhomb consists in *H. zebra hartmannae* of 13–16 stripes, in „*H. hartmannae matschiei*“ of 10–11 as in *H. zebra zebra*. According to Blaine, the tips of the ears are dark in *H. zebra hartmannae*.

H. zebra frederici could be compared finally with the so called Ward's zebra (Ewart 1904) which is, however, a specifically doubtful form, being perhaps a bastard of the mountain zebra and the quagga (Chapman's?) (Pocock, Ridgeway, Ewart). Ward's zebra differs from *H. zebra frederici* by the very wide longitudinal dorsal stripe, as well as by the lack on the back of hair inclined in the reversed manner. It should be mentioned also that on the photograph of Ward's zebra, given by Ewart, fairly distinct shadow stripes are visible on the hindquarters.

The number of body stripes does not offer a constant character even within the limits of a single subspecies, as the junctions of these stripes are frequently subjected to individual variation. As a rule, however, it is smallest of all in *H. zebra zebra*, largest in *H. zebra hartmannae* and „*H. hartmannae matschiei*“. As it can be seen from the figure given by F. Cuvier *H. zebra frederici* should have 11 body stripes, if counted on the level of the middle line of the flanks.

The width of the neck stripes is larger in the specimen here in question than it should be in accordance with the authors, it must be, however, mentioned that on the figure given by Cuvier the width of the dark stripes is also not smaller than that of the pale ones. If we consider further that on all the older figures of zebras, as it has been shown by Schwarz, the neck stripes are always marked too narrow, we could suppose that Cuvier's figure does not form an exception in this regard.

A difference in the colour of the stripes, which are brown instead of black, as they are supposed to be in *H. zebra frederici*, may depend in the skin here in question on the very young age of the animal and on the state of fading. Besides that, Antonius has shown that the season has an influence upon the change of colour of the stripes in mountain zebras, the dark hair assuming for winter a reddish-brown shade.

On the base of: 1) the yellow ground colour, 2) the first four body stripes reaching the ventral one, 3) the greater number and irregular course of the nose stripes, and 4) the posterior ends of the stripes of the hindquarters directed upwards, (although somewhat less than on the figure of Cuvier), as well as the number of neck and body stripes corresponding more or

less with Cuvier's figure, I am inclined to consider the specimen described above as belonging to the form, named by Trouessart *H. zebra frederici*.

The Zoological Museum of the University of Berlin possesses, as I have learned through the kindness of Dr. E. Schwarz, a skin of a zebra which lived till 1907 in the Zoological Garden at Berlin. This skin resembles in the length of the first four body stripes the specimen described above.

Dr. Schwarz identifies it, however, as *H. zebra zebra* and lets me know his following opinion in a letter dated April 18-th, 1930: „*H. z. frederici* Trouessart ist sicher ein Synonym zu *H. z. zebra* L. Die geringfügigen Abweichungen der Tafel, auf die es begründet ist, von einem Exemplar, das Ihnen vielleicht vorliegt, fallen gewiss in das Gebiet der individuellen Variation, wie sie alle Tigerpferde in hohem Masse zeigen und wie sie auch bei *hartmannae*, mit dem Zukowsky's *matschiei* identisch ist, vorkommt“.

One of the skins of *H. zebra hartmannae* described by Schwarz showed also body stripes reaching the ventral stripe.

In view of these facts it would be really perhaps most justified to suppose that the extension downwards of the body stripes shows in mountain zebras individual variation. The question of subspecific distinctness of *H. zebra frederici* has to remain thus open for the moment. I have no intention also to decide at present whether Zukowsky's form is distinct from *H. zebra hartmannae* or identical with it, as Schwarz is thinking. I would like to state only that the conjointness of differences in colour and disposition of stripes in the specimen here in question, if compared with such doubtless subspecies as *H. zebra zebra* and *H. zebra hartmannae*, permits to consider it as very close to the form named by Trouessart *H. zebra frederici*, and admitted as distinct by several authors.

In any case, the above specimen which would belong thus to a subspecies long since extinct deserved, as I think, a detailed description.

EXPLANATION OF PLATES VIII — IX.

- Pl. VIII. Fig. 1. *Hippotigris zebra frederici* Trouess. From the coll. of the Pol. Mus. of Zool. Head.
- Fig. 2. *Hippotigris zebra zebra* Linn. Head. (after W. K. Gregory, Bull. N. Y. Zool. Soc.).
- Pl. IX. Fig. 3. *Hippotigris zebra frederici* Trouess. (after F. Cuvier's original figure, from Griffini „Le Zebre“).
- Fig. 4. *Hippotigris zebra frederici* Trouess. From the coll. of the Pol. Mus. of Zool. Back.
- Fig. 5. *Hippotigris zebra frederici* Trouess. Idem. Side view.
- Fig. 6. " " " " " Head and neck.
- Fig. 7. " " " " " Anterior part of body seen obliquely from beneath, notice prolongation of first four body stripes.

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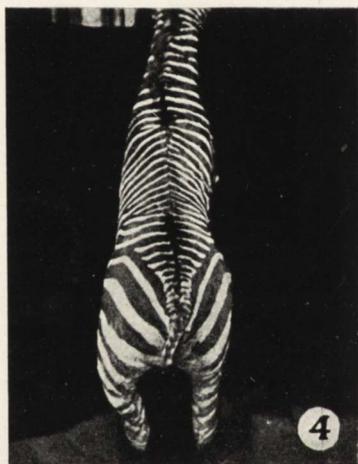
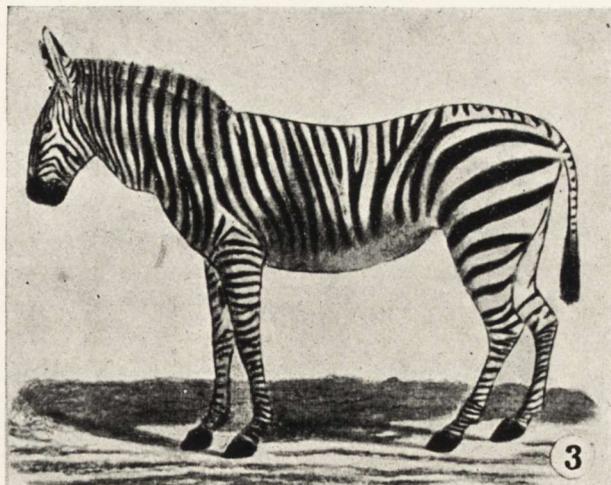
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STRESZCZENIE.

Autor opisuje skórę źrebięcia zebry górskiej, znajdującą się w zbiorach Państwowego Muzeum Zoologicznego w Warszawie, dochodząc do wniosku, że możnaby ją zaliczyć do formy nazwanej przez Trouessart'a (1904) *Hippotigris zebra frederici* i uważanej przez niektórych autorów za podgatunek odrębny, dziś już zresztą wytępiony. Skóra pochodzi z dawnych zbiorów barona Minkwitz'a, zakupionych w r. 1818.



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